Med. Forum, Vol. 22, No.1 January, 2011 **ISSN 1029-385-X**

Recognized by PMDC **Recognized by HEC**

CONTENTS

Editorial

How to Prevent Swine Flu

Dr. Azhar Masud Bhatti
A. Director Health Services, EPI Punjab, Lahore
&
Editor in Chief

January is the peak season for swine flu. There are four basic subtypes of this flu — H3N2, H3N1, H1N2, and H1N1. Swine influenza is an infection of the respiratory tract caused by a type of virus that is endemic and common in pigs worldwide. Influenza A causes acute sickness and serious complications sometimes leading to death. The flu is transmitted from an infected animal to an uninfected animal through direct contact and can increase through intensive fanning. People who work with poultry or swine are at an increased risk, such as cattle farmers, veterinarians and meat processing workers.

The symptoms of the disease include fever, sore throat, runny nose, lethargy, pressure in chest, rapid breathing, bluish or grey skin colour, low blood pressure due to dehydration, no desire of liquid intake, dizziness and confusion, very high body temperature and respiratory failure, lack of appetite, coughing, nausea, vomiting and diarrhea. The virus is spread through migrants and is extremely transmittable. The symptoms are comparable to the common flu and therefore often create confusion in diagnosis. Signs of a more serious swine flue infection may include pneumonia and respiratory failure.

The disease is not very dangerous and can be easily controlled in early stages. At present we do not have a good surveillance system at our airports, ports or borders to check the entrance of swine flu virus carriers. We need to establish a good system because the epidemic is very much present in our neighboring countries. In previous year, 600 people have died of swine flue only in India, 300 in China, 140 in Iran and 15 in Afghanistan. 159 deaths occur in Mexico and 1300 people admitted in hospitals of Mexico upto 29th April 2009.

In 2009, WHO has declared the flu a “Public Health Emergency of International Concern” that could become a pandemic or global outbreak of serious disease.

In Pakistan, according to National Institute of Health (NIH), about 100 people have been tested positive for H1N1 virus in this winter. However, the NIH officials believe the situation is under control. Maximum numbers of cases have been reported in Punjab (32), followed by Sindh (29), KP (15) and 24 from other places of the country.

The H1N1 virus does not survive cooking temperatures of 71^{0}C or more. Nonetheless, like all other viruses it can adapt to different environments, evolving through gene modification. H1N1 is the same strain which causes the common cold but the latest version has evolved into a wholly human disease now, which can spread among people through coughing and sneezing. Over-crowding, moving in public places and sharing a room with many family members increase the risk.

Sindh Health Minister Dr. Sagheer Ahmed had recently inaugurated the Sentinel Influenza Surveillance Laboratory and the Medical Out-Patient Department at Civil Hospital Karachi (CHK) with the help of international donor agencies. The centre will provide treatment for viral diseases in the province, including swine flu. It has a special H1N1 Surveillance Cell. Dr. Sagheer Ahmed had promised to activate the lab and give accurate results, but conceded that natural disasters like the recent floods have taken a toll on the national exchequer leaving little to be spent on health and development.

"According to international recommend-ations, we are required to closely watch the behaviour of the virus. For laboratory-based surveillance of seasonal influenza virus, Pakistan has a robust laboratory network consisting of an apex laboratory at NIH, as well as one laboratory each at King Edward Medical College, Lahore, Civil Hospital, Karachi, Bolan Medical College, Quetta and Hayatbad Medical Complex, Peshawar. Two more laboratories will be set up in Gilgit and Muzaffarabad in collaboration with the Centres for Diseases Control, Atlanta," says Executive Director of NIH Dr. Birjees Mazhar Qazi. Children, pregnant women, old and those who are already ill are more vulnerable. It is, therefore, important for health departments of all the provinces to run public awareness campaigns, especially for the vulnerable groups, which deal with animal fanning.

"During the high transmission season, samples will be collected from the OPDs of hospitals under standardized SOPs to determine the range of the circulating influenza virus. It will also enable us to study the characteristics of last year's pandemic strain and to detect any possible changes. Vaccination is an important tool for self-protection. Seasonal flu vaccine is now available in Pakistan."

The examples of two studies given below:-

According to the study, a FINNISH research has presented promising data that may show the effectiveness of flu vaccines for younger children, which they hope will prompt countries to immunize children between the ages of six and 35 months.

The United States and Finland are currently among the few countries that recommend flu vaccination for children under two years of age. A non-randomized, prospective cohort trial found that the vaccine was 66% effective in children younger than three years old and that vaccination was not accompanied by adverse events. The trial was conducted during the 2007-2008 in flu season in Turku, Finland. This was the first year following the country's with a 0.5ml dose Universal flue vaccination recommendation for children between the ages of six to 35 months.

The flue vaccination was free at local health centers and was effective against influenza A/HINI and H3N2. though not as effective against the influenza B subtype, C1DRAP News reports. Effectiveness against type A was found to be 84%, while effectiveness against type B was 45%, according to the study.

Influenza type A or B was confirmed in 7 of 154 fully vaccinated children and was confirmed in 61 unvaccinated children in the study. Only four percent of vaccinated children under the age of two contracted the disease, while 12% of the unvaccinated children contracted either type of flu.

According to a new study reveals that men, but not women, vaccinated in the morning produced a better peak antibody response to both hepatitis A and the influenza strain. Led by Anna Catriona Phillips of the University of Birmingham, researchers assessed the response to a hepatitis A vaccine in young healthy adults and also examined responses to the annual influenza vaccination in older community-based adults. In the first study, 75 young participants were vaccinated with the hepatitis A vaccine during a morning session or early evening session. In the second study, 90 older adults attended their medical practice for the annual influenza vaccination and received the vaccination in the morning or in the afternoon. Man vaccinated in the morning showed the strongest immune response. Almost twice as many men showed a twofold increase in antibody response when vaccinated in the morning as opposed to the afternoon.

Fluarix, a vaccine, has been dubbed to protect people for almost a year and costs Rs500 to 600. Acetaminophen, a five-day course of anti-viral is also prescribed. It costs Rs2000 per course.

Health officials need to be deployed at international airports, seaports and border posts to screen suspected patients, install thermal scanners and provide pre-pandemic vaccine at hospitals. Children and adults with flu symptoms should refrain from attending educational institutes.

Expensive swine flu scanners were placed in Pakistan's major airports but most of them are not working now. Isolation wards need to be set up and vaccines need to be stored in bulk in all major hospitals across Pakistan. There is no cure for swine flu, only precaution. The swine flu can be prevented by improved hygiene, avoiding contact with flu patients and coughing animals.

Original Article

Effect of Ascorbic Acid on Glycation Level in Diabetic Condition

1. Samina Kousar 2. Fakhar-un-Nisa 3. Ghazala Irshad

1. Asst. Prof. of Biochemistry 2. Sen. Demonstrator, of Physiology 3. Sen. Demonstrator, of Biochemistry, UCM&D, University of Lahore

ABSTRACT

Background: Diabetes is a serious metabolic disorder that results in significant morbidity and mortality. Diabetes is characterized by hyperglycaemia resulting in various short-term metabolic changes in lipid and protein metabolism and long-term irreversible vascular changes.
Objective: In this study, effect of ascorbic acid on glycation was investigated.
Design of Study: Experimental Study.
Place of Study: Allied Hospital and National Hospital, Faisalabad.
Materials and Methods: Studies were performed by using normal and diabetic plasma. Samples were incubated for 5 weeks at 37 ^{o}C temperature and varying concentrations of glucose and vitamin C. Two glycation assays (Thioarbituric acid and Periodate) were used to measure and compare the glycation level.
Results: The results indicated that increase in glycation was observed from 1st to 3rd week of incubation and it was decreased after 5th week due to the formation of advanced glycation end products. With three concentrations of ascorbic acid variable responses were observed however, it was observed all three concentrations were responsible to increase glycation.
Conclusions: Ascorbic acid will facilitate glycation in hyperglycaemia condition and Periodate borohydride proved itself more reliable and sensitive glycation assays than TBA test.

Key Words: Glycation, Diabetes, Maillard reaction, Ascorbic acid, TBA, Periodate

INTRODUCTION

Diabetes is a serious metabolic disorder with micro and macrovascular complications that results in significant morbidity and mortality[1]. According to WHO projection, the prevalence of diabetes is likely to increase by 35%. Currently there are over 150 millions diabetics worldwide and this is likely to increase to 300 million more by the year 2025 [2]. Chronic hyperglycemia during diabetes causes glycation of body protein that in turn leads to secondary complications affecting eyes, kidney, nerves and artery[3]. The glycation process, otherwise known as the Maillard reaction, is divided into three key stages: the early reactions resulting in the formation of a Schiff base and Amadori products, the rearrangements of these chemical groups and the final reactions forming the classical Maillard browning products or now known as AGEs [4]. The *in vivo* formation of non-enzymatic glycated compounds was first detected in 1969 from studies on chromotagenic mobilities of fast moving, minor hemoglobins from diabetic patients, in particular HbA1C, now routinely used as a clinical tool in the management of glycaemic control in diabetic patients [5]. Hemoglobin and serum albumin may undergo a slow non-enzymatic glycation, mainly by formation of a Schiff base between ε-amino groups of lysine or arginine residues and glucose molecules in blood [6].

There is a novel class of enzymes found in *Aspergillus* called amadoriases, was found to catalyze the deglycation of Amadori products. Most recently, human fructosamine-3- kinase (FN3K) has been identified which phosphorylates fructoselysine (Fl) residues on glycated proteins, to Fl-3- phosphate and lead to its spontaneous decomposition, thereby reversing the nonenzymatic glycation process at an early stage[7]. Now it is the need of time to develop or isolate new compounds either from plants or synthetically to control diabetes and other age accelerating diseases. The first compound which has been extensively studied *in vitro* and *in vivo* to be a powerful inhibitor of glycation and AGE formation is aminoguanidine (AG) [8]. A derivative of vitamin B_6, (pyridoxamine) also inhibits the post Amadori steps of the Maillard reaction by sequesting catalytic metal ions and blocking oxidative degradation of Amadori intermediates[9]. The major aim of this study was to investigate effect of ascorbic acid on glycation in normal and diabetic human plasma and compare the sensitivities of Thiobarbituric Acid (TBA) and Periodate method.

MATERIALS AND METHODS

Effect on glycation was monitored by Ascorbic acid (vitamin C).

Selection of conditions and concentrations

Four concentrations ($G_{1=}$500 m*M*, $G_{2=}$250 m*M*, $G_{3=}$50 m*M and* $G_{4=}$5.5 m*M*) of glucose were used. Plasma fractions were collected from diabetic patient's blood (Type II) and from normal/ healthy male and female volunteers. Samples were stored at -20 ºC until use. Normal and diabetic plasma samples were diluted to the range having protein concentration up to 20 mg/mL. Two glycation assays were performed to measure glycation level. Total proteins (Biuret method [10]) were estimated before and after dialysis before carrying out experiments. Three concentrations of ascorbic acid ($I_{1=}$ 10 m*M*, $I_{2=}$ 5 m*M* and $I_{3\ =}$ 1 m*M*) were used for experimental studies.

Selection of Combinations

To study the effect of ascorbic acid with normal (P_N) and diabetic (P_D) plasma sixteen combinations were made and all were placed at 37 ºC at same time for five weeks (Table -1).

Glycation of Plasma

All plasma combinations were incubated with four concentrations of glucose (in PBS) at 37ºC for 1-5 weeks.

Plasma samples were dialyzed to remove free glucose after incubation as free glucose is the major hindrance in estimation of glycation level and AGE production. Glucose was again estimated after dialysis to confirm that concentration of glucose is decreased or not.

Glycation of plasma with Ascorbic acid

Plasma samples were also incubated with all glucose and three inhibitors concentration at 37ºC for 1-5 weeks.

Thiobarbituric Acid (TBA) Colorimetric Technique

TBA technique was used for the determination of both enzymatic and non-enzymatic glycation[11]. This method is based upon the reaction between fructose – amino acids and week acid, yielding 5- hydroxymethyl furfural (HMF).

Non enzymatic glycation was determined as follows.

NE Glycation = (C Glycation + E Glycation) - E Glycation

(NE = Non Enzymatic, E= Enzymatic, C= Collective)

Periodate Borohydride Assay

This test is based on the production of Formaldehyde by periodate oxidation of cis-diol, aminol, ketol or ketoamine structures. Two moles of formaldehyde are produced from hexose sugar. The amount of formaldehyde produced is quantified as the fluorescent adduct formed by condensation of formaldehyde with acetyl acetone and ammonia. Fructose is used as standard as it is structurally analogous to the ketoamine form of the glycogroups[12,13]

Table 1: Different combinations for Plasma glycation inhibition

S#	Combinations for Normal/ Diabetic Plasma	S#	Combinations for Normal/ Diabetic Plasma
1	$G_1 + P_{N/D}$	9	$G_3 + P_{N/D}$
2	$G_1 + P_{N/D} + I_1$	10	$G_3 + P_{N/D} + I_1$
3	$G_1 + P_{N/D} + I_2$	11	$G_3 + P_{N/D} + I_2$
4	$G_1 + P_{N/D} + I_3$	12	$G_3 + P_{N/D} + I_3$
5	$G_2 + P_{N/D}$	13	$G_4 + P_{N/Ds}$
6	$G_2 + P_{N/D} + I_1$	14	$G_4 + P_{N/D} + I_1$
7	$G_2 + P_{N/D} + I_2$	15	$G_4 + P_{N/D} + I_2$
8	$G_2 + P_{N/D} + I_3$	16	$G_4 + P_{N/D} + I_3$

RESULTS

Effect of ascorbic acid on glycation level with normal human plasma

The results after the measurement of glycation level and effect of ascorbic acid on glycation measured by both TBA and Periodate borohydride assays with normal human plasma are given in Figure 1&2.

At 37 ºC temperature, glycation was given maximum with G_1 (5.616 mole/mole) and was minimum with G_4 (2.540 mole/mole) after 3rd and 1st week respectively when measured by TBA. Instead of glycation inhibition ascorbic acid facilitated glycation and increased it, this increased was maximum by I_1 (10 m*M*) followed by I_2 (5 m*M*) and glycation inhibition was only seen by I_3 (1m*M*) concentration of ascorbic acid (Figure-1).

Same trend of glycation acceleration was also measured by Periodate borohydride assay but more sensitively. With this assay, 500 m*M* (G_1) glucose concentration showed maximum glycation i.e. 5.906 mole/mole after 3rd week of incubation and 5.5 m*M* (G_4) give minimum i.e. 3.986 mole/mole after 1st week of incubation. Again I_3 (1m*M*) was the only concentration who showed inhibition (Figure-2).

Effect of ascorbic acid on glycation level with diabetic human plasma

Effect of ascorbic acid on glycation with diabetic human plasma was measured by TBA (Figure 3).

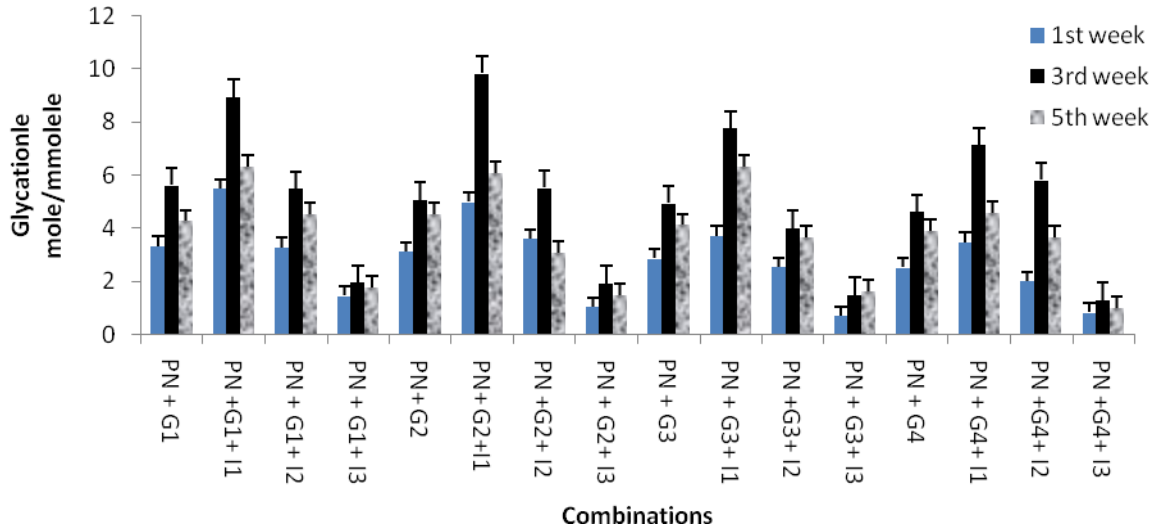


Figure 1: Effect of vitamin C on glycation level with TBA in normal human plasma

Normal plasma protein ($P_N \approx 20$ mg/mL) was incubated with all glucose concentrations (G_1= 500 m*M*, G_2= 250 m*M*, G_3= 50 m*M* & G_4= 5.5 m*M*) and Ascorbic acid as an inhibitor with three concentrations (I_1= 10 m*M*, I_2= 5 m*M* & I_3 =1m*M*) in 0.075 *M* PBS (pH 7.4, 0.1% Sodium Azide) and reaction mixtures were incubated at 37 ºC for 5 weeks at the same time. Samples were analysed after 1st, 3rd and 5th week and glycation level was measured in mole\ mole (glucose\ protein).

***** Values were the average of experiments carried out at n= 3

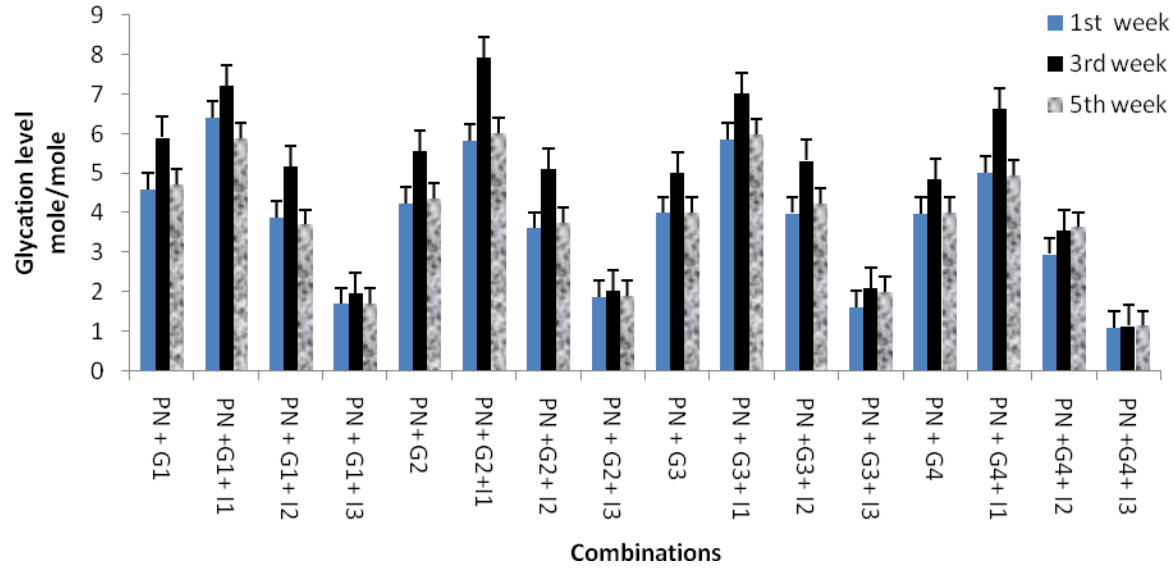


Figure 2: Effect of Ascorbic acid on glycation level with Periodate borohydride assay in normal human plasma

Normal plasma protein ($P_N \approx 20$ mg/mL) was incubated with all glucose concentrations (G_1= 500 m*M*, G_2= 250 m*M*, G_3= 50 m*M* & G_4= 5.5 m*M*) and Ascorbic acid as an inhibitor with three concentrations (I_1= 10 m*M*, I_2= 5 m*M* & I_3 =1m*M*) in 0.075 *M* PBS (pH 7.4, 0.1% Sodium Azide) and reaction mixtures were incubated at 37 ºC for 5 weeks at the same time. Samples were analysed after 1st, 3rd and 5th week and glycation level was measured in mole\ mole (glucose\ protein).

***** Values were the average of experiments carried out at n= 3

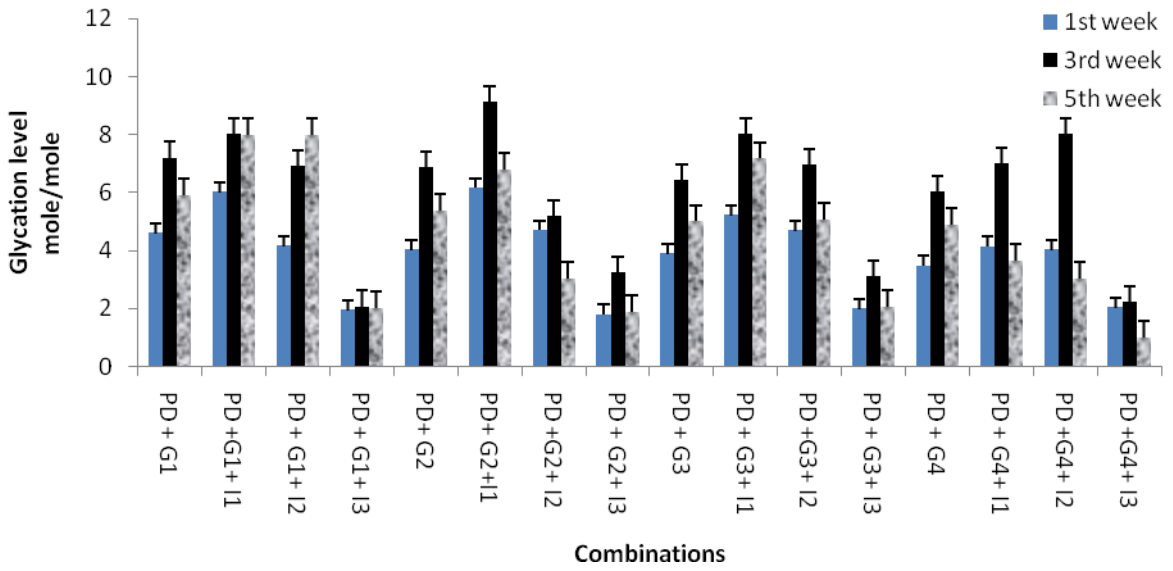


Figure 3: Effect of Ascorbic acid on glycation level with TBA in diabetic human plasma

Diabetic plasma protein ($P_D \approx 20$ mg/mL) was incubated with all glucose concentrations (G_1= 500 m*M*, G_2= 250 m*M*, G_3= 50 m*M* & G_4= 5.5 m*M*) and Ascorbic acid as an inhibitor with three concentrations (I_1= 10 m*M*, I_2= 5 m*M* & I_3 =1m*M*) in 0.075 *M* PBS (pH 7.4, 0.1% Sodium Azide) and reaction mixtures were incubated at 37 ^oC for 5 weeks at the same time. Samples were analysed after 1st, 3rd and 5th week and glycation level was measured in mole\ mole (glucose\ protein).

***** Values were the average of experiments carried out at n= 3

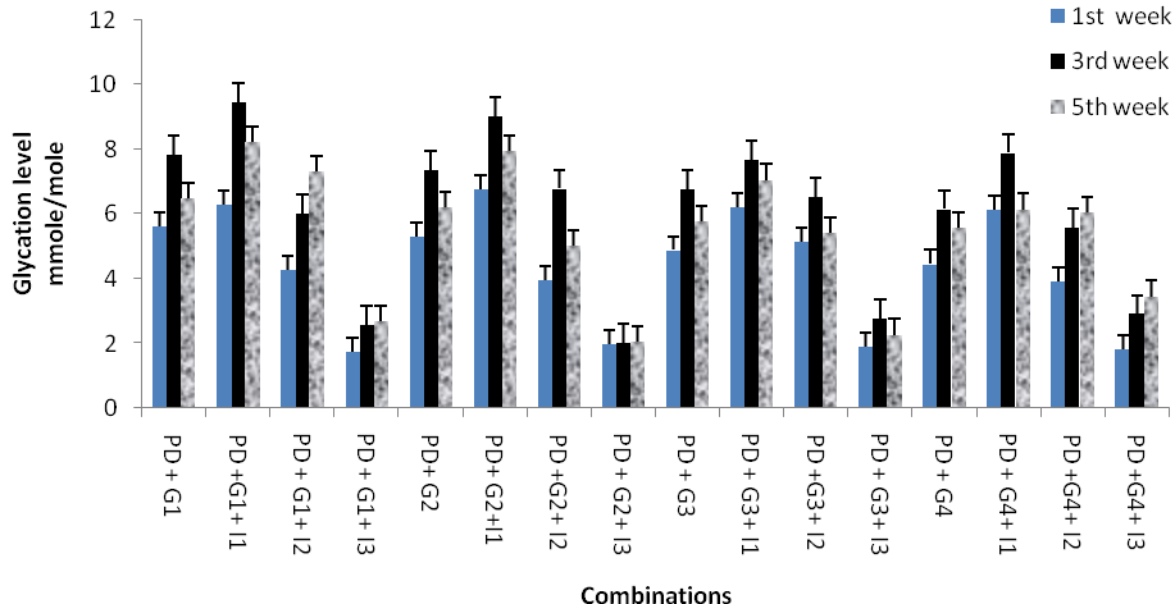


Figure 4: Effect of Ascorbic acid on glycation level with Periodate borohydride assay in diabetic human plasma

Diabetic plasma protein ($P_D \approx 20$ mg/mL) was incubated with all glucose concentrations (G_1= 500 m*M*, G_2= 250 m*M*, G_3= 50 m*M* & G_4= 5.5 m*M*) and Ascorbic acid as an inhibitor with three concentrations (I_1= 10 m*M*, I_2= 5 m*M* & I_3 =1m*M*) in 0.075 *M* PBS (pH 7.4, 0.1% Sodium Azide) and reaction mixtures were incubated at 37 ^oC for 5 weeks at the same time. Samples were analysed after 1st, 3rd and 5th week and glycation level was measured in mole\ mole (glucose\ protein).

***** Values were the average of experiments carried out at n= 3

Glycation level at 37 ^{o}C temperature, was given maximum with G_1 (500 m*M*) having value 7.195 mole/mole when measured by TBA and was minimum with G_4 (5.5 m*M*) with 3.466 mole/mole after 3rd and 1st week respectively. Again with ascorbic acid, instead of glycation inhibition, increased in glycation was maximum by I_1(10 m*M*) even it was almost double as compare to glucose concentrationthen. I_2 (5 m*M*) also activator of glycation only I_3 (1m*M*) was the concentration of ascorbic acid who inhibited glycation but not so actively (Figure-3).

When glycation level was measured by Periodate borohydride assay in diabetic human plasma it was observed, 500 m*M* (G_1) glucose concentration showed maximum glycation i.e. 7.838 mole/mole after 3rd week of incubation and 5.5 m*M* (G_4) give minimum i.e.4.453 mole/mole after 1st week of incubation. Again I_3 (1m*M*) was the only concentration who showed inhibition (Figure-4).

DISCUSSION

The results after the measurement of glycation level and effect of ascorbic acid on glycation measured by both TBA and Periodate borohydride assays with normal and diabetic human plasma indicated that ascorbic acid facilitate glycation in hyperglycaemia condition. Our results go against previous findings who quantified Amadori products and AGEs by thiobarbituric acid colorimetry and intrinsic fluorescence respectively. The inhibitors included ascorbic acid, tocopherol, pyridoxal, niacinamide, sodium selenite, selenium yeast, and carnosine showed significant correlation between the inhibition of glycation and the inhibition of AGE formation. They observed serum protein glycation was decreased with an average of 46.8% by ascorbic acid[14]. There is a report that also presents the phenomenon of non-enzymatic glycosylation and observed vitamin C had lowering effects on non-enzymatic glycation[15]. However, the data evaluated by few scientists argued our results as they studied non enzymatic glycation and AGEs formation by glucose and/or ascorbate, *in vitro*. The incubation of 100 m*M* D-glucose and 10 m*M* L-ascorbate with lens proteins resulted in an increasing incorporation over 3 weeks, ascorbate was 18-fold more reactive with lens proteins than glucose. Protein crosslinking was not obvious with 250 m*M* glucose but ascorbate caused extensive crosslinking even at 3.0 m*M*. On a molar basis, ascorbate was 70 fold more active than glucose and 100 fold more active than fructose in the cross-linking assay[16]. Our results were also favored by a study, that proteins are subject of post-translational modification by sugars and their degradation products *in vivo*, the process is often referred as glycation. According to them L-Dehydroascorbic acid, an oxidation product of L-ascorbic acid, is known as a potent glycation agent[17]. Our results are inline by a report which explains AGEs such as carboxy methyl lysine (CML) and carboxy ethyl lysine (CEL) require oxidative fragmentation of the carbon skeleton of glucose, but may also be formed from other hexoses, glycolytic intermediates and ascorbic acid[18].

In this study two glycation assays were used to measure glycation level and it was found Periodate borohydride assay is more sensitive than TBA method. Gallop, [12] quantified the glycation level of hemoglobin with Periodate borohydride method and it was further adapted by using a microplate reader with sensitivity enhancement (0.1 mg protein). They concluded this technique should be of particular importance for investigating the role of glycation of membrane proteins in the pathogenesis of diabetes.

It was also clear from the results that in most of experiments maximum glycation was in 3rd week of incubation. In the 1st week it was increased and became maximum in 3rd week and that was again decreased in 5th week. At low glucose level, glycation was low which is in accordance to previous findings [19]. The results of present study were also in accordance with few studies where it was found that glucose concentration and incubation time are the most clinically relevant variables affecting the extent of glycation. Characteristic to diabetes, increased level of glucose concentration cause the level of amadori products on protein to rise[20,21].

CONCLUSION

It was reported from our findings, ascorbic acid facilitates glycation in hyperglycemia condition and Periodate borohydride is more sensitive and efficient method for measuring glycation level.

REFRENCES

1. Rang HP, Dale MM, Ritters JM. The endocrine pancreas and the control of blood glucose. In: Simmons B, Beasley S. editors. Pharmacology. 3rd UK, Longman Group Ltd; 1991; p. 403-410.
2. Boyle JP, Honey C, Honeycutt AA, Narayan KM, Hoerger TJ, Geisis LS. Projection of diabetes burden through 2025: Impact of changing demography and disease prevalence in the U.S. Diabetes Care 2001; 24: 1936-1940.
3. Sharma AK. Diabetes mellitus and its complication: An update (1st Macmillan, New Delhi) 1993.
4. Barry IH, Marion AH, Loredana B, Thoralf W, Bernhard M, Yan L, et al. Glycation and diabetes: The RAGE connection. Current Science 2002; 83(12):

5. Rahbar S, Blumenfeld O, Ranney HM. Studies of an unusual hemoglobin in patients with diabetes mellitus. Biochem. Biophys. Res Commun, 1969; 36:838–843.
6. Iberg N, Fluckiger R. Nonenzymatic glycosylation of albumin in vivo. Identification of multiple glycosylated sites. J Biol Chem 1986; 261 (29): 13542-13545.
7. Szwergold BS, Howell S, Beisswenger PJ.Human fructosamine- 3 kinase: purification, sequencing, substrate specificity and evidence of activity in vivo. Diabetes 2001; 50: 2139- 2147.
8. Brownlee M.Glycation and diabetic complications. Diabetes 1994; 43: 836- 841.
9. Voziyan PA, Hudson BGPyridoxamine: the many virtues of a maillard reaction inhibitor. Ann NY Acad Sci 2005; 1043: 807- 816.
10. Gornall AG, Bardawill CS, David MM. Determination of serum proteins by means of biuret reaction J. BioI Chem 1949; 177: 751-766.
11. Furth AJ. Methods for assaying non enzymatic glycosylation: a review. Anal. Biochem. 1988; 175: 347- 360.
12. Gallop PM, Fluckiger R, Hanneken A, Mininshon MM, Gabbay KH. Chemical quantitation of hemoglobin glycosylation: fluorometric detection of formaldehyde released upon periodate oxidation of glycoglobin. Anal. Biochem. 1981; 117: 427- 432.
13. Zhang EY, Swaan PW. Determination of Membrane Protein Glycation in Diabetic Tissue. AAPS Pharm Sci 1999; 1(4): 20- 24.
14. Vinson JA, Howard TB. Inhibition of protein glycation and advanced glycation end products by ascorbic acid and other vitamins and nutrients. J Nutr Biochem 1996; 7: 659-663.
15. Emekli N. Nonenzymatic glycosylation of tissue and blood proteins. J Marmara Univ Dent Fac 1996; 2(2-3):530-534.
16. Lee KW, Mossine V, Ortwerth BJ. The relative ability of glucose and ascorbate to glycate and crosslink lens proteins *in vitro*. Off. Exp. Eye Res 1998; 67 (1): 95-104.
17. Argirov OK, Lin B, Olesen P, Ortwerth BG. Isolation and characterization of a new advanced glycation endproduct of dehydroascorbic acid and lysine. Biochim Biophys Acta 2003; 17:1620: 235-244.
18. Thorpe SR, Baynes JW. Maillard reaction products in tissue proteins: new products and new perspectives. Amino Acids 2003; 25: 275–281.
19. Winocour PD, Watala C, Perry DW, Rathbone RL. Decreased platelet membrane fluidity due to glycation or acetylation of membrane proteins.Thromb Haemost. 1992; 68(5):577-582.
20. Eble AS, Thorpe SR, Baynes JW. Non-enzymatic glucosylation and glucose- dependent crosslinking of protein. J Biol Chem 1983; 258: 9406-9412.
21. Brownlee M. Nonenzymatic glycosylation and the pathogenesis of diabetic complications. Annal Internal Med 1984; 101:527-537.

Address for Corresponding Author:

Samina Kousar,

Assistant Professor, Dept. of Biochemistry, University College of Medicine and Dentistry, University of Lahore. 1-KM Defense Road, OFF Raiwaind Road, Lahore, Pakistan (email: samphdbio@gmail.com)

Mobile # 0306-4822900, Office: 04335321457 Ext.116)

Original Article

Malnutrition Assessment of Chronic Obstructive Pulmonary Disease Patients

1. Mahmood Nasir Malik 2. Waseem Shafqat 3. Shariq Sohail 4. Saba Imtiaz

1, 2. Assoc. Prof. of Medicine 3. Asstt. Prof. of Cardiology 4. PGR Medicine,
Allama Iqbal Medical College, Lahore.

ABSTRACT

Objectives: To assess the prevalence and severity of malnutrition among COPD patients along with the effect of dietary intervention on the disease outcome.

Study Design: This was an interventional, Quasi- experimental study.

Place and duration of Study: The study was conducted at Department of Medicine and Department of Chest Diseases, Jinnah Hospital, Lahore. Total duration was one year from April 2009 to March 2010.

Materials and Methods:

Sample Size: 100 patients with COPD were investigated.

Sampling: Purposive Non-probability sampling.

Results: Majority of the patients were in the age range 50 – 70 years with more males than females. 97% patients had a positive tobacco smoking history. 57 - 78% of the patients included in the study were found to be malnourished, out of which 65 - 68% were moderately malnourished and 10% were severely malnourished according to SGA rating and BMI. There was a strong correlation between COPD staging and malnourishment. 54% patients with stage III COPD were malnourished while 90% patients with stage IV were found to be malnourished.

Conclusion: Malnutrition is invariably observed in COPD patients and is more frequent and more severe in patients with advanced stage disease. Patients with COPD might benefit from a dietary intervention both in terms of pulmonary functions and nutritional state, which might have beneficial effects on prognosis.

Key Words: Malnutrition, Nutritional assessment, COPD, Dietary intervention.

INTRODUCTION

Malnutrition exists everywhere in the world both in the community and in the hospitalized patients[1]. Malnutrition can be chronic or acute. The chronic form may occur in patients with chronic illnesses due to low protein intake, poor food choices or protein depletion. The acute form may occur as a result of reduced or absence of food intake due to disease, drug therapy and depression or from increased energy expenditure in hyper metabolic states[2]. The most commonly applied clinical definition of malnutrition is an unintentional weight loss of at least 10% in three to six months[3,4] The incidence of malnutrition in patients with chronic illnesses is because of many reasons. These could be the disease condition itself, the stress of the disease, the stress of the physical/clinical investigations and the fear of facing the doctors and paramedics. Higher the degree of malnutrition the longer would be the stay in hospital.

The Chronic obstructive pulmonary disease (COPD) refers to a group of conditions that cause shortness of breath and are associated with obstruction of airflow within the lung. COPD includes emphysema and chronic bronchitis. COPD is the fourth leading cause of death in United States. COPD prevalence has increased dramatically in the past few decades and is one of the major causes of bed-confining disability. Most of the time COPD is secondary to tobacco abuse. Men are more likely to have COPD than women and it occurs predominantly in individuals over 40 years of age. Malnutrition occurs in 50 to 60 % of the patients with COPD. Nutritional status disorder causes a serious problem which concerns about $1/8^{th}$ of COPD population[5]. It has been established that severity of dyspnea in COPD patient is significantly greater in the underweight compared with the normal weight. Changes in the nutritional status such as weight loss and malnutrition are very common complications in patients with COPD. Malnutrition in these patients is due to multiple factors including increase in resting energy expenditure, decreased food intake, the effects of certain drugs, and, perhaps most importantly, a high systemic inflammatory response[6]. Progressive weight loss of greater than 5% change in one month or greater than 20% change in one year is considered severe and can lead to malnutrition. Major causes of malnutrition

in COPD patients are; poor dietary intake, increased energy expenditure, frequent recurrent infections, cigarette smoking and poor knowledge of nutrition together with bad living and eating habits. Nutritional manifestations of COPD, notably weight loss and obesity, have been recognized. Now linked to increase in knowledge regarding systemic inflammation, it is becoming clear that poor nutritional status is not only a manifestation of COPD but also a predictor of mortality and health care utilization[7].

In industrialized countries, 25% to 60% of COPD patients have a body weight lower than 90% of their ideal bodyweight or have lost 5 to 10% of their initial body weight. This weight loss is indicative of poor prognosis. The combined results of the two survival analyses provide evidence to support the hypothesis that body weight has an independent effect on survival in COPD. Reduced force expiratory volume in one second (FEV_1) is the best indicator of airway obstruction and is a major predictive factor of survival in COPD[8].

Nutrition assessment is best achieved with a tool that relies on the sum of a variety of evaluations that are easy-to-use, cost-effective, contain an action plan and could be validated[9]. A number of nutrition screening and assessment tools have evolved over the years but traditionally there are two methods available. The first is biochemical and anthropometric data, including measurement of body mass index (BMI), skin fold-thickness, measurement of creatinine/height index, serum albumin, transferin and pre-albumin and the total lymphocyte count in blood. These methods are not particularly sensitive or specific, their normal range is wide and they are influenced by the nature, length and seriousness of the various diseases.

This assessment is based on clinical observation, weight change and clinical examination (edema, dehydration, loss of subcutaneous fat and muscle depletion)[3,9].

MATERIALS AND METHODS

This interventional, quasi-experimental study was carried out from April 2009 to March 2010 in Department of Medicine and Chest Diseases, Jinnah Hospital, Lahore. A total of 100 subjects were included in the study.

RESULTS

During the study period a total of 120 COPD patients were enrolled but 20 patients did not turn up for follow up, hence data was restricted to evaluation of 100 patients. The baseline characteristics of the study population are summarized in table-1.

Correlation between COPD stage and ad BMI is shown in table-2. Characteristics of patients sin group-A and B are shown in table-3.

Comparison of controls and cases before dietary intervention is summarized in tbale-4.

Mean of controls and cases before dietary intervention is given in table-5.

Table-6 shows comparison of COPD stage between controls (without dietary intervention) and cases (after dietary intervention).

Table-7 shows comparison of means between controls (without dietary intervention) and cases (after dietary intervention.

Comparison of COPD stage between cases before and after dietary intervention is given in table-8.

Table-9 depicts the comparison of means between cases before and after dietary intervention.

Table # 1: Baseline characteristics for each variable in 100 patients

Variables		Frequency (n)	Cumulative Percent (%)
Age (yrs)	30-50	31	31.0
	51-70	64	95.0
	71-90	5	100.0
Sex	Male	94	94.0
	Female	6	100.0
Smoking History	+ve	97	97.0
	-ve	3	100.0
COPD	Stage I	5	5.0
	Stage II	30	35.0
	Stage III	44	79.0
	Stage IV	21	100.0
SGA Rating	Well nourished	25	25.0
	Moderately malnourished	65	90.0
	Severely malnourished	10	100.0
BMI	>20	22	22.0
	18.5-20	68	90.0
	<18.5	10	100.0
MUAC (cm)	≤21	63	63.0
TSFT (mm)	≤11	63	63.0
Hb (gm/dl)	≤13.5	61	61.0
TLC (cell/μl)	≤1.5	25	25.0
Serum Albumin	≤3.5	26	26.0

(mg/dl)			

Table # 2: Correlation between copd stage and bmi

			Body Mass Index			Total
			>20	18.5-20	<18.5	
COPD	Stage I	Count	1	4	0	5
		% Within Body Mass Index	4.5%	5.9%	.0%	5.0%
	Stage II	Count	15	15	0	30
		% Within Body Mass Index	68.2%	22.1%	.0%	30.0%
	Stage III	Count	6	37	1	44
		% Within Body Mass Index	27.3%	54.4%	10.0%	44.0%
	Stage IV	Count	0	12	9	21
		% Within Body Mass Index	.0%	17.6%	90.0%	21.0%
Total			22	68	10	100

Table # 3: Characteristics of Patients in Group A and Group B

Variables		**Group A**	**Group B**
		n (%)	**n (%)**
COPD	Stage I	5 (10%)	-
	Stage II	30 (60%)	-
	Stage III	11 (22%)	33 (66%)
	Stage IV	4 (8%)	17 (34%)
SGA Rating	Well nourished	19 (38%)	6 (12%)
	Moderately malnourished	30 (60%)	35 (70%)
	Severely malnourished	1 (2%)	9 (18%)
BMI	>20	17 (34%)	5 (10%)
	18.5-20	32 (64%)	36 (72%)
	<18.5	1 (2%)	9 (18%)
MUAC (cm)	≤21	26 (52%)	37(74%)
TSFT(mm)	≤11	24 (48%)	39 (78%)
Hb (gm/dl)	≤13.5	25 (50%)	36 (72%)
TLC(cells/µl)	≤1.5	10 (20%)	15 (30%)
Serum Albumin (mg/dl)	≤3.5	9 (18%)	17 (34%)

Table #4: Comparison of Controls and Cases Before Dietary Intervention

Variables		Controls (A_1& B_1)	Cases (A_2 &B_2)
		n (%)	n (%)
COPD	*Stage I*	4 (8%)	1 (2%)
	Stage II	16(32%)	14 (28%)
	Stage III	21 (42%)	23 (46%)
	Stage IV	9 (18%)	12 (24%)
SGA rating	Well nourished	12 (24%)	13 (26%)
	Moderately malnourished	34 (68%)	31 (62%)
	Severely malnourished	4 (8%)	6 (12%)
BMI	>20	9(18%)	13 (26%)
	18.5-20	37 (74%)	31 (62%)
	<18.5	4 (8%)	6 (12%)

Table # 5: Mean of Controls and Cases Before Dietary Intervention

	Controls (A_1& B_1)	Cases (A_2 & B_2)
	Mean ± SD	Mean ± SD
MUAC	21.01 ± 3.78	21.05 ± 3.89
TSFT	12.11 ± 4	11.89 ± 3.25
Hb level	12.5 ± 1.9	12.7 ± 1.96
TLC	3.74 ± 0.51	3.67 ± 0.48
S. Albumin	2.43 ± 0.97	2.5 ± 1

Table # 6: Comparison of Copd Stage Between Controls (Without Dietary Intervention) & Cases (After Dietary Intervention)

COPD	Controls (A_1& B_1)	Cases (A_2 & B_2)
	n (%)	n (%)
Stage I	4 (8%)	2 (4%)
Stage II	16 (32%)	14 (28%)
Stage III	21 (42%)	23 (46%)
Stage IV	9 (18%)	11 (22%)
Total	50 (100%)	50 (100%)

Pearson Chi-Square p value 0.405

Table # 7: Comparison Of Means Between Controls (Without Dietary Intervention) And Cases (After Dietary Intervention)

	Controls (A_1 & B_1)	Cases (A_2 & B_2)	p value
	Mean ± SD	Mean ± SD	
MUAC	21.12 ± 3.81	21.43 ± 3.88	0.644
TSFT	12.13 ± 3.99	12.3 ± 3.30	0.806
Hb level	12.6 ± 1.93	12.75 ± 1.84	0.286
TLC	2.48 ± 0.99	2.49 ± 0.97	0.583
S. Albumin	3.7 ± 0.99	3.73 ± 0.44	0.241

DISCUSSION

In our study we found that the prevalence of malnutrition was significantly higher in the COPD

patients coming to our healthy facility, 65-68% patients had moderate malnourishment according to SGA rating and BMI respectively, while 10% had severe

Table # 8: Comparison of Copd Stage Between Cases Before and After Dietary Intervention

COPD	Cases before Dietary Intervention	Cases after Dietary Intervention
	n (%)	n (%)
Stage I	1 (2%)	2 (4%)
Stage II	14 (28%)	14 (28%)
Stage III	23 (46%)	23 (46%)
Stage IV	12 (24%)	11 (22%)
Total	50 (100%)	50 (100%)

Pearson Chi-Square p value 0.000

Table # 9: Comparison of Means Between Cases Before and After Dietary Intervention

	Before Dietary Intervention	After Dietary Intervention	p value
	Mean ± SD	Mean ± SD	
MUAC	21.05 ± 3.89	21.43 ± 3.88	0.029
TSFT	11.89 ± 3.25	12.3 ± 3.3	0.022
Hb level	12.7 ± 1.97	12.94 ± 1.76	0.073
TLC	2.52 ± 1.00	2.65 ± 0.93	0.030
S.Albumin	3.67 ± 0.48	3.7 ± 0.42	0.182

Malnourishment. The decrease in TSFT, MUCA, BMI and results of SGA questionnaire indicate a depletion of both subscutaneous fat stores and lean body mass, which fulfill criteria of marasmic protein caloric malnutrition. In present study, malnutrition predominantly affected body fat stores; TSFT was below the cut off value in 63% of our patients. Similar findings have been reported in studies conducted in stable COPD patients in whom MUAC was found to be moderately decreased in about 42% of the patients [11,12].

In this present study the malnourished patients showed more severe bronchial obstruction than their well nourished counter parts. 54% of moderately malnourished patients had stage III. COPD and 90% of severely malnourished patients had stage I (FEV1 - 30%) disease. Similar results have been reported in various other studies. There is a positive correlation between body weight and FEV_1[12,13].

Comparison between control group (A1 and B1) without any dietary intervention and cases (A2 and B2) with dietary intervention after 3 months follow up revealed no significant improvement in nutritional parameters. Since the two comparative groups were not well matched for age, sex and other baseline characteristics, the insignificance of results was encountered. Despite limitation in the use of body weight as a measure of nutritional status, it presents the only measure of nutritional status, it has been clearly associated with n adverse outcome[14].

A systemic review of randomized controlled trials of routine protein adults based on anthropometric idices. Other nutritional intervention studies carried out in malnourished patients with COPD showed weight gain but insignificant improvements in respiratory muscle function. FEV_1 did not respond to nutritional therapy but FVC increased significantly in the supplemented group and a strong trend for improved general well being was observed[15].

Screening tools, such as body composition measurements and the SGA questionnaire, are valuable for determining which patients need further nutrition evaluation. The benefit of body composition measurement is that it is a rapid and cost effective method for determining which patients at nutritional risks[16].

CONCLUSION

Malnutrition is invariably observed in COPD patients and is more frequent and more severe in patients with advanced stage disease. Patients with COPD might benefit from a dietary intervention both in terms of pulmonary function and nutritional state which might have beneficial effects on prognosis.

REFERENCES

1. Khattak MMA, Khan A, Begum S, Abid J, Qadir SS. Evaluation of nutritional status of recently hospitalized patients. Pak J Nutr 2002; 1: 212-16.
2. Campbell SE, Avenell A, Walker AE. Assessment of nutritional status in hospital in-patients. Q J Med 2002; 95: 83-87.
3. Kruif J, Th C M, Vos A. An algorithm for the clinical assessment of nutritional status in hospitalized patients. Br J Nutr 2003; 90: 829-36.
4. Halsted CH. Malnutrition and Nutritional Assessment. In: Kasper DL, Braunwald E, Fauci A S, Hauser S L, Longo D L, Jameson JL. Harrison's Principles of internal medicine. 16th Ed. New York: McGraw-Hill, 2005: 411-15.
5. Kozuar-Kaminska B, Batura Gabyel M, Bragh B. Analysis of nutritional status disorder in patients with COPD. Pneumonal Alhgol Pol. 2008,76(5):327-33.
6. Batres SA, Leo JV. Nutritional status in COPD. Archivos de Braconeumologin, volume 43, Issue 5, 2007:283-288.
7. Kelly C. Optimizing nutrition in COPD. The British Journal of primary care nursing. Volume 1, Number 3; June 2007.

8. Congleton J. The pulmonary cachexia syndrome: aspects of energy balance. Proc. Nutr. Soc. 1999; 58: 321-28.
9. Dawson PJ. Nutrition in Pakistan: estimating the economic demand for calories. Pak J Nutr 2002; 1: 64-66.
10. Cochrane WJ, Afolabi OA. Investigation into the nutritional status, dietary intake and smoking habits of patients with chronic obstructive pulmonary disease. Journal of Human Nutrition and Dietetics 2004; 17: 3-11.
11. Hunter AMB, Carey MA, Larsh HW. The nutritional status of patients with chronic obstructive pulmonary disease. Am Rev Respir Dis 1981; 124: 376-81.
12. Chwist-Nowak A, Rozentryt P, Chwist J, Jarzab J. Cachexia in chronic pulmonary obstructive disease. Wiad Lek. 2006; 59(1-2): 84-8.
13. Ezzell L, Jensen GL. Malnutrition in chronic obstructive pulmonary disease. American Journal of Clinical Nutrition 2000; 72: 1415-16.
14. Visser S. Nutrition in patients with COPD. SA Respiratory journal.
15. Saudny-Unterberger H, Martin JG, Gray-Donald K. Impact of nutritional support on functional status during an acute exacerbation of chronic obstructive pulmonary disease. Am J Respir Crit Care Med 1997; 156: 794–799.
16. Lerario MC, Sachs A, Lazaretti-Castro M, Saraiva LG, Jardim JR. Body composition in patients with chronic obstructive pulmonary disease: which method to use in clinical practice? Br J Nutr 2006 Jul; 96: 86-92.

Address for Corresponding Author:
Dr. Mahmood Nasir Malik,
Associate Professor,
Department of Medicine,
Jinnah Hospital, Lahore.

Original Article

Bottle Feeding in Children under Two Years of Age in Multan; A hospital based study

1. Ibad Ali 2. Muhammad Waqar Rabbani 3. Muhammad Aslam Sheikh

1. Asstt. Prof. of Pediatrics 2. Assoc. Prof. of Pediatrics 3. Asstt. Prof. of Pediatrics, Children Hospital & Institute of Child Health Multan

ABSTRACT

Objective: To explore the factors responsible for bottle-feeding practice among mothers of children less than two years of age in Multan region.

Design: An observational cross-sectional study.

Duration & Setting: The patients who were admitted in Pediatric ward and/or attending OPD at Children Hospital and The Institute of Child Health Multan from 1 January 2010 to 26 June, 2010

Materials and Methods: 450 mothers, feeding their children with bottle, were interviewed about their infant feeding practices. A predesigned questioner was used to get detailed information.

Results: Bottle feeding was more prevalent in illiterate 98(48%) and poor education class mothers, lower social class women 109(45%), Multigravida 159(54%) and in the mothers between 26 to 30year of age 78(61%). More common causes of bottle feeding were complaint of insufficient milk by mothers 89(41%) and early baby illnesses 42(39.2%).

Conclusion: In my study major determinants of bottle feeding are related to poverty and lack of education about breast feeding and proper weaning practices.

Key words: Bottle feeding practices, children less than two years, determinants of bottle feeding

INTRODUCTION

Breast-feeding is the natural and physiological way of feeding the infants and young children[1]. WHO recommends exclusive breast feeding up to 6 months of age[2]. . Human milk is the natural milk made for human infants, it is the only food the baby needs till four months of age and most of the babies do very well on breast milk alone for six months of age [3, 4]. It decreases infections, diabetes mellitus, enterocolitis, asthma[5, 6] and enhances cognitive development. [7, 8]

There is no advantage of adding other foods or milk to breast milk before 4-6 months, except under unusual or extraordinary circumstances[9, 4]. Despite increasing medical research showing benefits of breast feeding for both mothers and babies, many women opt bottle-feeding for their infants.[10 11] A rising number of women in developing countries like Pakistan are supplementing breast milk with formula and fresh animal milk and stop breast feeding earlier[12].[13, 14] The use of bottle for feeding started initially in the west, soon became a widespread phenomenon globally[15]. As a result, bottle-feeding is now a socially and culturally accepted norm in underdeveloped countries including Pakistan[16]. The bottle is used not only to give milk but all other types of fluids e.g. water, tea, juice.[17] Much harm is associated with bottle feeding, especially in areas where sanitation is poor, because it requires a sterilized water supply, both to mix the formula and to sterilize the bottle, even small amounts of polluted water can radically increase the risk of diarrhea.[14,18]There is a higher risk of childhood morbidity and mortality, malnutrition, GIT infections, ear infections, [19,20,21] allergic tendency[22] and dental caries in bottle fed infants.[23] It does not provide immunological protection as breast milk does, so putting the child more prone to infections[24]. Recently a detailed comprehensive report, using data both from developed and developing countries highlighted the increased relative risk of infant mortality in formula fed versus breast-fed infants[25].

MATERIALS AND METHODS

This study was conducted at Children Hospital and The Institute of Child Health Multan from 1 January 2010 to 26 June, 2010. The infants (from birth to the age of 2 years) who were admitted in the pediatric ward and attending OPD for different illnesses were recruited, mothers of these infants (450) were interviewed about their feeding practices. A questionnaire was used to record the information regarding, age of the baby, age

of the mother, mother's education, monthly income, feeding patterns including; exclusive breast feeding, exclusive bottle feeding or receiving both bottle and breast-feeding, parity and reasons for bottle-feeding. Those babies receiving both (bottle and breast feeding) were also considered bottle fed. Socio-economic class of the infant's family was defined as: monthly income of Rupees 7000 was considered as lower social class, Rupees 20000 as middle and above Rupees 20000 as upper social class. Mothers were also classified according to their educational status into illiterate, primary, middle, matric and intermediate and above. All the data was analyzed

RESULTS

In this study, out of 450 infants 232(51%) were on exclusive breast feeding, and 218 (49%) were on bottle feeding. **Table 1** shows that bottle feeding increases with age, only 30% of the infants under the age of 4 month were offered bottle, it was 39% between 5 to 6 months and increased to 73% in infants from 7 to 12 months. Bottle feeding was more common in illiterate women 205 (48%) as compared to educated mothers shown in **table 2**. The mothers belonging to lower social class were giving more bottle feeding109 (45%) as compared to middle 63(33%) and higher classes 5(33%) given in **table 3**. Bottle feeding was more common among multipara women159 (54%) shown in **table 4.** The mothers in age group between 26 to 30 years, showed preference for using bottle, mentioned in **table 5**. The important causes of bottle feeding were inadequate mother's milk 89(41%), refusal of baby to take breast milk 35 (16%), baby illness 50(23%), maternal illness16 (7%), pregnancy in mothers 24(11%) and maternal employment 4(2%) as given in **Table 6**

Table 1: Ages of the babies and bottle feeding

age	Total	Exclusive breastfeeding	Bottle feeding
<1month	39	27 (70%)	12(30%)
1 to 4month	127	89(70%)	38 (30%)
5 to 6month	94	58(61%)	36(39%)
7 to 12 month	149	41(27%)	108(73%)
13 to 18 month	41	17(41%)	24(59%)
Total	450	232(51%)	218(49%)

Table 2: Education level and bottle feeding

Education level	Total	Exclusive breastfeeding	Bottle feeding
Illiterate	205	107(52%)	98(48%)
Primary	80	45(56%)	35(44%)
Middle to matric	118	77(65%)	41(35%)
Intermediate and above	47	33(70%)	14(30%)
Total	450	262	188

DISCUSSION

Early introduction of formula and animal milk results in earlier termination of breast-feeding; very rapidly happening in third world countries including Pakistan, which is not a safe way of feeding [12, 13, 14.] In poor communities of Pakistan, the leftover bottle milk is often given for subsequent feeds due to lack of awareness and poverty in poorly sterilized feeding bottles, causing increased prevalence of infections[26].

Table 3: Family income and bottle feeding

Social status	Income	total	Exclusive breastfeeding	Bottle feeding
Lower class	< 7000	245	136(55%)	109(45%)
Middle class	7000 to 20000	190	127(67%)	63(33%)
Higher class	> 20000	15	10(67%)	5(33%)

Table 4: Parity and bottle feeding

	Primarigravida	Multigravida
Total	157	293
Exclusive breast feeding	92(59%)	134(46%)
Bottle feeding	65(41%)	159(54%)

Table 5: Maternal age and Bottle feeding

Maternal age	Total	Exclusive breastfeeding	Bottle feeding
<25 years	258	147(57%)	111(43%)
26 to 30	127	49(39%)	78(61%)
31 to 35	44	32(73%)	12(27%)
>35	21	9(43%)	12(57%)

Table 6: causes of bottle feeding

Causes	N=babies
Insufficient milk	89(41%)
Infant illness	50(23%)
Refusal by baby	35(16%),
Mother illness	16(7%)
Maternal employment	4(2%)
pregnancy	24(11%)

Out of 450 infants in this study, 218(49%) babies were bottle fed, the studies from Karachi and Lahore reported use of bottle in 68% and 82% infants[25, 13]. Similar results have also been shown in a study from Bangladesh[5]. In our study there is an increasing trend of bottle feeding with advancing age, it increased from 30% (in below 4 month) to 73% between the ages of 7 to 12 months, also seen in other Pakistani studies[27, 28]. In this study illiterate mothers and mothers with primary education were practicing more bottle feeding 98(48%) and 35(44%) respectively as compared to educated mothers. This pattern has also been shown in a study from karachi[25] and Bahawalpur[29]. The lower incidence of bottle-use in educated mothers in the

present study could be due to better awareness and understanding of the advantages of breast-feeding. The mothers between 26 to 30 years of age showed preference for bottle-feeding (61%) in our study, similarly prevalence of increased bottle-feeding amongst mothers around 30 years, have also been reported in a study from Karachi.[25] Bottle use was high in multipara mothers (54%) in this survey, similar findings are seen in studies from Karachi.[25] and Malaysia.[30] This may be due to impaired nutritional reserves, lack of understanding in the mothers and they find their own milk insufficient. In large families mothers are usually busy with household working and bottle feeding may be convenient. In our study bottle feeding, is more common in lower class families, other studies also mentioned the similar results. [25, 31, 15] The increased incidence of bottle-use in lower class mothers could be due to lack of knowledge about the advantages of breastfeeding, poor nutrition, economical and social stresses. The main reasons for bottle feeding were inadequate mother's milk 89(41%), baby illness 50(23%) and refusal by baby in 35(16%).Similar main causes of bottle feeding are shown in studies from India[32]and Saudi Arab.[33]

CONCLUSION

In my study, many factors like weak socioeconomic status, poor education of mothers, increasing age of mothers, multiparity, early baby illnesses and complaint of insufficient milk by mothers resulted in early supplementation and bottle use. These determinants of bottle feeding should be evaluated and intervened, so an educational program about infant feeding may be started both at community and hospital level to discourage bottle use for infant feeding in parallel with promotion of breast-feeding practices which may reduce infant morbidity and mortality in our country. Mothers should be encouraged to continue breast feeding for as long as possible.

REFERENCES

1. Arke J. Infant feeding: The physiological basis. WHO bulletin OMS 1989; 67:41-56. Nurs 1985; 14:68 72.
2. World Health Organization. Evidence for the ten steps to successful breastfeeding. Geneva: WHO; 1998
3. WHO. Nutrition: information and attitudes among health personnel about early infant feeding practices. Wkly Epidemiol Rec 1995; 70:117-20.
4. WHO. Protecting, promoting and supporting breast - feeding: the special role of maternity services: a joint WHO/UNICEF statement. Geneva: WHO, 1989.
5. Afroza S, Begum R. Breast feeding corner support in promotion of breast feeding for intants. Bangladesh J child Health. 2003;27:38-42.
6. Slusser W, Powers N. Breastfeeding update 1: immunology, nutrition, and advocacy.Pediatrics in Review. 1997;18(4):111
7. Gartner LM, Morton J, Lawrence RA, et al. Breastfeeding and the use of human milk. Pediatrics 2005; 115:496-506.
8. Makrides M, Neumann M, Simmer K, Pater J, Gibson R. Are long-chain polyunsaturated fatty acids essential nutrients in infancy? Lancet. Jun 10 1995;345(8963):1463-1468.
9. UNICEF. Take the baby-friendly initiative. New York: UNICEF, 1991.
10. Statement of the Standing Committee on Nutrition of the British Paediatric Association. Is breast-feeding beneficial in the UK? Arch Dis Child 1994; 71:376-380.
11. Popkin BM, Adair L, Akin JS, Black R, Briscoe J, Fleiger W. Breast feeding and diarrhoeal morbidity. Pediatrics 1986; 86:874-882.
12. Boerman, J.T., S.O. Rutstein, E.A. Sommerfelt and G.T. Bicego, 1991. "Bottle use for infant feeding in developing countries: data from the demographic and health surveys." J. Tropical Pediatr., 37:116-120.
13. Imtiaz M., Izhar T. Feeding practices of infants in Lahore. J. Pak. Ped Assoc. 1997; 21:115-20.
14. shraf, R.N., F. Jalil, Khan, SRi Zaman, S. Karlberg, J. Lindblad and L.A. Hanson, 1993. "Early child health in Lahore, Pakistan. V. Feeding Patterns." Acta. Pediatr., 390 (suppl) :47-61.
15. Boema JT., Rustein SO, Sommerfelt AE, Bicego GT. Bottle use for infant feeding in developing contries: data from the demographic and health surveys. Has the bottle been lost? J Trop Pediatric. 1991; 37:116-20.
16. Nagra S.A, Jilani A. Variation in infant feeding practices in Pakistan with socioeconomic stratification. J Trop Pediatric. 1987:33; 103 – 106
17. Marques N.M., Lira Pedro I. C., Lima Marilia C., De Silva Nara Lacerda, Filho Malaquias Batista, Huttly Sharon R.A., and Ashworth Ann. Breastfeeding and early weaning practices in Northeast Brazil: A longitudinal study. Pediatrics 2001:108; e66.
18. VerDerslice, J., B. Popkin and J. Briscoe, 1994. "Drinking-water quality, sanitation, and Breast feeding: their interactive effects on infant health. Bulletin of the World Health Organization." 72, 4:589-601.
19. Gunn R.A., Kimball A.M., Pollard R.A. et al. Bottle-feeding as a risk factor for cholera in infants. Lancet 180; 2:1176-1177.

20. 21(20). WHO-Collaborative Study on the role of breast feeding on the prevention of infant mortality: effect of breast feeding on infant and child mortality due to infectious disease in less develop countries, a pooled analysis. Lancet. 2000; 355:451-5
21. D'Souza R, Bryant J. Determinants of childhood mortality in slums of Karachi, Pakistan.Journal of Health & Population in Developing Countries. 1999;2(1):33-44.
22. Celedon J, Litonjua A, Ryan L, Weiss S, Gold D. Bottle feeding in the bed or crib before sleep time and wheezing in early childhood. Pediatrics. 2002;110(6):e77.
23. Watl R.R. A National Survey of infant feeding in Asian families: Summary of findings relevant oral health. Br.Dent.J. 2000; 188:16-22.
24. Morisky D, Kar S, Chaudhry A, Chen K, Shaheen M, Chickering K. Breast Feeding Practices in Pakistan. Pakistan Journal of Nutrition. 2002;1(3):137-142.
25. Shamim S, Jamalvi W, Naz F. Determinants of bottle use amongst economically disadvantaged mothers. J Ayub Med Coll Abbottabad. 2006;18(1).
26. Lal V, Rai S. The culture of bottle-feeding. Indian Journal of Community Medicine: Official Publication of Indian Association of Preventive & Social Medicine. 2009;34(3):247.
27. Morisky D.E, Kar S.B, Chaudhry A.S, Chen K.R, Shaheen M, Chickering K. Breast feeding practices in Pakistan. Pak. J. Nut. 2002; 1:137-42.
28. Khan G.Q., Channa M.S., Warach E., Bajwa S. Practice of breast feeding in children under 2 yrs of age in Bahawalpur. Pak. J. Med. Sci. 2001; 17:94-98. ed on 09-03-2005
29. Khichi GK, Akram M. Patterns of breast feeding in children under 2 years of age in Bahawalpur. Pak J Med Sci 2001: 17: 94-8
30. Kandiah M, Ooi Guat San. Infant feeding study: knowledge and attitudes of selected pregnant women. Malays J Reprod Health. 1984 Dec;2(2):96-104
31. Li A, Baber F, Yu A. Infant feeding practices among the Kwun Tong mothers. J Hong Kong Med Ass. 1985;37(4):181-184.
32. 32.Mathur G, Chitranshi S, Mathur S, Singh S, Bhalla M. Lactation failure. Indian pediatrics. 1992;29:1541-
33. 33 Ibrahim H. Al-Ayed Breastfeeding Practices in Urban Riyadh Journal of Tropical Pediatrics 1998; 44(2):113-117

Address for Corresponding Author:
Dr. Ibad Ali,
Assistant Professor of Pediatrics,
Children Hospital & Institute of Child Health, Multan.

Original Article

Assessment of Lipid Lowering Effects of Vitamin E

1. Rahela Najam 2. Saira Saeed Khan

1. Assoc. Prof. and Chairperson, Dept. of Pharmacology, Faculty of Pharmacy, University of Karachi
2. Asstt. Prof., Dept. of Pharmacology, Faculty of Pharmacy, Jinnah University for Women, Karachi

ABSTRACT

Objective: Aim of this study was to determine the role of antioxidant vitamin E in lowering the serum cholesterol and triglyceride levels.

Place and Duration: This study was conducted in the department of Pharmacology, Faculty of Pharmacy, University of Karachi, Karachi. Duration of study was 42 days from1-03-2008 to 11-4-2008.

Materials and Methods: Male 20 rabbits were equally divided into 2 groups, group A was served as control and the group B was vitamin E treated. All the animals were maintained on cholesterol rich diet for a period of 30 days in order to induce hypercholesterolemia. After induction of hypercholesterolemia the group B was given vitamin E in a dose of 8.57mg/kg/day while the control group A was maintained on distilled water only for a period of 42 days. At the end of 42 days the blood samples were collected from marginal ear vein of rabbits and were analyzed to determine the levels of cholesterol and triglycerides.

Results: The results showed that there was decrease in the level of cholesterol but the level of triglyceride was reduced much significantly by administration of vitamin E. It has been reported earlier that vitamin E has potential to decrease levels of cholesterol and triglycerides.

Conclusion: It can be concluded that vitamin E use can reduce the level of cholesterol and triglyceride in hypercholesterolemia and may prove to be beneficial.

Key words: Alpha tocopherol or vitamin E, Hypercholesterolemia, Low density lipoprotein (LDL), Antioxidant, Oxidative stress.

INTRODUCTION

Hyperlipidemia is defined as an elevation of blood lipids particularly cholesterol and triglycerides (1).There is correlation between hyperlipidemia and lipid peroxidation so when there is increase in the lipid content more is the chance of oxidation as free radicals reacts more quickly with near by fats, charbohydrates and proteins (2). In hyperlipidemia there is increase in lipoproteins levels especially LDL which is also known as bad cholesterol. Increase lipoprotein can enhance the process of development of atherosclerosis (3). In vitro studies have shown that LDL cholesterol and, in particular, its oxidized derivative are injurious to the endothelium (4). Oxidized LDL has several biological consequences (5). It promotes vasoconstriction, promotes adhesion, stimulates cytokines such as interleukin-1 (IL-1), increases platelet aggregation, inhibits nitric oxide tissue factor secretion, and stimulates plasminogen activator inhibitor-1 synthesis. A growing evidence suggests implication of inflammatory reactions playing a major role in the development of atherosclerosis, thus, clearly supporting atherosclerosis as an inflammatory disease (6),(7). Major cellular participants in atherosclerosis include monocytes, macrophages, active vascular endothelium, T lymphocytes, platelets, and smooth muscle cells (8),(9),(10). In atherosclerosis there is up-regulation of pattern-recognition receptors for innate immunity, including scavenger receptors and toll-like receptors (11),(12). Scavenger receptors (e.g CD-36) internalize a broad range of molecules and particles bearing molecules with pathogen-like molecular patterns (11). Bacterial endotoxins, apoptotic cell fragments, and oxidized LDL particles are all taken up and destroyed through this pathway. If cholesterol derived from the uptake of oxidized LDL particles cannot be mobilized from the cell to a sufficient extent, it accumulates as cytosolic droplets. Ultimately, the cell is transformed into a foam cell, the prototypical cell in atherosclerosis.

Oxidative stress seems to play a key role in the pathogenesis of atherosclerosis (13). Free radicals, also known as reactive oxygen species, are chemical compounds that have one or more unpaired electrons, allowing them to react quickly and unpredictably with nearly any nearby protein, fat, carbohydrate, or nucleic acid in a chemical reaction called oxidation (2). Agents that protect low-density lipoprotein from oxidation have been shown in a range of in vitro and animal models to reduce the development and progression of atherosclerosis. These agents include antioxidant micronutrients such as vitamin E. They have gained

wide interest because of the potential for prevention of atherosclerotic vascular disease in humans (13).

Vitamin E is found naturally in some foods, added to others, and available as a dietary supplement. "Vitamin E" is the collective name for a group of fat-soluble compounds with distinctive antioxidant activities (14).

Naturally occurring vitamin E exists in eight chemical forms (alpha-, beta-, gamma-, and delta-tocopherol and alpha-, beta-, gamma-, and delta-tocotrienol) that have varying levels of biological activity (14). Alpha-Tocopherol is the most prevalent of these, composing more than 90% of the tocopherols in animal tissues and displaying the most activity in vitro. While most of its functions have been thought to be related to antioxidation in the patient, new research has identified the hormonal effects of vitamin E. Homologues of alpha-tocopherol, for example, suppress arachidonic acid metabolism, and conjugates of vitamin E can affect cell signaling functions (15).

Vitamin E can modulate signal transduction and gene expression and thus affect many cellular reactions such as the proliferation of smooth muscle cells, the expression of cell adhesion and extra cellular matrix molecules, the production of superoxides by NADPH oxidase, the aggregation of platelets and the inflammatory response. Vitamin E may modulate the extracellular matrix environment by affecting the vascular smooth muscle cells differentiation and the expression of connective tissue proteins involved in vascular remodeling as well as the maintainence of vascular wall integreity (16).

The objective of the present study is to determine the role of antioxidant vitamin E in lowering hyperlipidemia particularly cholesterol and triglyceride levels.

MATERIALS AND METHODS

The present study was carried out on 20 locally bred rabbits weighing from 900 –1500 gram purchased from local market rabbit supplier. All animals were equally divided into 2 groups each comprising of 10 animals, 1 group was served as control and the second group was vitamin E treated.

The animals were caged in pair in iron cages. Before administration of drugs the rabbits were fed on 5 ml cholesterol rich diet twice daily orally for a period of one month in order to induce hypercholesterolemia. Along with the cholesterol rich diet animals were also given chow and tap water. All the animals were maintained under constant environment condition 21 ± 1°C and humidity (50-60%).

After day 30^{th}, the blood samples were drawn from animals in order to ensure that hypercholesterolemia has been induced. After inducing the hypercholestreolemia the effect of vitamin E has been studied.

The antioxidant dose of vitamin E i.e 400 IU/day= 600mg/day restores endothelial function in hyperlipidemia (17).

70 kg adult = 400 IU = 600 mg of vitamin E

1 kg = 8.57 mg of vitamin E

Hence the dose of vitamin E is 8.57mg/kg/day

The control group animals were given distilled water only. The dose of the drugs was given to the animals daily for a period of 42 days. During the course of treatments the animals were maintained on same cholesterol rich diet.

Before starting the dosing, the blood samples were collected from marginal ear vein of each control rabbit. The blood samples of the animals were then collected on day 42 to study the effect of drug.

After separation the of serum, cholesterol and triglyceride levels were analyzed within 3 hours of sample collection on Humalyzer 3000 (Semi-automatic chemistry analyzer Model # 16700 by Human Germany) using standard kits supplied by Human.

Statistical analysis

Comparison of difference of mean between control and vitamin E treated group was made by using student's t-test. A *p* value less than 0.05 was considered statistically significant and *p* value less than 0.005 was considered highly significant.

RESULTS

Table 1 showing the effect of vitamin E on cholesterol levels of rabbits. In control group the serum cholesterol level after inducing hypercholesterolemia was 100.66 ± 12.07 mg/dl which was reduced to 71.62 ± 6.37 with $p < 0.05$.

Table 2 showing the effect of vitamin E on triglyceride levels of rabbits. In control group the serum triglyceride level after inducing hypercholesterolemia was 161.69 ± 10.57 mg/dl which was reduced to 23.72 ± 3.59 with $p < 0.005$.

Table – 1: Effect of drugs on cholesterol level of rabbits

Drugs	Cholesterol mg/dl
	42 Days
Control	100.66±12.07
Vitamin. E	71.62±6.37

Values are mean ± S.E (n=10)

P<0.05* = Significant

P<0.01** = Moderately Significant

P<0.005*** = Highly Significant

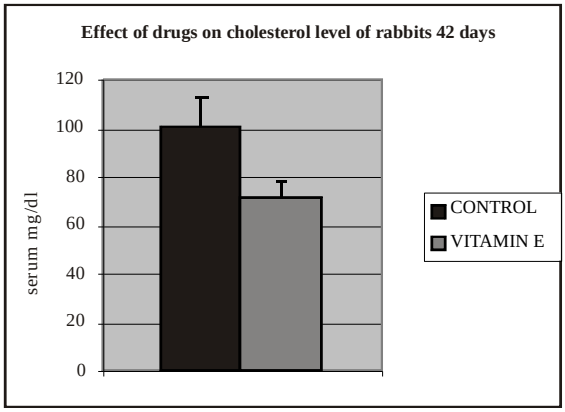


Table – 2: Effect of drugs on triglyceride level of rabbits

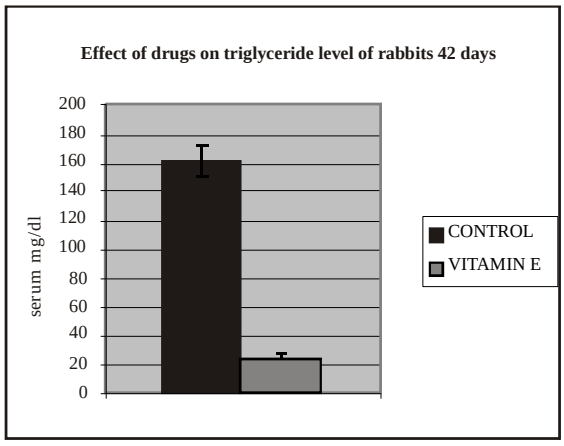
Drugs	Triglyceride mg/dl
	42 Days
Control	161.69±10.57
Vitamin. E	23.72±3.59

Values are mean ± S.E (n=10)

P<0.05* = Significant

P<0.01** = Moderately Significant

P<0.005*** = Highly Significant



DISCUSSION

A significant decrease in the level of cholesterol and triglyceride was observed in vitamin E treated group after day 42. Vitamin E and other antioxidants protect different structures against oxidative damage and lipid peroxidation, often measured as the production of malondialdehyde in plasma and tissues (18).

Alpha tocopherol is the most important lipid-soluble antioxidant that protects cell membranes from oxidation by reacting with lipid radicals produced in the lipid peroxidation chain reaction. Alpha tocopherol has properties of a peroxyl radical scavenger. The importance of this function is to maintain the integrity of long-chain polyunsaturated fatty acids in the membranes of cells and thus maintain their bioactivity (19).

As antioxidant, vitamin E acts in cell membranes which prevents the propagation of free radical reactions. Non-radical oxidation products are formed by the reaction between alpha-tocopheryl radical and other free radicals, which are conjugated to glucuronic acid and excreted through the bile or urine (20).

In addition to its activities as an antioxidant, vitamin E is involved in immune function and, as shown primarily by in vitro studies of cells, cell signaling, regulation of gene expression, and other metabolic processes (20). Alpha-tocopherol inhibits the activity of protein kinase C, an enzyme involved in cell proliferation and differentiation in smooth muscle cells, platelets, and monocytes. Protein kinase C inhibition by α-tocopherol is in part attributable to its attenuating effect on the generation of membrane-derived diacylglycerol, a lipid that facilitates protein kinase C translocation, thus increasing its activity.Vitamin E enrichment of endothelial cells downregulates the expression of intercellular cell adhesion molecule (ICAM-1) and vascular cell adhesion molecule-1 (VCAM-1), thereby decreasing the adhesion of blood cell components to the endothelium. Vitamin E also upregulates the expression of cytosolic phospholipase A_2 and cyclooxygenase-1. The enhanced expression of these two rate-limiting enzymes in the arachidonic acid cascade explains the observation that vitamin E, in a dose-dependent fashion, enhanced the release of prostacyclin, a potent vasodilator and inhibitor of platelet aggregation in humans (21).As we have discussed earlier that there is implication of inflammatory processes in atherosclerosis so all the above actions of vitamin E contributes in improving immune function, lowering inflammatory processes and hence eventually atherosclerosis.

In one study, the role of Vitamin E on CD36 expression in an in vivo model was investigated. Atherosclerosis was induced by 2% cholesterol containing Vitamin E poor diet. Three groups of six rabbits each were studied. The first group (control) was fed on Vitamin E poor diet. The second group was fed with Vitamin E poor diet containing 2% cholesterol and the rabbits in the third group were fed with Vitamin E poor diet containing 2% cholesterol and received injections of 50 mg/kg of Vitamin E I/M. After 4 weeks, aortas were removed and analyzed by light microscopy for atherosclerotic lesions. Aortic samples were analyzed for CD36 mRNA expression. The aortas of cholesterol-fed rabbits showed typical atherosclerotic lesions, detected by macroscopic and microscopic examination, and exhibited an increase in CD36 mRNA expression. Vitamin E fully prevented cholesterol induced atherosclerotic lesions and the induction of CD36

mRNA expression. The effects observed at the level of CD36 scavenger receptor expression in vivo suggest an involvement of reduced foam cell formation in the protective effect of Vitamin E against atherosclerosis (22). The above described all actions of vitamin E together contributes in lowering the cholesterol level in hypercholesterolemic rabbits.

The level of triglyceride was reduced highly significant than cholesterol levels. The effect of vitamin E may be due to the inhibition of fatty acid peroxidation with less formation of malondialdehyde and a larger amount of n-3 fatty acids in their sites of action in the liver, resulting in a greater decrease in the synthesis of triglyceride and fibrinogen (23). Vitamin E in the body not only protects unsaturated fatty acids from oxidation charges (24) but is also thought to have controlling influence on linoleyl and arachidonyl residues with in the membrane phospholipids, which cannot be explained by the antioxidant function of vitamin E (25). Besides its antioxidant effect vitamin E is thought to stabilize various membranes. It has also been reported that triglyceride levels might be more sensitive than cholesterol levels to the action of vitamin E (23). Lipoprotein lipase (a triglyceride hydrolase) is located on the walls of blood capillaries, anchored to the endothelium by negatively charged proteoglycan chains of heparin sulfate (26). We know that vitamin E has a role in improving vascular wall integrity therefore we can say that by improving the smooth muscle endothelium wall vitamin E improves the activity of lipoprotein lipase and hence with the passage of time i.e on 42nd day it was observed that vitamin E lowers the triglyceride level.

CONCLUSION

Vitamin E as an antioxidant can affect the cholesterol and triglyceride levels however further studies are recommended.

REFERENCES

1. Dipiro JT, Talbert RL, Yee GC, Matzke GR, Wells BG, Posey LM. A Pathophysiological Approach. In: Mc Graw Hills, editor. Pharmacotherapy. 5th ed. 2000. p. 300-319.
2. David EH, Jeffrey T, Kirchner DO. The role of vitamin E in the prevention of heart disease. Arch Fam Med 1999; 8:537-42.
3. Sharma VN. Essentials of pharmacology: Basic principles and general concepts. 3rd ed. CBS Publishers and Distributers; 2007. p. 267-71.
4. Kugiyama K, Kerns SA, Morrisett JD, Roberts R, Henry PD. Impairment of endothelium-dependent arterial relaxation by lysolecithin in modified low-density lipoproteins. Nature 1990; 344:160-62
5. Jilal I, Grundy S. Influence of antioxidant vitamins on LDL oxidation. Ann N Y Acad Sci 1992; 669:237–48.
6. Ross R. Atherosclerosis. An inflammatory disease. N Engl J Med 1999; 340:115–26.
7. Libby P. Molecular basis of the acute coronary syndromes. Circulation 1995; 91:2844–50.
8. Libby P, Hanson G. Biology of disease. Involvement of the immune system in atherogenesis. Current knowledge and unanswered questions. Lab Invest 1991; 64:5–13.
9. Rus H, Niculescu Z, Vlaicu R. TNF in human arterial wall with atherosclerosis. Atherosclerosis 1991; 89:247–54.
10. Mantovani A, Sozzani S, Introna M. Endothelial activation by cytokines. Ann N. Y Acad Sci 1997; 832:93–116.
11. Peiser L, Mukhopadhyay S, Gordon, S. Scavenger receptors in innate immunity. Curr Opin Immunol 2002; 14:123-28.
12. Janeway CA Jr, Medzhitov R. Innate immune recognition. Annu Rev Immunol 2000; 20:197-216.
13. Violi F, Cangemi R, Sabatino G and Pignatelli P. Vitamin E for the treatment of cardiovascular disease. Is there a future? Ann N Y Acad Sci 2004; 1031:292-304
14. Traber MG, Shils ME, Shike M, Ross, AC, Caballero B, Cousins R. Vitamin E In modern nutrition in health and disease. 10th ed. Lippincott Williams & Wilkins; 2006. p. 396-411.
15. Traber MG, Packer L.Vitamin E. Beyond antioxidant function. Am J Clin Nutr 1995; 62(suppl):1501S-1509S.
16. Villacorta L, Azzi A, Zingg JM. Regulatory role of vitamins E and C on extracellular matrix components of the vascular system. Elsevier 2007; 28 (5-6): 507-37.
17. Marguerite M E, Mary BE, Mary J M, Elisa YC, Monique CS, Steven MP, et al. Antioxidant vitamins C and E improve endothelial function in children with hyperlipidemia. Endothelial assessment of risk

from lipids in youth (EARLY) trial. Circulation 2003; 108:1059-1063

18. Gillman AG, Harman J G, Limbird LE et al. The pharmacological basis of therapeutics. In: Mc Grew Hills, editor. 10th ed. 2001. p. 972-92

19. Azzi A, Boscoboinik D, Marilley D, Ozer NK, Stauble B, Tasinato A. Vitamin E A sensor and an information transducer of the cell oxidation state. Am J Clin Nutr, 1995; 62(suppl):1337S-1346S.

20. Wang X, Quinn P. Vitamin E and its function in membranes. Prog Lipid Res 1999; 38 (4): 309 – 36.

21. Panel on Dietary Antioxidants and Related Compounds, Subcommittees on Upper Reference Levels of Nutrients and Interpretation and Uses of DRIs, Standing Committee on the Scientific Evaluation of Dietary Reference Intakes, Food and Nutrition Board, Institute of Medicine. Dietary Reference Intakes for Vitamin C, Vitamin E, Selenium, and Carotenoids. National Academy Press, ISBN: 978-0-309-06935-9, 2002; p 196.

22. Ozer NK, Negis Y, Aytan N, Villacorta L, Ricciarelli R, Zingg JM et al. Vitamin E inhibits CD36 scavenger receptor expression in hypercholesterolemic rabbits. Atherosclerosis 2006; 184(1): 15-20.

23. Haglund O, Luostarinen R, Wallin R, Wibell, L, Saldeen T. The Effects of Fish Oil on Triglycerides, Cholesterol, Fibrinogen and Malondialdehyde in Humans Supplemented with Vitamin E. JN 1990; 0022-3166/91.

24. Willson RL. Free radical protection. Why vitamin E, not vitamin C, beta carotene or glutathione? Ciba Foundation Symposium 101. Pitman Books, London, England; 1983. p. 19-44.

25 Diplock AT. The role of vitamin E in biological membranes. In: Porter R, Whelan J, editors. Biology of Vitamin E. Ciba Foundation Symposium 101. Pitman Books, London; 1983. p. 45-55.

26 Murray RK, Granner DK, Mayes PA, Rodwell VW. In: Mc Graw-Hill, editor. Harper's Biochemistry. 25th ed; 2000. p 272.

Address for Corresponding Author:
Saira Saeed Khan
e-mail: Shah-khan1983@hotmail.com

Original Article

An Audit of Post Operative Complications of Elective Abdominal Hysterectomies

1. Noor Nasir Khattak 2. Sumaira Yasmin 3. Muhammad Ishaq
4. Syed Hussain Shah 5. Saima Sajjad
1. Asstt Prof. of Gynae & Obst. 2. Registrar of Gynae Dept. 3. Prof. of Surgery 4. Asstt. Prof. of Medicine
5. Asstt Prof. of Gynae & Obst., Jinnah Medical College, Peshawar.

ABSTRACT

Objective: To record common post operative complications their risk factors.
Place and Duration of Study: Obstetrics and Gynaecology unit of DHQ hospital Timergara lower Dir, from 1/01/2006 till 30/12/2006.
Method: The complications were recorded on a pre constructed Performa showing demographic data of patient, history, general health, indication for operation and surgeon rank. The Patients were divided in to three groups: A, B & C.
Group – A: Complications occurring after operation with in the first 72 hours.
Group – B: Complications occurring after and 72 hours but with in hospital stay
Group – C: And complications recorded at follow up visit after 6 weeks.
Results: Our study showed the over all complications rate of 48.7% which is a significant rate, mortality were 4 out of 478 cases (8.36/1000).
Conclusion: The rate of complications was high in those women who had other associated medical problems, which can be reduced or avoided by Proper Pre-operative assessment, management and Technical factors under surgeon's control.

keywords:

INTRODUCTION

Clinical audit is a process by which patient care is improved; various aspects of patient care are compared against agreed standards, keeping track of personal out come data and contribution to a clinical data base, ensuring that a surgeon's own performance is monitored continuously. The audit is the systematic critical analysis of the quality of medical care including the procedures used for diagnosis and treatment, the use of resources and the resulting out come for the patients. A simple way of defining audit is to look at it as a set of questions like, what do we think we are doing? What we are really doing? How can we improve what we are doing [(1)].

The term "abdominal hysterectomy "means the removal of uterine body and the entire cervix with or with out its appendages through an abdominal route [(2, 3)]. This hysterectomy done by skilful gynaecologist, where the indication for hysterectomy is present, has been proved to be a health benefit for women in need [(4, 5, 6)]. Although, nowadays hysterectomy is generally considered safe, still several possible complications are associated with the procedure. These complications can result in mild to severe morbidity and even (although rare) mortality [(7)]. Post operative complication of any kind can occur at any time after the operation. It is important to be aware of the immediate & long term complications that can result from hysterectomy [(8, 9)]. There is no universally accepted standard of morbidity or definition of "major" or "serious" complication of hysterectomy. There is a need for a standard morbidity in surgical procedure is of utmost importance in order to find out post operative complication following hysterectomy. In our study patients were classified in to three groups.

1. Complications occurred with in the first 72 hours.
2. After first 72 hours but during the hospital stay.
3. Latter at 6 weeks post operative follow up visit.

Operative sequel was not included in our list of complications.

PATIENTS AND METHODS

This one year study was conducted in the obstetric and gynaecology unit of D.H.Q hospital Timergara Distt. Dir during 1st Jan 2006 till 31st December 2006. All patients who had elective hysterectomy with or with out salpingoopherectomy for various indications were included. All clinical details of patients including relevant information about past medical history, past Gynaecological management, base line investigations, blood grouping, full blood count, random blood sugar,

urine X-ray chest, serum urea, creatinine, abdomenopelvic, ultrasound etc. were recorded on a pre constructed Performa. Any associated disease e. g. diabetes, hypertension, respiratory problems were treated in collaboration with medical team, operator rank & post operative complications were recorded and patients were discharged between 5th -7th Post Operative day after receiving histopathology report . Out patient follow up were done after 6 weeks.

Post operative complications & its relation with age, parity, indication for operation, general health, expertise and rank of surgeon were analysed. Intra operative complications were not included in our list of complications. Antibiotic cover was given to all patients (100%).

RESULTS

During 1st Jan 2006 to 31st December 2006, 478 women had elective total abdominal Hysterectomy: 455 (95%) were operated for benign indications & 23(4.8%) were operated for various malignant indications. These operations were performed by consultant Gynaecologist (case=346) or medical officer (case=132) who were always assisted & supervised by senior colleague.

Table No.1: Indications of operation.

S.No	Indications	NO. of Patients	% Age
1	Fibroid	152	31.79%
2	Menorrhgia	119	24%
3	D.U.B	77	16.10%
4	End, hyperplasia (H/P based)	39	8.15%
5	Malignancies	23	4.81%
6	Polyps(end,cervical,placental)	15	3.13%
7	Benign ov,cysts	15	3.13%
8	Endometriosis of POD & ovaries	14	29%
9	Chronic pelvic pain	11	2.301%
10	Ca. endometrium	10	-
11	Ovarian malignancy	09	-
12	Bilateral ov cysts	04	0.83%
13	Hydatidiform mole	03	0.62%
14	End,hyperplasia&vag, decent	03	0.623%
15	Ca. Cervix	02	-
16	Intrauterine pregnancy with advanced ca ovary	01	-
17	Choreocarcenoma	01	-
18	Pyometera	01	0.2%
19	Primary amenorrhoea(cx agenesis)	01	0.2%
20	Mental retardation with end hyperplasia	01	29%

Complications rate were high among the cases operated by medical officers, the reason was probably long duration of operation, more tissue handling, more blood loss, poor quality of operative instruments, poor aseptic technique etc. Indications for Hystectomies were summarized in table-I. Majority of the women were of 40-59 years old as shown in table-2 (A). One hundred forty four cases were weighting up to 50 Kg, 188 patients were of 51-60kg-weight, as revealed in table (2-B). Many patients had associated medical problems like hypertension in 179 cases (table-3). Complications with in 72 hours are shown in table-4, after 72 hours to discharge from hospital in table-5 and late complications in table-6. Cases of mortality are given in table-7. Almost all patients complained of pain.

Table No. 2: Distribution of patients according to age & weight.

S. No	Age Groups	Cases	Wt of pt in Kilograms	Cases
1	Teenage	2	Up to 50 kg	144 (36)
2	20-29yr	19	51-60 kg	188(39)
3	30-39 yr	42	61-70 kg	120(25)
4	40-49 yr	258	>70 kg	26(5)
5	50-59 yr	143		
6	>60 yr	14		

Table No. 3: Distribution of patients according to associated medical problems.

PROBLEMS	NO OF PATIENTS	%AGE
Diabetes	18	3.76%
Hypertension	179	37.44%
Chronic chest infection	14	2.92%
Asthma	03	0.62%
Tuberculoses	02	0.41%
Peptic ulcer	03	0.62%
Steroid induced peptic ulcer	01	0.2%
Previous gynaecology surgeries	23	4.81%
{Sterilization=8 myomectomy=4 Caesarean section=6 Appendectomy=5}		

DISCUSSION

Hysterectomy has developed & evolved in the past 150 years from an extremely dangerous operation to a major therapeutic modality that can save life & improve health, assuming proper patient selection, preparation & skilful performance [6, 10]. Nowadays hysterectomy is one of the most frequently performed major operations for women of reproductive age. The vast majority of all hysterectomies are done abdominally even in countries with surgeon well trained in vaginal approach.

Table No. 4: Complications within the first 72 hours.

Complications	No. of Patients	%Age
1) primary haemorrhage(shock) re-operated for slipped ligature(o4) vaginal vault exploration with application of haemostatic stitches (02) thoracic out let syndrome (false perception of shock-01)	4 2 1 Total: 7	1.46%
2) evacuation of wound haematoma	01	0.2%
3)delayed recovery from anaesthesia	08	1.67%
4)delayed recovery needing intensive care &ventilators	02	0.41%
5) blood transfusion reaction	09	1.88%
{febrile reaction=7 allergic reaction=2}	-	-
6) Dyspnoea	13	2.71%
7) Vomiting	143	29.9%
8) Pain	300	62.76%
9) Febrile morbidity	108	22.5%
{source un identified=42 UTI =39 Abdominal incision infection=10 Upper respiratory tract infection=15 Pneumonia=01 Others=01}	-	-
10) life threatening events {pulmonary embolus/infarct=01 cardiopulmonary arrest=01}	02	0.47%
11)urinary retention	02	0.4%
12)illus	05	1.04%
13)gaseous distension	77	16.10%
14) hematemesis	03	0.627%
15) wound infection	111	23.22%
16)atelectasis	03	0.62%
17) pyodine skin burn	01	0.2%
18) pain/insomnia	307	64.62%

The chances of a women having hysterectomy by the age of 55 years is 20% &out of these 35- 64% will need hysterectomy because of menstrual abnormalities [4, 11, 12]. In our study most common age group was between 40- 50 years. Post operative complications were related to age of patients to some extent [13]. As the incidence of complication increases with increasing age, weight, poor general health, anaemia, diabetes, hypertension, chronic chest infection and malignancy etc.

Table No.5

Complications after 72 hours& during hospital stay
Febrile morbidity=233 (48.74%) {source unidentified=68 UTI=62 Abdominal skin infection=59 Vault haematoma=18 Pelvic cellulites=02 Upper respiratory tract infection=18 Pneumonia=02 Sepsis=03 Others=01}

Table No. 6: Complication at 6 week post operative follow up visit

Septic focus in skin incision	48	(10.04%)
No complaints	10	(2.09%)
Weakness	07	(1.46%)
Constipation	05	(1.04%)
Diarrhoea	03	(0.627%)
Fever	18	(3.76%)
Granulation tissue formation in vaginal vault	36	(7.53%)
Bleeding per vaginum (secondary haemorrhage)	15	(3.13%)
Vault haematoma	05	(1.04%)
Vault infection	02	(0.4%)
Readmission	21	(4.39%)
{for care of septic wound, abdominal distension, other GIT or urinary problems} lost for follow up	379	(79.27%)

Table No. 7: Causes of mortality:

Irreversible shock, primary haemorrhage
Pulmonary embolism
Septicaemia ,myocardial infarction
{Advanced carcinoma ovary with pulmonary embolism} total mortality=04 (0.83%) 08 per 1000 operations.

Among various indications for hysterectomies, uterine fibroid is the most frequently occurring uterine tumours and is the most common indication for hysterectomy [4, 5, 14, 15]. The large size and greater number of fibroid is associated with an increased risk of operative and post operative complications [16]. In this study n=152 (31.79%) of cases had fibroids. Menorrhogia affect approximately 22% of healthy women, the second most common indication for hysterectomy, in our study n=119 (24.8%) of cases had menstrual problems.

There is no universally accepted standard of morbidity [17]. Many investigators have used fever as an index of morbidity associated with gynaecological surgery, but their measure of fever has been varied,

similarly they have used different tests of non febrile complications usually with out any explanation.

We did this study to asses the risk of morbidity among all women under going elective hysterectomy in our unit although hysterectomy is relatively safe operation with a low mortality rate of only 0.6 per 1000 operations for benign indications [18]. But operative morbidity can be as high as 42.8%, when abdominal route is used [17]. In our study the over all complication rate was 48.7%.the complication rate is defined as the number of women with one or more complication per 100 women who underwent hysterectomy [8].

Infection is common post operative complication associated with hysterectomy, 6-25% of patients having abdominal hysterectomy develop infection post operatively [19, 20]. In all regardless of the careful precautions taken. Approximately one third of the women develop post op febrile infection [19].use of prophylactic antibiotics pre, intra or post operatively can greatly reduce infection occurring with hysterectomy. In our study the febrile morbidity was 22.59%, accounted for overall morbidity [21].

The most serious post operative complication of hysterectomy is haemorrhage which occur in 1- 3% of patients [13, 22, 23]. Although all patients are at risk, those having hysterectomy for gynaecological cancer, PID, or pelvic abscess, large fibroid, are at greater risk of developing post operative bleeding complications [15, 20].

In our analysis 0-83 % of women needed re-operation within the first 24 hours post operatively for slipped ligature, haemorrhage requiring transfusion was 1.46% .if post operative vaginal cuff bleeding occurs and is found to occur below the cuff, out patient suturing of the site will generally stop the bleeding. If the bleeding is above the vaginal cuff, further examination in operation theatre is warranted. If the patient when stabilised with intra-venous fluids, packed cell transfusion 2-4 units, the bleeding will generally stop and haematoma was formed, that will eventually be resolved in to the body [2, 13, 20].

In our study the rate of life threatening events i.e. post operative cardiac or respiratory arrest ,myocardial infarction, pulmonary infarction, embolism ,anaphylactic shock, disseminated intra vascular coagulation were not significant.

In this study most of the patients (n=400) were discharged from hospital on 5th post operative day after removal of stitches, while few (n=78) who were running temperature needed prolonged stay for further investigation and treatment, among women who had concurrent vaginal procedure developed urinary retention (0.41%).overall urinary tract infection occurred in 12.7% of all women.

Three of the patients had accidental urinary bladder injury during operation which were identified and repaired during surgery, as they had indwelling catheter for 2-3 weeks, were discharged after getting negative dye test.

Out of those who developed illus. (n=05) one was re operated for suspected forgotten surgical gauze, she latter developed severe wound sepsis and remained hospitalised for 31 days, while other patients with wound sepsis and wound dehiscence stayed for 18 days in hospital.

Other non categorised in-hospital complications atelectasis, fallopian tubes prolepses, thromboembolism, myocardial infarction, stroke, and renal failure can also occur [2, 13].

Long term complications i.e. early menopause is the result of hormone changes secondary to hysterectomy, early menopause can be associated with hysterectomy even when ovaries are retained [24]. Our study found that menopause occurred 4 years earlier in pre-menopausal women who underwent hysterectomy where both ovaries were retained as compared with similar women with out hysterectomy. One theory for this is decreased blood supply to ovaries, which disrupts their function resulting in improper production of sex hormone [25, 26].

Psychological effects that may manifest following hysterectomy vary from individual to individual. Some studies have found that women experience new feeling of depression, anxiety, decreased libido or social disruption due to lengthy post operative recovery. Other studies have concluded that women undergoing hysterectomy have improved quality of life because their previous unpleasant symptoms have been relieved.

The mortality rate associated with hysterectomy is low 0.6-1.6 per 1000 [10, 23]. Our recorded value was 04 cases out of 478 (8.3per 1000). It would have been zero or much reduced if the study would not have included the women with malignancies and other serious medical conditions like patient with cirrhosis of liver

The high complications rate of our study could be explained by the pre-existing condition, indication for hysterectomy, poor aseptic technique, and poor quality of our nursing care. This high complication rate and mortality was disappointing while the rate of readmission was 4.39% .and it was closer to 02-04% as reported by others following abdominal and vaginal hysterectomy.

Our analysis was also limited because the incidence of post operative morbidity and mortality is projected several years into the future, while our analysis was done mostly during the hospital stay. Therefore we can assume that the actual morbidity and mortality may be higher then the recorded values.

It is important for the patient and their physician to communicate regularly after Hysterectomy. Patients who experience on going depression after surgery should speak to health care provider to determine the need for counselling and or use of antidepressants.

CONCLUSION

Women who are at greater risk of post operative complication are those who are obese, older age group, anaemic, diabetic, hypertensive, from low socioeconomic status, with additional history of malignancy, experience or lack of experience of surgeon, excessive blood loss during surgery and long duration of surgery.

We could avoid complication like pyodine skin burn, sticking plaster allergies, wound infections, sepsis and weight related risk factors. Technical factors under surgeon control can significantly contribute to altered wound healing and wound problems. Although multiple complications may result from this procedure, it is important to keep in mind that most women are quite satisfied with the results of surgery and with significant relief from symptoms.

There is now increasing numbers of non surgical alternative to hysterectomy particularly for abnormal uterine bleeding and since this is the indication for hysterectomy in at least one third of cases. Recent treatment advances could bring the Hysterectomy rate down still further.

REFERENCES

1) Gambone JC, Reiter RC, Lench JB. Quality assurance indicators at short term out come of Hysterectomy. Obstet Gynecol 1990; 76:841.
2) Center for disease control & prevention. Women reproductive health. Hysterectomy fact sheet www.cde.gov/reproductive health./women RH/00-04-FS Hysterectomy.html. Accessed June 22, 2008
3) Dicker R C, Greenspan JR, Strauss L.T. Complication of abdominal & Vaginal Hysterectomy among women of reproductive age in United States. Am J Obstet Gynecol, 1982; 144: 841-845.
4) Black N; Clarkia, RoweP. A prospective cohort study of the clinical management of total abdominal hysterectomy for benign disease. J Obstet Gynecol 1995; 15:394.
5) Carleson KJ, Nichols D, Schiff 1. Indications for Hysterectomy N.Engl J.Med 1993; 328 - 856.
6) Farquhar CM, Sadler, Harvey SA, Stewart AW. The association of Hysterectomy & menopause. A prospective cohort study. Br J Obstet Gynecol, 2005; 112: 956-962.
7) Kovea SR, Hysterectomy out come in patient with similar indications Obstet Gynecol 2000; 45: 18-23.
8) Al-Kadre H.M, Al-Turki H-A, Saleh A Short &long term complications of abdominal and vaginal hysterectomy for disease. Saudi Med J.2002; 23(7): 806-15.
9) Carlson KJ Miller B A, Flower F J. The Maine women health study; 2 out come of Hysterectomy Obstet Gynecol 1994; 83:556-565.
10) John A, Rock-Howard W; Jones 3.telinde, s Operative Gynaecology (9thedition) Lippincott William &Wilkins 2003, (2) pp: 799-824.
11) Davies A; Hart; Magos A. Hysterectomy surgical route & complications. Eur J Obstet Gynecol 2002;104 : 1485 (104:148-151)
12) Dao AH, Cartwright PS. Fallopian tube prolapse following abdominal Hysterectomy J. Tenn Med Assoc. 1987; 80:141.
13) Falcon T, Cogan-Levy SC. Overview of Hysterectomy up to date on line 16.2.hpt; 11 utdol.com/on line/contact/topic key=gyn-surg/11669& selected title=1N 150 &source=search-result. Accessed June 22, 2008.
14) Bernstein S, Mc GlynnE, Sia A. For health maintenance organization, Quality of care consortium. The appropriation of Hysterectomy, a comparison of care in seven health plans JAMA 1993:269; 2398.
15) Cynthia M; Farequhr, M D. Frenzcog. Hysterectomy rate in the United States 1990-1997. Obstet Gynecol 2002, 99; 229-34.
16) Coulter A, Mc Phersonk, Vesey M British women under goes to many or too few Hysterectomy s o c sci Med 1988, 27, 987-94.
17) Dandade D; Malink LR wheeler. JM Therapeutic Gynaecological procedures. In; Decherney AH, Nathan L, Goodwin TM Laufer N, ed. Current diagnosis & treatment, Obstet Gynecol 10th ed. New York NY; Mc Graw-Hill Medical 2007.
18) Gimbal H, Zobbev, Anderson BM, Randomised control trial of total compared with subtotal Hysterectomy with one year follow up results.Br J Obstet Gynecol, 2003:110:1088.
19) Griffith-Jones MD, Jarvis GJ, MC Namare HM. Adverse urinary symptoms after total abdominal hysterectomy. Fact or fiction. BJU 1991; 67; 295.
20) Hillis S, March banks P, Peterson H, uterine size and risks of complications among women under going abdominal Hysterectomy for Leiomyomas. Obstet
21) Haris W. Early complications of abdominal & Vaginal Hysterectomy. Obstet Gynecol surv 1995; 50 : 795.
22) Chongosmchaic: Lumbigonon P. Placebo controlled double-blind randomised study of prohylacticantibiotics in elective abdominal Hysterectomy. J Hosp infact 2002:52(4):302-6.

23) Drife J. conserving the cervix at hysterectomy Br. J Obstet Gynecol 1994; 101:563.
24) KJerulf KH, Guzinski, GM; Langenberg PW, Hysterectomy & race. Obstet Gynecol 1993; 82:757-764.
25) Clarke A, Black N Rowe P; Indication for and out come of total abdominal Hysterectomy for benign disease. A prospective cohort study Br. J Obstet Gynecol 1995:102; 611.
26) Helstrom L, Lundberg PO, Sorbom D. Sexuality after Hysterectomy; a factor analysis of women's sexual lives before and after subtotal Hysterectomy. Obstet Gynecol 1993; 81:357.
27) Drife J. conserving the cervix at hysterectomy Br. J. Obstet Gynecol 1994; 101:563.

Address for Corresponding Author:
Prof. Dr. Muhammad Ishaq,
Department of Surgery,
Jinnah Medical College
Warsak Road, Peshawar.
Ph:92-91-5200246, 92-91-5201183
Fax: 92-91-5201836, E-mail: Info@jmcp.edu.pk

Original Article

Frequency of Malignancy in Benign enlarge prostate at Peoples Medical College Hospital Nawabshah

1. Ahsan Ali laghari 2. Altaf Ahmed Talpur 3. Abdul Razaque Qazi
4. Noor Muhammad Khaskheli 5. Akmal Jamal 6. Qarib Abass Shah
1. Asstt. Prof. of Surgery PMCH Nawabshah 2. Asstt. Prof. of Surgery, LUM&HC, Jamshoro
3. Assoc. Prof. of Surgery 4. Prof. of Surgery. PMCH Nawabshah
5. Prof. of Surgery, LUM&HC, Jamshoro 6. Prof. of Surgery, GMMM Collage Sukhur

ABSTRACT

Aim of Study: To determine the frequency of Malignancy in Benign enlarge prostate.
Study Design: Prospective observational study:
Place and Duration: Two years study from October 2008 to October 2010.
Was conducted in Peoples Medical College Nawabshah.
Patients and methods: The study comprises 50 patients all were admitted from OPD (Out Patients Department).
The patients were evaluated fully after history, clinical examination DRE and specific investigation of PSA X-ray Lumbo sacral spine Trans rectal, Endo luminal ultra sound flow metery Trans rectal biopsy C.T scan and Bone scan and General assessment. All Patients with enlarged prostate included out of 50 patients 48 patients under went surgery and tissue sent for histopathology.
Result: In this study of 50 patients of enlarge prostate total number of patients were in age group 55 to 75 years, Out of 50 patients 9 patients suspected malignant on the basis of DRE. But PSA will raise in 7 patients. Regarding the histopathology the results 7 patients showed malignancy adeno carcinoma.
Conclusion: Prostate carcinoma more common enlarged prostate as compared to fibro tic prostate.

Key words: Enlarged prostate carcinoma prostate, adeno carcinoma of prostate.

INTRODUCTION

Carcinoma of prostate constitutes a major health problem. It is the most common malignant tumor in men over the age of 65 years. It is estimated that lifetime risk of Western men having Carcinoma of prostate is about 30%. Approximately 50% of patients with metastasis disease dies within 2 years. 5 years survival rate is less than 15%.
Virtually all cancers are adeno carcinoma with the grade being indicated by the Gleason score.

Mostly patients present with obstructive symptoms as retention of urine, poor stream and irritative symptoms as frequency, urgency and incontinence. So, diagnostic techniques used in carcinoma of prostate have been evolved greatly with technological developments, but the classical digital rectal examination (DRE) is still the mainstay for the diagnosis of any prostates disease. The diagnosis has been based primarily on the ability of the index fingure of surgeon to detect mobility, asymmetry of the gland and hardness in the gland. The accuracy rate of digital rectal examination (DRE) in detecting malignancy is 20-40% in different size.

Investigations such as tumor marker, serum Prostate Specific Antigen (PSA) level, and biopsy via trans rectal ultra sound probe, are required for the diagnosis of Ca prostate, staging required consist Endo rectal Ultrasound, Computerized Tomography (CT) and Magnetic Resonance Imaging (MRI) for locally advanced disease. Liver function test, serum calcium, acid phosphates, X-Ray Lamb sacral Spain, Bone Marrow Cytology and Bone Scan For detection of bony metastasis.

Management depends largely on the stage of the disease. For localize prostate cancer, stage 1 and 2 treated by radical prostectomy can offer a cure. Side effects of surgery include erectile dysfunction and incontinence. Carcinoma of prostate is also radiosensitive can be given as external beam radio therapy of in the form of brechy therapy , hormonal therapy, such as LHRH analogues, and anti androgens are used in locally advance or stages 3 and 4 metastasic

disease. Hormones do not cure: but slow the progression of the cancer and gene therapy can be given.

Follow up consist of PSA, tumor surveillance ad other therapeutic options can be considered if the PSA starts to rise. Chemotherapy is increasingly being used for hormone escaped prostate cancer.

PATIENTS & METHODS

It was a prospective study carried out at surgical wards of People's Medical College Hospital, Nawabshah from October 2008 to October 2010.

Detailed history, clinical examination and Investigations were taken and recorded on a preformed designed for the study. Study variable used were age, nodularity of prostate, DRE findings, PSA ratio and Histopathological results. 50 Patient were included in the study with enlarged prostate. Fibro tic prostate, Hypertrophy of bladder neck were excluded. All the patients were investigated for, Blood sugar, blood Urea, Serum Electrolyte/ creatinine, Blood Complete Picture, Liver function test, serum calcium, acid Phosphates, PSA, X-ray chest, X-Ray Lumbo sacral spine, trans rectal , Endo luminal ultra sound, flow metery, trans rectal biopsy, C.T scan, Bone scan MRI and General assessment. Out of 50 patients 48 were under went surgery and tissue sent for histopathology.

Stestical package for social sciences SPSS version 10 was used for statistical analysis of the data.

RESULTS

This was a hospital based series study of 50 patients. The maximum numbers of patients were in age group of 55 to 75 years. The peak incidence of prostatic carcinoma seen in 65 years of age. Out of 50 patients, 15 patients were present increase frequency of micturation, 15 patients were present retention of urine, 10 patients were present bilateral inguinal hernia, 5 patient were present hematuria and 5 patients were present poor stream. (Table 1)

On DRE finding 43 patients (86%) prostate were feel soft to firm mucosa mobile, smooth, regular.7 Patients (14%) were suspicious malignant on the basis of DRE mucosa of prostate were fix, hard, irregular and asymmetrical. (Table 2)

PSA report were showed 30 patients (60%) were 6 n gm ml, 8 patients (16%) were 10 n gm ml. 5 patients (10%) were 15 n gm ml, 7 patients (14%) 20 – 30 n gm ml. Strongly proved malignant. (Table 3)

Ultra sound report of residual urine were showed 30 patients (60%) having 100 ml of residual urine.10 patients (20%) were 150 ml of residual urine , 5 patients (10%) were 200 ml of residual urine, 5 patient (10%) were 250 ml of residual urine (table 4)

48 patients under went surgery while 2 patients unfit for surgery, in which 43 patient (86%) were operated trans vesicle approach. 5 Patients (10%) were operated retro pubic approach .(Table 5)

Histropathological reports of 43 patients (86%) were showed normal prostate. 7 patients (14%) were adeno carcinoma of prostate. (Table 6)

Table 1: Patients presentation in BPH

Sign and Symptoms	No of Pts	Percentage
Frequency of urine	15	30%
Pretension of urine	15	30%
Bilateral inguinal hernia	10	20%
Hematuria	5	10%
Poor Stream	5	10%
Total	50	100%

Table 2: Digital rectal examination (BPH)

Mucosa soft, mobile smooth	43	86%
Mucosa fix hard irregular	7	14%
Total	50	100%

Table 3: Prostates specific antigen report

Level of PSA	NO Of Patients	Percentage
6 n gm ml	30	60%
10 n gm ml	8	16%
15 n gm ml	5	10%
20-30 n gm ml	7	14%
Total	50	100%

Table 4: Result of Abdominal ultra sound

Residual urine	No of Patients	Percentage
100 ml of residual urine	30	60%
150 ml of residual urine	10	20%
200 ml of residual urine	5	10%
250 ml of residual urine	5	10%
Total	50	100%

Table 5: Operative procedure

Operative procedure	No of Patients	Percentage
Trans vesicle approach	43	86%
Retro pubic approach	5	10%
Unfit for surgery	2	4%
Total	50	100%

Table 6: Histopathological report

Evidence of report	No of Patients	Percentage
Normal Report	43	86%
Adenocarcinoma of prostate	7	14%
Total	50	100%

DISCUSSION

Carcinoma of Prostate is regarded as the most common and frequent endocrine malignancy with a variable geographic and ethnic incidence all around the world (17). The overall incidence was reported to be increasing world wide with changing characteristics (1). A long standing and unresolved issue is whether benign enlarged prostate is significantly associated with carcinoma. In this study, 15 patients were present increase frequency of micturation, 15 patients were present retention of urine, 10 patients were present bilateral inguinal hernia, 5 patient were present hematuria and 5 patients were present poor stream. The diagnosis of malignancy in benign enlarged prostate is easily made by different methods such as DRE, PSA, Transrectal biopsy or Surgical excision , however the incidence of malignancy in benign enlarge prostate was reported in 1930 (11%), 1940s (7%).Bhatti et al observed incidence 4.5%.Hamid A observed incidence 4%, CKMHO et al observed in Arg. Arg genotype were also higher in the BPH 25.5% During this study incidence of malignancy were observed 7 patients (14%) out of 50 patients in benign enlarge prostate. In this study 43 patients were operated through Transevesical approach, 5 patients were operated through reteropubic approach and 2 patients not fit for surgery. Cooner et al were detection of malignancy in 14% of patients on the basis of PSA, DRE, Transerectal Ultra sound. Javed et al were detection of cancer in 6 % on basis of PSA, DRE, Transerectal Ultrasound. In this study cancer were detected on basis of DRE, PSA & Histopathological. Report.

CONCLUSION

Carcinoma of Prostate was more common in Benign enlarged prostate. Carcinoma of prostate was prevalent in Sixth decade of life. Adeno carcinoma was more common in benign enlarged prostate. Frequency was seen in 7 patients (14%).

REFERENCES

1. Neal D. The prostate and seminal vesicle. In: Mann CV, Russel RCG, Willium NS, editors. Bailey and loves short practice of surgery. 25th ed. 2008.
2. Gingell JC. The prostate and urethra. In: Cuschieri A, Giles GR, Moosa AR, editors, Essential surgical practice 4th ed 2006: 1510.
3. Brawer MK, chartner PC, Beatie J. Buchners DM, Robert L, screening for prostatic carcinoma with prostate specific antigen. J urol 2007; 147: 841-5.
4. Mucller EJ, Crain TW, Thompson IM, Rodrignez FR. An evolution of serial digital rectal examinations in screening for prostate cancer. J Urol 2006; 140: 1445-7.
5. Diagnosis of prostate cancer, personal view (editorial). J urol 2007; 147: 830.
6. Iqbal SA, Sial K, problems in the management of carcinoma of prostate.
7. Gorber GS, Chodak GW, Digital rectal examination in the early detection of prostatic cancer. Urol cl N Am 2002; 17: 739-41.
8. Rutknow IM, surgery: An Illustrated history 2002; 531-2.
9. Carten HB, Partn AW, diagnosis and staging of prostate cancer. In Walsh PC, Retik AB, Vaughan ED, Wein AJ, editors. Compbells urology 7th ed2003; 2519-34.
10. Low FC, Trauzzi SJ. Prostate acid phosphate in 2004, its limited clinical utility. Urol CIN Am 2008, 20: 589-93.
11. Brawer MK, Chetner MP, ultrasonography of the prostate and biopsy. In: Walsh PC, Retik AB, Vaughan ED, Wein AJ, editors. Campbells urology 8th ed. 2006: 2506-15.
12. Fuji Y, Higashi Y, Owarol F, Okuno T, Mizuno H. Magnetic resonance imaging for the diagnosis of prostate cancer metastasis to bone. Br J urol 2007;75:54-61.
13. Rossignol G..surgical techniques of retro pubic radical prostectomy. In: Khoury S, Chatelain C, Murphy G, Denisl, Merlai P, editors, Prostate cancer in questions, treatment 2008:21.
14. Pantelides ML, Lee LK, Brooman PJC. positive prostatic biopsy after radio therapy, does it matter. Br J urol 2006. 81, suppl 4:68-9.
15. Mc Connell JD. Physiologic basis of endocrine therapy for prostatic cancer. Urol CN Am 2007; 18:8.
16- Smith JA, scalletsky R. Further direction in tumor markers technology for prostate cancer. Urol Cin Am 2003; 20:771.
17- Perkins JJ, Sanson- Fisher RW, Clarke SJ, Youman P. an exploration of screening practice for prostate cancer and associated community expenditure. BVJ Urol 2006; 82: 524-9.

18- Smith JA, Scalletsky R. Future direction in tumor marker technology for prostate cancer. Urol CI N Am 1993; 20: 771.

19- Javaid MS, Tasneem RA, Akhtar MS, Manan A, Akhtar FK. Diagnosis of Carcinoma: The yield of serum PSA, DRE & TRUS. Pak J Surg 1996; 12: 91-4.

20- Bazinet M, Herr HW. The Patients, Disease status and Treatment options for localized prostate cancer: Stage T2a (B1) and T2b (B2). In: Khoury S, Chatelain C, Murphy G, Denis L, Mechali P, editors. Prostate Cancer in Question: Treatment, 1996: 153-9.

Address for Corresponding Author:
Dr. Ahsan Ali Laghari,
Assistant Professor of Surgery,
Surgical Unit 2,
PMCH, Nawabshah.

Original Article

Comparison of Pulmonary Function Tests in Smokers and Non-Smokers

1. Waseem Shafqat 2. Mahmood Nasir Malik 3. Shariq Sohail 4. Asaad Madni

1, 2. Assoc. Prof. of Medicine 3. Asstt. Prof. of Cardiology 4. PGR Medicine,
Allama Iqbal Medical College, Lahore

ABSTRACT

Purpose of Study: To compare the lung function tests in healthy non-smoker with age and sex matched smokers who are asymptomatic of respiratory impairment.

Materials and methods: This cross sectional analytic study was carried out from June 2009 to November 2009 in Department of Medicine and Pulmonology, Jinnah Hospital, Lahore. A total of 200 subjects were included in the study. All individuals were selected from healthy general public visiting Jinnah hospital Lahore as attendants of the patients.FVC, FEV1 and FEV1/FVC were measured and recorded in Performa. Data was entered and analyzed in SPSS 10.

Results: Mean age was 36.77+6.58 years. It was 34.11+7.38 in smokers and 33.43+5.39 in non-smokers group. Mean FEV1 was 2.55+0.79 in smokers and 3.52+0.55 in non-smokers. Mean FVC was 3.94+0.69 in smokers and 4.35+0.69 in non-smokes.

Conclusion: Smoking causes significant reduction in lung functions in asymptomatic smokers which can be prevented by quitting smoking.

Key Words: Pulmonary function test, Smoking, Lung diseases

INTRODUCTION

Smoking is quite prevalent in our society.[1]It is a serious public health problem in Pakistan. It declines pulmonary functions slowly and progressively and eventually causing COPD. It is estimated that smoking causes some 114,000 premature deaths every year[2], of which about a quarter are from lung cancer and around one fifth are from chronic obstructive lung disease -chronic bronchitis and emphysema.

Cigarette smoking is associated with a tenfold increase in the risk of dying from chronic obstructive lung disease. About 90% of all deaths from chronic obstructive lung diseases are attributable to cigarette smoking[3].

Around 90% of lung cancer cases in the UK are caused by tobacco smoking and in addition, tobacco smoking can also cause cancers of the following sites: upper aerodigestive tract (oral cavity, nasal cavity, nasal sinuses, pharynx, larynx and oesophagus), pancreas, stomach, liver, lower urinary tract (renal pelvis and bladder), kidney, uterine cervix and myeloid leukaemia[3]. Overall smoking is estimated to be responsible for approximately 30% of cancer deaths in developed countries.

Cessation of smoking, even for people who have been smoking for many years, has very significant health benefits. The cumulative risk of dying of lung cancer by age 75 for a life-long male smoker is 15.9%. For men who cease smoking at ages 60, 50, 40 and 30 years, their cumulative risk of dying from lung cancer falls to 9.9%, 6.0%, 3.0% and 1.7% respectively.

The diagnosis of respiratory diseases and the evaluation of their functional effect sometimes may be made by appropriate history taking and physical examination. However, in most instances applicable laboratory, radiological and bedside procedures are necessary for a definitive diagnosis, accurate functional assessment and close monitoring[4].

There are various methods[5] to evaluate the lung function in health and disease which range from simple bedside spirometry[6] to most modern computerized equipment. These tests include body plethysmography, diffusing lung capacity and arterial blood gases[7]. These tests help in diagnosis and management.

Pulmonary function tests (PFTs) provide objective means for determination of the presence or absence of functional impairment of the respiratory system and allow assessment of its severity, progression, and

response to therapeutic measures. These tests are essential in the diagnosis and management of asthma; however the results of the studies should always be interpreted in light of clinical information, and by considering their accuracy, sensitivity and specificity[6].

Spirometry is simple and easy to perform. It has both diagnostic and prognostic significance. It depends upon the age, sex and body size, FEV1 declines with age after 25 years[7]. Variation in ventilatory capacity of normal people may be due to ethnic origin, physical activity, posture of patient and co-operation.
Pulmonary function tests[7] include Tidal Volume(TV), Inspiratory Reserve Volume(IRV), Expiratory Reserve Volume(ERV), Inspiratory Capacity, Vital Capacity(VC), Function Residual Capacity(FRC), and Total Lung Capacity(TLC).

This study was designed to assess the effect of smoking on respiratory function tests in healthy asymptomatic smokers.

MATERIALS AND METHODS

This cross sectional analytic study was carried out from June 2009 to November 2009 in Department of Medicine and Pulmonology, Jinnah Hospital, Lahore. A total of 200 subjects were included in the study. All individuals were selected from healthy general public visiting Jinnah hospital Lahore as attendants of the patients.

RESULTS

Results are shown in the form of tables.

Table No.1: Measurement of PEFR in Smokers and Non-Smokers n=200

Age group Years	Smokers n=100	Non smoker n=100
18-34	n=56 5.03+1.40	n=53 6.87+1.62
35-44	n=24 5.29+1.78	n=26 6.95+1.40
45-65	n=20 3.27+1.06	n=21 6.54+0.62
Total	100	100

Table No.2: Forced Expiratory Volume in first second in smokers and non-smokers n=200

Age group Years	Smokers Mean FEV1+SD (Litres) n=100	Non smoker Mean FEV1+SD (Litres) n=100
18-34	n=56 2.73+0.74	n=53 3.54+0.47
35-44	n=24 2.56+0.55	n=26 3.54+0.58
45-65	n=20 1.92+0.44	n=21 3.02+0.052
Total	100	100

Table No. 3: Forced vital capacity in smokers and non smokers

Age group (Years)	Smokers n=100	Non smoker n=100
18-34	n=56 4.13+0.46	n=53 4.31+0.67
35-44	n=24 3.98+0.69	n=26 4.52+0.59
45-65	n=20 2.92+0.62	n=21 3.83+0.32
Total	100	100

Table No.4: Comparison of peak expiratory flow rate in smokers and non smokers

T –TEST

Age group (Years)	Smokers n=100	Non smoker n=100
18-34	n=56 mean PEFR=5.03 SD=1.40 SE Mean=0.18	n =53 mean PEFR=6.87 SD=1.62 SE Mean=0.19 P-VALUE= 0.000 Highly significant
35-44	n =24 mean PEFR=5.29 SD=1.78 SE Mean=0.33	n=26 mean PEFR=6.95 SD=1.40 SE Mean=1.40 P-VALUE= 0.000 Highly significant
45-65	n=20 mean PEFR=3.27 SD=1.06 SE Mean=0.31	n = 21 mean PEFR=6.54 SD=0.618 SE Mean=0.36 P-VALUE= 0.000 Highly significant
Total	100	100

DISCUSSION

In our study majority of the smokers (56%) were in the age group 18-34 years. Among the smokers, number of males was greater

than female. Majority of smokers smoke more than 20 cigarettes per day. Asymptomatic smokers have significantly reduced pulmonary function tests including peak expiratory flow rate (PEFR), forced expiratory volume in one second (FEV1), forced vital capacity (FVC) , and forced expiratory volume in first second /forced vital capacity(FEV1/FVC) showing obstructive pattern[8].

Table No.5: Comparison of forced expiratory volume in first second in smokers and non smokers

T –TEST

Age group (Years)	Smokers n=100	Non smoker n=100
18-34	n=56 mean FEV1=2.734 SD=0.748 SE Mean=0.097	n=53 mean FEV1=3.540 SD=0.585 SE Mean=0.069 P-VALUE= 0.000 Highly significant
35-44	n= 24 mean FEV1=2.568 SD=0.555 SE Mean=0.10	n=26 mean FEV1 =3.540 SD=0.472 SE Mean=0.094 P-VALUE= 0.000 Highly significant
45-65	n=20 mean FEV1=1.623 SD=0.446 SE Mean=0.13	n=21 mean FEV1 =3.02 SD=0.052 SE Mean=0.03 P-VALUE= 0.000 Highly significant
Total	100	100

Table No.6: Comparison of forced vital capacity in smokers and non smokers

T –TEST

Age group (Years)	Smokers n=100	Non smoker n=100
18-34	n=56 mean FVC=4.13 SD=0.461 SE Mean=0.06	n=53 mean FVC=4.319 SD=0.68 SE Mean=0.08 P-VALUE= 0.061 Non-significant
35-44	n=24 mean FVC=3.977 SD=0.693 SE Mean=0.13	n=26 mean FVC =4.516 SD=0.588 SE Mean=0.12 P-VALUE= 0.0033 Highly significant
45-65	n=20 mean FVC=2.927 SD=0.622 SE Mean=0.18	n=21 mean FVC =3.83 SD=0.0318 SE Mean=0.18 P-VALUE= 0.012 Significant
Total	100	100

Lubinski et al[9] performed study on 3004 subjects 18-23 years old. The analysis of influence of smoking on pulmonary function tests showed statistically significant decrease of total lung capacity (TLC), forced expiratory volume in first second(FEV1), FEV1%/VC, PEF and FEF50% in the smokers' group. Percentage of people with airflow limitation (FEV1%VC < 85% N, FEV1 < 80% N, FEF50 < 70% N) was two times higher than in the non-smokers' group. Smoking significantly increases the number of subjects with airflow limitation among healthy young male. Similar results were obtained in our study.

Aparici M, et al[10] determined the characteristics of spirometric performance in a group of smokers and to carry out a prospective study of the changes in ventilatory lung function after smoking withdrawal. The ventilatory lung function was studied in 90 smokers and 30 non-smokers. Afterwards the smokers were included in smoking withdrawal program. One year later, the ventilatory function tests were repeated in those individuals who were able to stop smoking. Respiratory function tests were likewise repeated in 10 subjects chosen randomly among those who were not able to stop smoking. The initial study of the ventilatory lung function showed that smokers had significantly lower values of FVC ($p < 0.001$), FEV1 ($p < 0.001$), FEVC1/FVC ($p < 0.001$), FEF25-75 ($p < 0.01$ and PEF ($p < 0.01$) compared to non-smokers. Likewise smokers also had a statistically significant higher prevalence rate of obstructive pulmonary disease ($p < 0.001$). Ventilatory function studies performed one year after smoking withdrawal on those who were able to stop smoking showed a significant improvement of respiratory function parameters compared to studies done one year before. There was also a significant decrease in the prevalence and severity of obstructive

pulmonary disease. No differences were observed in the ventilatory function tests performed on the ten subjects who did not stop smoking. From these data i suggest that tobacco consumption produces obstruction of the airways that can be reverted, at least in part, after smoking withdrawal.

Kanner RE et al[11]evaluated the effects of smoking-cessation intervention in early chronic obstructive pulmonary disease (COPD) on the symptoms of chronic cough, chronic phlegm production, wheezing and shortness of breath, and determined the effects of quitting smoking on forced expiratory volume in one second(FEV1) and forced expiratory volume in the first second as a percentage of forced vital capacity (FEV1/FVC) .

A total of 5,887 male and female smokers 35 to 60 years of age with early chronic obstructive air way disease (COPD) [defined as a forced expiratory volume in the first second (FEV1) of 55% to 90% of predicted and FEV1/forced vital capacity (FVC) <0.70] were enrolled in a 5-year clinical trial. Two-thirds of participants were randomly assigned to smoking-intervention groups and one-third to a usual-care group. The intervention groups attended 12 intensive smoking-cessation sessions that included behavior modification techniques and the use of nicotine chewing gum. Smoking status was biochemically validated by salivary cotinine measurements or exhaled carbon monoxide values. At the end of the study, sustained quitters had the lowest prevalence of all four symptoms, whereas continuous smokers had the greatest prevalence of these symptoms. Changes in symptoms occurred primarily in the first year after smoking cessation.

Respiratory symptoms were associated with greater declines in forced expiratory volume in one second(FEV1) during the study (P <0.001). In this prospective randomized trial using an intention-to-treat analysis, smokers with early chronic obstructive pulmonary disease (COPD) who were assigned to a smoking-cessation intervention had fewer respiratory symptoms after 5 years of follow-up[12].

Reductioninpulmonary function tests including peak expiratory flow rate (PEFR), forced expiratory volume in the first second (FEV1), forced vital capacity (FVC) , and forced expiratory volume in the first second as a percentage of forced vital capacity(FEV1/FVC) was more in smokers with high (>7.5)pack years than in those with low (<7.5) pack-years.

CONCLUSION

Smoking causes significant reduction in lung functions in asymptomatic healthy smokers as compared to asymptomatic healthy non-smokers which can be prevented by quitting smoking.

REFERENCES

1. Adil MM, Zubair M, Khan UA. Prevalence of smoking in various cities of Pakistan. Rawal Med J 2005; 30:74-5.
2. Smoking Statistics. British Heart Foundation, January 2004 www.heartstats.org.
3. Zurdari KM, Sahto MM, Ahmed TS, Rahu AA, Badar A. Pulmonary function tests in chronic obstructive pulmonary disease with and without cardiac failure. J Ayub Med CollAbottabad 1999;11:17-9.
4. Ayoob Z, AnsariAK, Akhtar R. Pulmonary function tests in heroin addicts at Karachi. Med Channel 2001; 7:11-4.
5. Holten KB. Revisiting spirometry for the diagnosis of COPD. J FamPract. 2006 ; 55:51.
6. Manzar S. Appropriateness of blood gas analysis in newborns with respiratory distress. Pak J Med Sci 2004; 20:33-5.
7. Spergel JM, Fogg MI, Bokszczanin-Knosala A. Correlation of exhaled nitric oxide, spirometry and asthma symptoms. Asthma 2005; 42:879-83.
8. Lokke, A, Lange, P, Scharling, H, et al. Developing COPD: a 25 year follow up study of the general population. Thorax 2006; 61:935
9. Lubiński W, Targowski T, Frank-PiskorskaA.Evaluation of the influence of tobacco smoking onpulmonary function in youg men. PneumonolAlergolPol2000;68(5-6):22631.
10. Aparici M, Fernández González AL, Alegría E. Respiratory function tests. Differences between smokers and non-smokers. Effects of withdrawal.Rev ClinEsp1993; 192:169-72.
11. Kanner RE, Connett JE, Williams DE, Buist AS. Effects of randomized assignment to a smoking cessation intervention and changes in smoking habits on respiratory symptoms in smokers with early chronic obstructive pulmonary disease: the Lung Health Study.Am J Med. 1999;106:410-6.
12. Van Durme, YM, Verhamme, KM, Stijnen, T, et al. Prevalence, Incidence, and Lifetime Risk for the Development of COPD in the Elderly: The Rotterdam Study. Chest 2009; 135:368.

Address for Corresponding Author:
Dr. Waseem Shafqat,
Associate Professor,
Department of Medicine,
Jinnah Hospital, Lahore.

Original Article

Epidemiology of Chronic Hepatitis B in Mansehra District, Hazara Division

1. Muhammad Jalal 2. Miss Nazima Rafique 3. Abdul Najeeb Khan

1. Asstt. Prof. of Biochemistry 2. Lecturer of Biochemistry 3. Assoc. Prof. of Physiology, Frontier Medical College, Abbottabad

ABSTRACT

Objective: The aim of this study was focused on the distribution, determinants and dynamics of chronic hepatitis B in a specified population of Mansehra district. The application of this study is to control the health problem.
Design of study: Original prospective observational study.
Methodology: The prospective study was carried out in Shahina Jamil teaching hospital Abbottabad.
Time period: 1st Jaunary 2005 to 1st june2008. All chronic patient (disease lasting for more than three months) were screened for hepatitis B. Redox kit (made in china) was used. Total three hundred people were screened belonging to Mansehra only.
Results: It showed that chronic hepatitis B is fairly common (35%) in Mansehra with the age group of 15-70 year. More common in male and Male to female ratio is 3:1. It was also found that the disease is more common in low socioeconomic group and in labors mostly stayed away from family for a long time. **Conclusion:** Our study found that the hepatitis B is more common in Mansehra with incidence of 3.5% in NWFP. The rate is high in male. The knowledge of people about hepatitis B is inadequate. Hence a mandatory vaccination and health education is recommended.

Key words: Hepatitis B, Mansehra, NWFP.

INTRODUCTION

Hepatitis B is a common global health problem and is spreading rapidly in Developing countries due to lack of health education, poverty and illiteracy[1] Chronic hepatitis B is an infectious disease of liver and is caused by a hepadnavirus; nearly 400 million people are infected by this virus worldwide. 1.2 million are infected only in USA[2] Majority of these patients are asymptomatic and pose great danger of spreading these infections to the society and medical personnel particularly.[3] Both Hepatitis B is transmitted through blood either by percutaneous or body fluids (semen, saliva or vaginal secretion).[4,5]. This infection present with malaise, anorexia, abdominal pain and jaundice but some time there are no symptoms till the development of cirrhosis.[6,7]There is vaccine available for hepatitis B which is now incorporated in immunization schedule all over the world and it is expected that its incidence will decrease.[8] Almost two billion people are infected with hepatitis B and more than 350 million have life long chronic liver infection.[8] Hepatitis B virus circulates in high titres in blood and lower titers in other body fluids and is hundred times more infectious than HIV infections and ten times more than HCV.[8] Prevalence of hepatitis B is 4 times higher in black as compared to whites (11.9% compare to 2.6%)[9]. It is estimated that 50% of male carriers and 14% of female carriers will eventually die of the complications of cirrhosis and hepatocellular carcinoma.[10] Pakistan is in the intermediate HBV prevalence area with a carrier rate of 3–4%[11]. Chronic hepatitis B is a serious problem in Pakistan [12, 13.] In Pakistan, HBV infection rate is increasing day by day.[14] The incidence of hepatitis B is significantly high. A study conducted in Pakistan showed that 31% cases of acute viral hepatitis, 60% cases of chronic liver disease and 59% of hepatocellular carcinoma are due to HBV infection.[15] The purpose of this study was to assess the epidemiology of chronic hepatitis B in Mansehra district, Hazara Division.

MATERIALS AND METHODS

The study period was three years extending from 1st Jaunary 2005 to 1st June 2008. Three hundred (300 patients with symptoms of chronic liver disease were screened. All these patients belonged to Mansehra district of Hazara Division. The age varied from 15 to 70 years. A total of 187 males and 113 females'

patients were tested. Redox kit (made in china) was used.

RESULTS

Out of 300 patients screened 227(75.5%) were male, and 73(24.5%) were females. So hepatitis ratio among male and female was 3:1.It was noticed that the hepatitis B was more prominent (79.6%) in middle age patients than (20.4%) Youngers. Socioeconomically the poor people (barbers, drivers and labors) were more effected (71.4%) than well off people (28.6%).The rate of hepatitis was higher (69.8%) in urban areas of Mansehra than rural area (30.2%). The complications of hepatitis B showed that 1% cases of cirrhosis and 0.3 % cases of carcinoma was appeared during study period. People were not immunized prior to disease.

	Number	**%age**
Total patients	300	100

Distribution of hepatitis B among peoples

Sex	male	227(75.5%)
	female	73(24.5%)
Age	15-25	24.5%
	25-70	79.6%
Occupation	Drivers	38.2%
	Labors	31.6%
	Barbers	18.1%
Area	Urban	69.8%
	Rural	30.2%
Complications	Cirrhosis	1%
	Carcinoma	0.3 %
Immunization	Not done	

DISCUSSION

Pakistan lies between middle to low income countries with over one-twelfth of labor force is unemployed, over one third of the population subsists in poverty and over half the population is illiterate, with parts of the country being worse than what the national average indicates [16.] As Mansehra is a district of NWFP with 1.7 million populations, its adjacent areas are Azad Kashmir, Kohistan, Swat and Abbottabad. The source of income of the most of the people is agriculture, but majority of the people serving in hotels and restaurants, as labour and driver in cities. The study was conducted only on patients with chronic illness of all age group and sexes.

The study was conducted with redox kit but not confirmed with ELISA test. Chronic hepatitis B effect 400million people worldwide. It is estimated that 50% of male carriers and 14% of female carriers will eventually die of the complications of cirrhosis and hepatocellular carcinoma.[17]

In Pakistan various studies were conducted. Theses studies were hospitals as well as clinical based. The mode of transmission of 5 lac people in NWFP is inoculation, sexual contact, improper screened blood transfusion, unsterilized syringes and unsafe dental procedure.[18] In NWFP high HBV prevalence was seen in Upper Dir (5%), Lower Dir (3.2%) and Bannu (2.7%). [18]

It was found that the distribution of chronic hepatitis B in Mansehra district had got a highest prevalence and more common between age group15-50. The male to female ratio is 3:1.the people with poor socioeconomic status were affected more than the other satisfactory people.

- The determinants are highest due to sexual contacts among drivers and labors.
- The drug addicts constitute the secondary determinants
- The blood transfusion, tattooing, piercing of nose, ear and other causes were least.
- Only few cases (3%) develop cirrhosis.
- One case of liver carcinoma was noticed.
- No vaccination was available in this district.

The measures which can reduce the incidence are

- Vaccination by government agencies.
- Health education of peoples by related health department.
- Proper screening of blood and blood products must be carried out before transfusion.
- Disposable syringes and razors must be promoted.
- Proper sterilization of surgical and dental instruments must be carried out.

REFERENCES

1. Khan SM, Jamil M, Jan S, Zardad S, Sultan S, et al. Prevalence of Hepatitis 'B' and 'C' in Orthopaedics Patients at Ayub Teaching Hospital Abbottabad J Ayub Med Coll Abbottabad 2007;19(4)
2. Locarnini S, Molecular virology of hepatitis B virus. Semin. Liver Dis 2004: 24 Suppl 1: 3–10.
3. Choudhary IA, Khan SA, Samiullah. Should we do hepatitis B and C screening on each patient before surgery. Pak J Med Sci 2005;21:278–80.
4. Weiss EC, Makary MA, Wang T, Syin D, Pronovost PJ, Chang D, et al. Prevalance of blood borne pathogens in an Urban, University-based general surgical practice. Ann Surg 2005; (5) 241:803–5.
5. Erden S, Bryukazturk S, Langer S, Yilmaz G, Palanduz T, Badur S. A study of serological markers of hepatitis B and C viruses in Istanbul

Turkey. Medical principles and practice. Intl J Kuwait Univ Health Sci 2003;12(3):184–8.
6. Russel RCG. The liver. Williams NS, Bulstrode CJK, editors. In: Bailey & Loves' Short Practice of Surgery, 24th ed. London: Chapman & Hall; 2004. P. 1076.
7. Cuschieri SA, Steele RJC, Moosa AR, editors. Essential Surgical practice, 4th ed. London: Arnold; 2002.
8. Hayes PC, Sympson K J, Garden OJ, editors. Davidson's Principles and practice of Medicine; 19th ed. Philadelphia: Churchill Livingstone; 2002.
9. MC Quillan G M, Coleman P, Kruszon-Moran D, Moyer LA, Lambert SB, Margolis HS. Prevalence of Hepatitis B infection in the United States: The national health and nutrition examination surveys, 1976–1994, Am J Public health 1999;89:14–8
10. Beasley PR. Hepatitis B virus as the etiologic agent in hepatocellular carcinoma — epidemiologic considerations. Hepatology 1982; 2: Suppl: 21S-26S. 2
11. Andre F: Hepatitis B epidemiology in Asia: the Middle East and Africa. *Vaccine* 2000, 18((Suppl) 1):S20-2.
12. Khan AA, Rehman KU, Haider Z, Shafqat F: Sero-markers of hepatitis B and C in patients with cirrhosis. J Coll Phys Surg Pak 2002, 12:105-107.
13. Umar M, Bushra HT, Younis N, Bashir N: Clinical spectrum of chronic liver disease due to HBV, HCV and dual infection – a comparative study. *Pak J Gastroenterol* 1999, 13:1-3.
14. Alam MM,[1] Zaidi ZS, [2] Malik AS,[3] Shaukat S,[1] Naeem A,[1] Sharif A,[1] et al. Molecular epidemiology of Hepatitis B virus genotypes in Pakistan. BMC Infect Dis. 2007; 7: 115.
15. Zuberi SJ. Seroepidemiology of HBV/HBC in Pakistan. Int Hepatol Comm 1996; 5:19-26.
16. Qureshi M, Bengali K. The State of Education. in Social Development in Pakistan. Annual review 2002–2003. Social Policy and Development Centre Karachi, Times Press: iii-iv;
17. Beasley PR. Hepatitis B virus as the etiologic agent in hepatocellular carcinoma — epidemiologic considerations. Hepatology 1982; 2:Suppl: 21S-26S.
18. Prevalence of Hepatitis B&C, Pakistan Medical Research Council.

Address for Corresponding Author:
Dr. Muhammad Jalal,
Assistant Professor,
Biochemistry Department, Frontier Medical College,
Abbottabad, Pakistan.

Original Article

Frequency of Refractive Error in Children of District Abbottabad

1. Amir Zeb 2. A. Hamid 3. F. Uppal 4. A. Awan

1. Asstt. Prof. of Eye Dept. FMC 2. Prof. of Forensic Dept. FMC 3. Prof. of Eye Dept. FMC
4. Prof. of Eye Dept. AIMC, Abbottabad

ABSTRACT

Objectives: To investigate the prevalence of refractive errors in children.
Design and Place of Study: A descriptive case series study of 10,000 patients conducted in the department of ophthalmology Shahina Jamil Teaching Hospital Frontier Medical College Abbottabad. 10-15 years old children of district Abbottabad were initially screened. Children identified to have visual acuity equal to or less then 6/12 underwent refraction with autorefractor (with cycloplegic where needed) and were prescribed glasses.
Duration of Study: From 2008-2009.
Outcome Measure: Proportion of children with Myopia, Hpermetropia and Astigmatism.
Results: A total of 10,000 children were screened.4.7 % of the total children screened had impaired visual acuity while 4.35% were found to have refractive errors. Prevalence of refractive error was found slightly more common among females. Myopia was found to be three times more common 3.33% than hypermetropia (1.00%) overall prevalence of astigmatism was found to be (1.78 %).
Conclusion: Refractive errors are significant cause of visual disability in children. Medical staff can effectively identify those children with poor vision for refraction and spectacles.

keywords: Myopia, Astigmatism, HYPERMETROPIA, and Aphakia.

INTRODUCTION

Refractive error[1] is found to be 2.3 billion world wide. 500 million people including many children with uncorrected error cause either blindness or impaired vision. Refractive error remains under corrected in 50% of cases[2]. In the last fifty years there has been four-fold increase in myopia[3].

In Pakistan 11.4% of the blindness is due to refractive errors including aphakia[4]. This amount of blindness suggests that eye care services are inadequate.

PATIENTS AND METHODS

This study is based on the screening results of children from 2008 to 2009. A total of 10,000 children were screened during this period. Children belonged to rural and urban areas of district Abbottabad.

Children with visual acuity of 6/12 or worse were registered. Ophthalmic equipment comprised of trail box, ophthalmoscope, retinoscope, aotrorefractometer and slitlamp. Children underwent eye examination and refraction followed by prescription of spectacles where needed.

RESULTS

Total of 10,000 children screened over a period of 2 years. The age range was from 10-15 years. 56% were male children while 44% were females. (56,00 and 44,00 respectively). Number of children identified to have impaired visual acuity was 470 or 4.70% of the total children screened 53% of children had visual acuity between 6/12 to 6/18. 4.35% or 435 were found to have refractive errors including 2 children with Aphakia. Prevalence of refractive errors was found to be slightly more common among females (4.20 % or 200 out of 44,00 females then in male children (4.20 % or 235 out of 56,00 male children) table 1. Myopia (both spherical and cylindrical was found to be three time more common (3.33 %) than hypermetropia (1.00 % both spherical and cylindrical) overall prevalence of astigmatism (both myopic and hypermetropic) was found to be 1.83 % (Table 1 and 2).

Table-1: Break-OD of refractive error –435 children

Type of Refractive Error	Male	Female	Total
Myopia	177	156	333 (76.55%)
Hpermetropia	55	45	100 (22.99%)
Aphakia	1	1	2 (0.48%)
Total	233 (53.56%)	202 (46.44%)	435 (100%)

Table-2: Prevalence of refractive errors in 10,000 school children

Type of Refractive error	Prevalence	Number
Overall prevalence of Refractive error	4.35 %	435
Myopia	3.33%	333
Simple	1.82%	182
Astigmatic	1.51%	151
HYPERMETROPIA	1.00%	100
Simple	0.68%	68
Astigmatic	0.32%	32
APHAKIA	0.02%	2

DISCUSSION

Prevalence of 4.35% of refractive errors in children population is an indicator for burden of effectively treatable visual impairment in children. With 58 million children up to 15 years of age[5] there could be 2.5 million children in need of spectacle correction in Pakistan. Survey of blindness[6] has shown refractive errors including Aphakia to be the third commonest cause of blindness in Pakistan (11.4 %) behind cataract (66.7%) and corneal opacity (12.6 %). An Indian study has found that refractive errors were responsible 12.5% of the blindness[7]and 59.4% of moderate visual impairment[8]. An Australian study[9] has found out refractive error to be the fourth most common cause of blindness.

A study carried out by Al-Shifa[10] has found out that 4.46 % of blindness in school children was because of refractive error. Uncorrected myopia and Aphakia were responsible for 3% of blindness in school children in Zimbabwe[11]. Uncorrected Aphakia and amblyopia were responsible for 5.1% blindness among blind school children in india[12].76.00% of the refractive error in our study was Myopia some other studies have shown myopia to be almost the only refractive error[13, 14]. Refractive error studies in children have shown prevalence of myopia 3.4% in chile[15], less than 3 % in Nepal[16] and not presenting that age in china[17]. The prevalence of myopia has also increased in both Singapore and Japan[17, 18].Studies of the population in Singapore[19, 20] showed varying rates of myopia.

REFERENECES

1. Holden BA, sulaiman S, KnoxK. The challenge of Providing spectacles in the Developing world. Journal of community Eye Health 2000;13(33):9-1.
2. MacCarty CA, Taylor HR. Editorial : Myopia and vision 2020. AmJ Ophthalmol 2000; 129(4): 525-7.
3. Saw SM, Katz J, Schein OD, Chan TK. Epidemiology of myopia. Epidemiol Rev 1996; 18: 175-87.
4. National Committee for Prevention of Blindness, Ministry of Health , Special Education and Social Welfare Islamabad, Pakistan National Programme for the Prevention of Blindness FIRST five Year Plan 1994-98: p24.
5. Government of Pakistan, Economic Advisers Wing, Finance Division Islamabad. Economic Survey Statistical Supplement 2000-2001: Pp248.
6. Afghani T, Akmal M, Ali H. refractive Error Study of One Million Children Pak J Ophthalmol 2003; 19 (4): 101-7.
7. Dandona L, Dandona R, Naduvilath TJ, Srinavas M, Mc Carty CA. Rao GN. Is current eye care policy focus almost In India? Lancet 1998;351:1312-16.
8. DandonaL, Dandona R, Naduvilath TJ, Srinavas M, McCarty CA, Rao GN. Burden of Moderate Visval impairment in an Urban population in Southren India. Opthalmology 1999;106:497-504.
9. Weih LM, Van Newkirk R, Mc CartyCA, Taylor HR. Age specific casuses of bilaterail visual impairment. Arch Opthalmol 2000;118:264-9.
10. Afghani T. Causes of Childhood Blindnesss and severe visual impairment survey of the Blind children froma a Rural Population and schools for the Blind in an Urban Area. Pak J Opthalmol 2000; 16(1): 4-25.
11. Schwab L, KagameK. Blindness in Africa: Zimbabwe Schools for the blind survey. Br J ophthalmol 1993; 77:410-2.
12. Rahi JS, Sripathi S, Gilbert CE, Foster A. Childhood blindness in India: Causes in 1318 blind School Students I nine states. Eye 1995; 9: 545-50.
13. Lin LLJ, Hung PT, Ko LS, Hou PK. Study of myopia among aboriginal suppl 1988; 185: 34-6.
14. Cumming GE. Vision Screening in junior schools. Public Health 1996; 110(6): 369-72.
15. Maul E, Barroso S, Munoz SR, SperdutoRD, Ellwein LB. Refractive Error Study in Children: results from La Florida, Chile.AmJ Ophthalmol 2000;129:445-54.
16. Pok harel GP, Negrel AD, Munoz SR, Elhwein LB, Refractive Error Study in children: results from Mechi Zone, Nepal. AmJ Ophthalmol 2000; 129:436-44.

17. ZhaoJ, Pan X, SuiR, Munoz SR, Sperduto RD, Ellwein LB. Refractive Error Study in children: results from Shunyi District, China. AmJ Ophthalmol 2000;129:427-35.
18. Ling SL, chen AJ, Rajan U, Cheah WM. Myopia in ten year old children: a case control study. Singapore Med 1987; 28:288-92.
19. Matsumura H, Hirai H. prevalence of Myopia and refractive changes in students from 3 to 17 years of age. Surv Ophtalmol 1999; 44 (Suppl 1) S 109-15.
20. ChowYC,Dhillon B, Chew PT, Chew SJ. Refractive errors in Singapore Medical Students. Singapore Med J 1990; 31: 472 –3.

Address for Corresponding Author:
Amir Zeb,
Assistant Professor,
Eye Department,
Frontier Medical College,
Abbottabad.

CORRIGENDUM

The original article namely "Ureteric Injuries in Gynaecological Surgery: An Experience of 19 Cases" published in Volume 21 No.12, December 2010, the designations of authors No. 2 and 3 may read as Nasim-ul-Majeed, Dean/Principal & Prof. of Surgery, FUMC, Rawalpindi and Sami Ullah, Asstt. Prof. of Surgery, FUMC, Rawalpindi.

Editor.

Original Article

Assessment of Microalbuminuria Levels in Hypertensive Patients

1. Zulfiqar Ali Shaikh 2. Kelash Nankani 3. Amar Dudani

1. Asst. Prof. of Community Medicine 2. Asst. Prof. of Physiology, DIMC/ DUHS, Karachi

3. Asst. Prof. of Physiology, CMC, Larkana

ABSTRACT

Objective: To evaluate association of microalbuminuria levels with severity of hypertension

Study Design: Cross-Sectional

Place and Duration: This study was conducted at department of Physiology Basic Medical Sciences Institute in collaboration with Medical ward-7 of Jinnah Post-Graduate Medical Centre, Karachi from January 10, 2005 to June 20, 2005.

Subjects and Methods: This study was conducted on 60 subjects classified into following groups. Thirty healthy normal volunteers were studied as control group, (group A). Thirty hypertensive patients included in (group B), were subdivided into B-l (mild hypertensive, Systolic Blood Pressure 140-159mmHg / Diastolic BP 90-99mmHg) and B-2 (moderate hypertensive, SBP 160-179 mmHg / DBP 100-109 mmHg). These sub-groups consisted of 15 subjects each. The parameters included the SBP, DBP, and Mean Arterial Pressure, urinary albumin excretion. Clinical details were collected and 24 hours urinary collection in the container from all the selected subjects were received in the next morning.

Results: Analysis of results revealed excretion of albumin to be 55.96 ±10.8 µg/min in group B (hypertensive), in comparison to 14.18 ±0.59 in control group. While in the subgroups of group B, we observed the mean values of urinary albumin excretion 48.93 ±11.72 in subgroup B-l (mild hypertensive), and 63.00 ±18.38 in subgroup B-2 (moderate hypertensive).

Conclusion: Our study concluded that increased levels of microalbuminuria are associated with the increasing intensity of hypertension. Early detection of risk factors and timely intervention may ensure a longer and healthier life.

Key words: Microalbuminuria, Hypertension, Mean Arterial Pressure.

INTRODUCTION

The association between microalbuminuria and hypertension was established long time ago.[1] In some guidelines, the measurement of microalbuminuria is recommended for risk stratification in people with hypertension.[2] Blood pressure and microalbuminuria are closely interlinked although the controversy persists as to whether microalbuminuria heralds the rise in blood pressure or increases in blood pressure leads to kidney damage hence paving way for microalbuminuria.[3] In hypertension and diabetes, microalbuminuria is an important indicator of vascular damage.[4] Microalbuminuria has been associated with an adverse atherogenic risk profile and a higher prevalence of cardiovascular disease.[5] Microalbuminuria and peripheral arterial disease may be markers of generalized atherosclerosis.[6] Microalbuminuria has been related to endothelial damage/dysfunction. Endothelial cells release both relaxing and contracting factors that modulate vascular smooth muscle tone and also participate in the pathophysiology of essential hypertension.[7] Urinary albumin excretion in some patients with essential hypertension is due to increased glomerular hydrostatic or increased permselectivity of the glomerular basement membrane.[8] Endothelial dysfunction could cause albuminuria both directly, by increasing glomerular pressure and glomerular basement membrane permeability, and indirectly, by influencing mesangial cell and podocyte function in a paracrine fashion (e.g. through inflammatory mechanisms).[9]

Proteinuria is usually an indicator of increased glomerular permeability to normally non-filtered plasma macromolecules such as albumin. In this condition the protein excretion usually exceeds 300-500mg/day. A 24-hour urine collection showing the presence of more than 150 mg of protein is abnormal. A urine dipstick test if constantly positive for protein is an important indicator of proteinuria.[10]

Microalbuminuria is a specific, integrated marker of cardiovascular risk and target organ damage in primary

hypertension and one that is suitable for identifying patients at higher global risk.[11] A considerable indication of cardiovascular and renal risks in both diabetic and non-diabetic cases is microalbuminuria. Evaluation of urinary albumin excretion is increasing in hypertensive patients which in turn is proving to be helpful in assessing the risk factors and planning out preventative strategies. Thus the key to a better understanding of the role of microalbuminuria assessment in hypertensive management is the knowledge of determinants of microalbuminuria.[12]

MATERIALS AND METHODS

This study was carried out in the Department of Physiology, Basic Medical Sciences Institute in collaboration with Medical Unit-III (Ward-7), Jinnah Postgraduate Medical Centre, Karachi. A total of 60 subjects, who consented to participate, were included in this study. The subjects below 55 years of age not suffering from severe hypertension and diabetes mellitus were recruited in the study. Those fulfilling inclusion criteria were invited for second visit to bring 24 hours urinary collection in container provided to them. Measurement of urinary volume, albumin concentration (by colorimetric test Pyrogallol-Red) and creatinine concentration were performed. The study participants were divided into the following groups:

Group A - Normotensive (N=30)

Group B - Hypertensive (N=30)

• B-l - Mild Hypertension (Systolic BP 140-159mmHg / Diastolic BP 90-99mmHg)

• B-2 - Moderate Hypertension (Systolic BP 160-179 mmHg / Diastolic BP 100-109 mmHg)

RESULTS

The mean ages of group A, B-1 and B-2 were 48, 53 and 51 years respectively.

The mean value of systolic blood pressure noted in control group was 120.66 ±1.82, while in group B-l it was 154 ±1.21, and 172.066 ±0.95 in group B-2. The mean value of diastolic blood pressure as noted was 79.16 ±1.92 in control group, 96 ±0.87 in group B-l, 108 ±0.65 in group B-2 (shown in table 1). In control group, excretion of albumin was noted to be 14.8 ±0.59 ug/min, while we found 48.93 ±11.72ug/min in group B-l, 63.00 ±18.38ug/min in group B-2 (shown in table 2).

DISCUSSION

This study was conducted on subjects having mild to moderate hypertension and compared with normal healthy subjects. Basic idea is the fact that hypertension has shown to be coincided with increased albuminuria. Our results have endorsed the fact that the increased severity of hypertension tend to increase degree of microalbuminuria.

Table-1: Comparison of systolic blood pressure, diastolic blood pressure and mean arterial pressure of control with Hypertensive subgroups on the basis of severity of Hypertension

Variables	Group A (Control) (n=30)	Group B-1 Mild Hypertension (n=15)	Group B-2 Moderate Hypertension (n=15)
Systolic Blood Pressure (mmHg)	120.66 ±1.82	154.00 ±1.21	172.66 ±0.95
Diastolic Blood Pressure (mmHg)	79.16 ±1.92	96.00 ±0.87	108.00 ±0.65
Mean Arterial Pressure (mmHg)	93.16 ±1.72	114.66 ±0.92	129.88 ±0.61

Table-2: Comparison of urinary albumin excretion rate of subgroups of hypertensive patients on the basis severity of hypertension with control group

Variables	Group A (Control) (n=30)	Group B-1 Mild Hypertension (n=15)	Group B-2 Moderate Hypertension (n=15)
Urinary Albumin (mg/l)	18.97 ±0.97	47.26 ±10.22	56.4 ±15.00
Urinary Albumin Excretion Rate (µg/min)	14.81 ±0.597	48.93 ±11.72	63.00 ±18.38

The association between microalbumin excretion and risk factors of Ischemic Heart Diseases has also been observed by other workers.[13] These results are in accordance with other studies regarding hypertensive subjects, who have exhibited increased levels of microalbuminuria.[14]

An other study[15] compared 24-hour urinary albumin excretion in a group of normotensive, borderline, and untreated mild hypertertensive and assessed the possible relation between microalbuminuria and arterial blood pressure. Higher values of microalbuminuria were observed in the mild hypertensive as compared to the other two groups. Present study is in agreement with these observations; as our data also suggested that the albumin excretion had significantly increased with increasing severity of hypertension. We found 48.93

±11.72µg/min in group B-1 (mild hypertension), 63.00 ±18.38µg/min in group B-2 (moderate hypertension) as compared to 14.81 ±0.59 µg/min in control group.

CONCLUSION

Our study concluded that increased levels of microalbuminuria are associated with the increasing intensity of hypertension. Early detection of risk factors and timely intervention may ensure a longer and healthier life.

REFERENCES

1. Bianchi S, Bigazzi R, Campese VM. Microalbuminuria in essential hypertension. J Nephrol 2001; 10(4):216-218.
2. Klausen KP, Scharling H, Jensen G, Jensen JK. New Definition of Microalbuminuria in Hypertensive Subjects. Hypertension 2005; 46:33-38.
3. Nannipiei M, Manganiello M, Pezzatini A. Polymorphisms in the Hanp (Human atrial natriuretic peptide) Gene, Albuminuria and hypertension. Hypertension 2001; 37:1416.
4. Lydakis C and Lip GYH. Microalbuminuria and cardiovascular risk. Q J Med 2004; 9:381–391.
5. Diercks GFH, Boven AG, Hillege JL, Jong PE. The importance of microalbuminuria as a cardiovascular risk. Canadian J Cardiol 2002; 18(5):525-535.
6. Jager A, Kostense PJ, Ruhe HG, Heine RJ, Nijpels G, Dekker JM. Microalbuminuria and Peripheral Arterial Disease Are Independent Predictors of Cardiovascular and All-Cause Mortality, Especially Among Hypertensive Subjects. Arteriosclerosis, Thrombosis, and Vascular Biology 2001; 19:617-624.
7. Varughese GI, Lip GYH. Hypertension in patients with type-II diabetes; relation to urinary albumin excretion, endothelial function and inflammation Human Hypertension. J Human Hypertension 2003; 11: 727-732.
8. Pontremoli R, Sofia A, Ravera M, Nicolella C, Viazzi F, Tirotta A, et al. Prevalence and Clinical Correlates of Microalbuminuria in Essential Hypertension. Hypertension 2007; 30:1135-1143.
9. Stehouwer CDA. Endothelial dysfunction in diabetic nephropathy: state of the art and potential significance for non-diabetic renal disease. Nephrol Dial Transplant 2004; 19:778-781.
10. Satyanyranana U. Biochemistry. Books and Allied Ltd India; 2000: p602.
11. Ravera M, Ratto E, Vettoretti S, Viazzi F, Leoncini G. Microalbuminuria and subclinical cerebro-vascular damage in essential hypertension. Hypertension 2002; 15(5):519-524.
12. Redon J, Rovira E, Miralles A, Julve R, Pascual JM. Factors related to the Occurrence of Microalbuminuria during Antihypertension Treatment in essential Hypertension. Hypertension 2002; 39:749.
13. Pedrinelli R, Omo GD, Bello VD, Pellegrini G, Pucci L and Penno G. Low-Grade Inflammation and Microalbuminuria in Hypertension. Arteriosclerosis, Thrombosis, and Vascular Biology 2004; 24:241-4.
14. Barzilay JI, Peterson D, Cushman M, Susan R, Jie J, Russell P et al. The relationship of cardiovascular risk factors to microalbuminuria in older adults with or without diabetes mellitus or hypertension. J Human Hypertension 2004; 44(1): 234-36.
15. Giaconi S, Levanti C, Fommei E, Innocenti F, Seghieri G, Palla L, et at. Microalbuminuria and casual and ambulatory blood pressure monitoring in normotensives and in patients with borderline and mild essential hypertension. Am J Hypertens 2003; 2(4):259-62.

Address for Corresponding Author:
Dr. Zulfiqar Ali Shaikh,
Head Community Medicine Department,
Dow International Medical College / DUHS, at Ojha Campus SUPARCO Road, Karachi.
E-mail: drzulfiqarshaikh@gmail.com
Contact: 0333-2356234

Original Article

Awareness Among Sanitary Workers Regarding Their Job: A Survey at Tertiary Care Hospital

1. Ishtiaq Ahmed 2. Umar Farooq 3. Mahwish Rabia 4. Asma Naheed
5. Abida Maryum 6. Asia Ali
1. Assoc. Prof. of Surgery 2. Asstt. Prof. of Surgery 3. Sen. Registrar, IIMC, Rawalpindi
4. Asstt. Radiologist, HFH, Rawalpindi 5. M.O. 6. M.O.

ABSTRACT

Objective: A cross sectional study to assess the level of awareness and knowledge of sanitary workers about infectious diseases, handling and disposal of hospital waste material.
Study Design: A cross sectional study.
Place and Duration of Study: A 600 bed tertiary care hospital of Rawalpindi district.
Methodology: All sanitary workers working in the hospital for more than three months were interviewed by a doctor in the language which they understand. An anonymous, self descriptive, comprehensive questionaire was designed containing all information's regarding experience, training of job and awareness regarding types and disposal of waste material etc.
Results: Among 88 workers interviewed, (47.72%,n=42) were males and (52.28%,n=46) were females. Among them (39.78%,n=35) were having more than 5 years of experience as a sanitary worker. Only 4.54% had some training before joining their job. None of them were having medical checkup or vaccination before or during job. Majority were not using heavy duty gloves (76.14%,n=67), Apron (72.73%,n=64), industrial long shoes (93.19%,n=82), and masks (87.50%,n=77). Thirty one (35.32%) workers were dumping waste material in open and (64.78%,n=57) workers were dumping in isolated open place specified for the purpose. Forty eight (54.55%) workers were not using antiseptic or detergents for cleaning bedpans. Regarding hand washing practice, only (7.95%,n=07) workers were using some antiseptic. Majority were totally ignorant about infectious diseases (72.73%,n=64), handling of waste (81.81%,n=72), disposal of patient secretions (86.37%,n=67), used dressings, blood samples/bags (90.78%,n=79), injection vials/syringes (86.37%,n=76) and disposable items (82.96%,n=73).
Conclusion: Handling of waste from the source to its final disposal should be done carefully under the supervision of trained staff. Training of the sanitry workers of the hospitals is required for this purpose. It will not only reduce the spread of infectious diseases, but also improve the health and efficency of the workers.

Key words: Sanitary workers, Waste disposal, Hospital wastes

INTRODUCTION

Hospital waste poses potential threat to the human health and the environment. With the increasing incidence of deadly diseases like AIDS, Hepatitis B and C, SARS, Avian Flu and ever deteriorating quality of drinking water due to environmental degradation by chemical pollutants, the proper disinfection and disposal of hospital waste is even more relevant today.[1,2] With the world becoming a global village, chances of spread of infections are on the increase and would cause widespread disturbances in a society. Improper management of hospital waste also has far reaching socio-economic impact.

The hospital waste may contain infectious agents, genotoxic material, chemical toxins, radioactive material and sharp objects. Major portion of this is contained in syringes, intravenous needles, blood, body fluids, human tissues, dressing, drainage bags and frequently use disposable items.[2,3] The quantity of solid waste generated by hospital is increasing day by day due to increase in use of disposable items, increase number of health care facilities and advancement in healthcare techniques.[4,5]

The management of waste from hospitals, other health facilities and health related research laboratories has gained increased attention in recent years. Waste management procedures even in many European facilities and most of the developing countries are unorganized because of poor coordination and cooperation between health authorities and environmental protection agencies. Lack of funds and untrained staff are the major causes. This poor management of the health care waste exposes health care workers, waste handlers and the community to severe infections, toxic effects and injuries. Effective

waste management can reduce health risk, save money and protect environment.[2,6]

In our country, it is unfortunate that standard measures for the safe disposal of hospital waste are not being followed or implemented in most of the hospitals in public sector, nursing homes and private clinics. Proper segregation of waste, use of incinerators for disposing dangerous waste is not being done in majority of hospitals. Majority of it being handled along with general municipal waste by ordinary methods and part of it being recycled and reused, exposing the common public to health risks.[6] The sanitary workers are one of the key persons in the chain of disposal of hospital waste, who had an important role in collection, segregation, disposal and dumping of waste. The aim of this study is to assess the level of awareness and knowledge of sanitary workers about infectious diseases, handling and disposal of hospital waste material.

MATERIALS AND METHODS

This cross sectional study was carried out over the full time sanitary workers from a 600 bed tertiary care hospital of Rawalpindi district. An anonymous, self descriptive, comprehensive questioner was designed containing all information regarding experience, training of job and awareness regarding disposal of waste material etc. Sanitary workers who had joined recently within three months as a first job or working as part-time were excluded from the study. All sanitary workers, working for more than three months, were interviewed by a doctor in their own language and were suppose to answer in yes/no or in the form of duration which was specified in questioner. Informed cosent from the sanitary workers for the study was taken. All the data analyzed by using software EPI 6 at the end of study.

RESULTS

A total of 88 workers were interviewed, among them (47.72%,n=42) were males and (52.28%,n=46) were females. Only (4.54%,n=04) had some training before joining this job, (47.72%,n=42) were having experience less than 5 years and (39.78%,n=35) were having more than 5 years of experience as a sanitary worker. Majority (69.31%,n=61) among them were working in wards. None of them were having any sort of medical checkup or vaccination against any infectious disease before or during the job. Only (15.90%,n=14) had given history of vaccination during childhood. Regarding use of protective measures during job, majority were not using heavy duty gloves(76.14%,n=67)), Apron (72.73%,n=64), industrial long shoes(93.19%,n=82)), or masks(87.50%,n=77). About dumping of waste, none had given any evidence of dumping in polythene bags/drums according to standard color coding. Whereas (35.32%,n=31) workers were routinely dumping in open and (64.78%,n=57) were dumping in an isolated open place specified for this purpose. All were using antiseptic/detergents in the wards for cleaning the floor. Whereas (54.55%,n=48) were not using antiseptic/detergents for cleaning bedpans and (18.19%,n=16) were not using it for cleaning washrooms. Regarding hand washing practice, (39.77%,n=35) were using simple water only, (52.27%,n=46) were using soap and only (7.95%,n=07) were using some antiseptic to clean their hands after work. Awareness about infectious diseases ,(72.73%,n=64) had no knowledge about it, (81.81%,n=72) were not aware about handling of waste, and (86.37%,n=76) were totally ignorant about hazards of improper handling of waste. Majority of workers (86.37%,n=76) were having no knowledge of disposal of patient secretions, empty injection vials and syringes, (90.78%,n=79) were unaware how to dispose off used dressings, blood samples and bags and (82.96%,n=73) were ignorant about disposal of disposable items.

Table-I: Demographic data of sanitary workers n = 88

		<20	21 to 30	31 to 40	41 to 50	> 50	Total	95% Confidence limits
Sex	Male	4	16	11	11	-	42 (47.72%)	50.22 to 43.08
	Female	-	22	16	8	-	46 (52.28%)	56.13 to 48.34
Experience	Nil	4	6	1	-	-	11 (12.50%)	14.56 to 10.23
	<5 yrs	-	22	12	8	-	42 (47.72%)	50.22 to 43.08
	>5 yrs	-	10	14	11	-	35 (39.78%)	42.95 to 36.58
Training of Job	Before joining	-	-	1	3	-	4 (4.54%)	3.46 to 5.25
	During job	-	-	-	-	-	-	
Place of job	Ward	4	22	19	16	-	61 (69.31%)	74.12 to 64.43
	OT	-	7	4	-	-	11 (12.50%)	14.56 to 10.23
	Other Hospital Area	-	8	5	3	-	16 (18.19%)	20.13 to 16.76

Table – II: Summary of response of sanitary workers to different questions
n = 88

Questions		YES	NO
Medical check up	At enrolment	--	88(100%)
	During job	--	88(100%)
Vaccination	In child hood	14(15.90 %)	74(84.10%)
	During job	--	--
Use of protective measures during work	Gloves	21(23.86%)	67 (76.14 %)
	Apron	24(27.27%)	64 (72.73 %)
	Long shoes	6(6.81%)	82(93.19%)
	Masks	11(12.50%)	77(87.50%)
Waste segregation before dumping		--	88(100%)
Dumping of waste	In open	57(64.77%)	31(35.32%)
	In polythene bags	--	88(100%)
	In isolated place	31(35.22%)	57(64.78%)
	Through drums	--	--
Use of detergent/ antiseptic	In cleaning floors	88(100 %)	--
	Bed pans/utensils	40(45.45%)	48(54.55%)
	Wash rooms/toilet	72(81.81%)	16(18.19%)
Washing hands after handling waste	With water	35(39.77%)	53(60.23%)
	With soap	46(52.27%)	42(47.73%)
	With antiseptic	7(7.95%)	81(92.05%)
Knowledge of awareness regarding	Infectious diseases	24(27.27%)	64(72.73%)
	Handling of waste	16(18.19%)	72(81.81%)
	Hazards of improper handling	12(13.63%)	76(86.37%)
Knowledge of disposal of	Patient secretions	12(13.63%)	76(86.37%)
	Used dressings	9(10.22%)	79(90.78%)
	Blood samples/bag	9(10.22%)	79(90.78%)
	Injections/syringes	12(13.63%)	76(86.37%)
	Disposable items	15(17.04%)	73(82.96%)

DISCUSSION

Hospitals protect and restore health and save lives but on the other hand they are major producer of potentially harmful waste and byproducts. Medical waste is divided usually into three groups i.e. infectious or "red bag", hazardous or "yellow bag" and general waste or "black bag". It is essential that risk waste (infectious and hazardous) is separated at the source from non-risk waste (general). Non-risk waste usually forms the greatest proportion of the total waste and can amount to as much as 80% of the total waste.[7] As this waste presents no greater risk than ordinary domestic garbage so it does not require some special or costly arrangements for its disposal. So it can be disposed through ordinary disposal route. Infectious waste is usually defined as consisting of pathological wastes, human blood and blood products, contaminated sharp instruments, anatomical wastes and wastes from isolation units.[8]

To differentiate between risk and non-risk waste, it is necessary that segregation must be done at the source i.e. in wards, bedside, operation theater, laboratory, and delivery room etc. This should be done by a trained person involved in the handling of waste disposal under the supervision of a nurse or a doctor in order to immediately secure the waste and to avoid dangerous secondary sorting. This segregation must remain intact from the point of production to the point of final disposal and all transportation and storage methods must also follow this segregation system.[9] Sanitary workers play an important role in keeping this chain of disposal intact and reliable. It is noticed in our study that none of the sanitary workers had an idea of types of waste and neither they were trained nor practice segregation of waste dumping. Separate bags/drums were not used and most of the sanitary workers dump the waste at open place in the hospital. Similarly another survey conducted by Rasheed and his colleagues in Karachi reveals that in only 25% of teaching hospitals, segregation and proper disposal of waste material is being practiced.[10]

Training programme of sanitary workers or persons involved in the handling of waste is important. Training should comprises of awareness regarding types of waste, segregation, storage, transportation , dumping, hazards of improper disposal of waste and knowledge about infectious diseases etc.[9,10] In our study, only 4.54% of sanitary workers had some formal training regarding their job in the past. Majority of the sanitary workers (93.46%) doesn't have any type of training regarding standard procedures of waste handling and disposal. Lack of training programme of sanitary workers at institutional levels is an area of major concern in our setup. Same observation was reported in the literature in which out of eight major teaching hospital in Karachi only one (12.5%) hospital arrange training sessions of waste handling staff.[10]

Basic personal hygiene of sanitary workers is also important for reducing the risks from handling biomedical waste. A program of immunization for all staff coming into contact with risk waste should be carried out. None of the persons in our study had any sort of medical checkup at the time of induction or during service at regular intervals. Only 15.90% of workers remember some vaccination in childhood but none of them gave any history of vaccination during job. Similarly same observation is also given in different studies from different hospital nationally and internationally.[7,8,10,11] In our study we observed that only 7.95% workers use antiseptic, 52.27% use some soap to wash their hands after handling of waste. Similarly Bedpans and other utensils used by patients were washed with antiseptics by 45.45%. Washrooms

and toilets were washed with antiseptic by 81.81% of cases. Almost same observations were also made in other studies conducted at other hospitals.[8,10,11]

Protective clothing like heavy duty gloves, sturdy/industrial shoes, aprons, leg protectors, eye protectors, mask, and gloves etc are not usually issued by the authorities.[12] In our study we observed that only 23.86% were using gloves (surgeon's gloves), 27.27% were using apron, 6.81% were using long shoes and only 12.50% were using masks during their duty. Proper heavy duty gloves, long industrial shoes/ leg protectors etc were not issued from the hospital authority. They were using gloves used in operation theater, and long shoes used only by those who were working in operation theater. Same observation was also reported by Chaudhary and his colleagues in their study.[13]

Hospital waste should not be dumped in open or used as landfill. Open dumping of hospital waste is hazardous, which is a major source of Polychlorinated Dibenz--Dioxins and Poly Chlorinated Dibenzofuranes in soil and water. These are potential carcinogens as reported in the literature. [14,15,16] Eighty percent of hospital waste is non-hazardous and does not require any special disposal procedure. About 20% of hospital waste contains hazardous material which require special disposal. There are three disposal options i.e. in house incineration, autoclaving and carting, and offsite incineration. Although autoclaving is the least expensive but incineration continues to be the option of choice. It is important to determine the kind of incineration system to use, its size and its configuration.[17,18] Unfortunately incinerators are not available in all hospital all over the country. In Rawalpindi/Islamabad city, among 14 major tertiary care hospitals, only three hospitals are having functional incinerators. In a study done at Karachi, it was reported that among eight major teaching hospitals, 62.5% were using incinerators, 25% dispose off as municipal landfill and 12.5% was burning the waste in open air without sufficient treatment.[10]

CONCLUSION

Handling of waste from the source to its final disposal should be done carefully under the supervision of trained staff. Training of the sanitry workers of the hospitals is required for this purpose. The key aim of an acceptable waste management system is to develop technical guidance for assessing the quantities and types of wastes produced in different facilities. It will not only reduce the spread of infectious diseases, but also improve the health and efficiency of the workers.

REFERENCES

1. Park H, Lee K, Kim M, Lee J, Seong SY, Ko G. Detection and hazard assessment of pathogenic microorganisms in medical wastes. J Environ Sci Health A Tox Hazard Subst Environ Eng. 2009;44(10):995-1003.
2. Abd El-Salam MM Hospital waste management in El-Beheira Governorate, Egypt. J Environ Manage. 2010;91(3):618-29.
3. Ather S. Hospital waste management (editorial). J Coll Phy Surg Pak 2004;14(11):545-6.
4. Karagiannidis A, Papageorgiou A, Perkoulidis G, Sanida G, Samaras P. A multi-criteria assessment of scenarios on thermal processing of infectious hospital wastes: a case study for Central Macedonia. Waste Manag. 2010;30(2):251-62.
5. Eker HH, Bilgili MS, Sekman E, Top S. Evaluation of the regulation changes in medical waste management in Turkey. Waste Manag Res. 2010;20(2):178-82.
6. Suess M J. Hospital waste management an international viewpoint. Environ Manag and Health. 1992; 3(1): 6-9.
7. Mochungong PI, Gulis G, Sodemann M. Hospital workers' awareness of health and environmental impacts of poor clinical waste disposal in the Northwest Region of Cameroon. Int J Occup Environ Health. 2010;16(1):53-9.
8. Mahmood, Shahab S, Malik R, Azim W. A study of waste generation, collection & disposal in a tertiary hospital in Pakistan. Pakistan J Med Res 2001;40(1):13-7.
9. Mehrdad A, vakili M, Kabir G. Hospital waste management status in university hospital of Fars province Iran. Int J of Environ Health Res. 2004;14(4):295-305.
10. Rasheed S, Iqbal S, Baig LA, Mufti K. Hospital waste management in the teaching hospitals of Karachi. J Pak Med Assoc 2005;55(5):192-5.
11. HabibUllah J, Ahmad K, Khan MA. Managing the healthcare solid waste in selected Districts of Punjab, Pakistan. Pak J Med Sci 2010;26(4): 795-799
12. Tiwari RR. Occupational health hazards in sewage and sanitary workers. Indian J Occup Environ Med. 2008 Dec;12(3):112-5.
13. Chaudhary MA, Hyat A, Qureshi SM, Najmi SAA. Health hazards of hospital waste to sanitary workers at Combined Military Hospital, Rawalpindi. Pak Armed Forces Med J 2004;54(2):253-8.

14. Ruoyan G, Lingzhong X, Huijuan L, Chengchao Z, Jiangjiang H, Yoshihisa S, et al. Investigation of health care waste management in Binzhou District, China. Waste Manag. 2010;30(2):246-50.
15. Almuneef M, Memish ZA. Effective waste management: it can be done. Am J Infect Control. 2003;31(3):188-92.
16. Nquyen HM, Tu BM, Watanabe M. open dumping site in asian developing countries: a potential source of Polychlorinated Dibenz-P-Dioxins and Poly chlorinated Dibenzofuranes. Environ Sci technol. 2003;37(8):1493-502.
17. Klangsin P, Harding A K. Medical waste treatment and disposal methods used by hospitals in Oregon, Washington and Idaho. J of Air and Waste Manag Assoc 1998; 48(6): 516-26
18. Rogers DE, Brent AC. Small scale medical waste incinerators: experiences and trials in South Africa. Waste Manag 2006;26(11):1229-36.

Address for Corresponding Author:
Umar Farooq,
House No.576, Street 40, Phase-II,
Bahria Town, Rawalpindi.
E-mail: umaribd@yahoo.com
Ph: 0345-9728888

Original Article

Fatal Compressive Trauma to Neck

1. Muhammad Maqsood 2. Muhammad Khalid Ch 3. Javed Iqbal Khokhar 4. M. Iqbal Mughal

1. Asstt. Prof. of Forensic Dept., KEMU, Lahore 2. Assoc. Prof. of Forensic Dept., FMHM&DC, Lahore
3. Assoc. Prof. of Forensic Dept. CMH, LMC, Lahore 4. Prof. of Forensic Dept., CPMC, Lahore

ABSTRACT

Objective: A study was conducted to investigate features of death due to strangulation in Lahore and to compare them with other studies on this subject.

Materials and methods: 220 cases of strangulation were selected out of 2979 total medico legal autopsies conducted at Forensic Medicine department K.E.M.U Lahore during Jan, 2006-Dec,2008.The selected cases were analyzed for different variables.

Results: Neck compression constituted 7.39% of total autopsies and 89.43% of total asphyxial deaths. Hanging accounted for 42.27% followed by ligature strangulation 29.09% and throttling 23.64%. All types of strangulation were prevalent in 2nd, 3rd & 4th decade of life. No case was noticed in age below 1 year. No hanging was noticed in 1st decade of life. Male had higher incidence over females in hanging in 3rd and 4th decade. Female had higher incidence in 2nd 3rd and 4th decade in ligature strangulation. Male had higher incidence in 3rd and female in 4th decade in throttling. Homicidal deaths accounted for 57.27%, suicidal 30.90%and undeterminable for 11.82%. Ligature strangulation and throttling were the methods used for homicide 57.27% while hanging was used for suicide 30.97%.

Above the thyroid cartilage, the marks were 58.63% with M/F ratio 1.86:1 giving. 53 (41.08%) fractures of the hyoid bone while marks at thyroid cartilage were 36.81% with M/F 1.79:1 giving (3) 3.70% hyoid bone fractures. Below thyroid cartilage 4.5% marks showed no hyoid bone fractures. Throttling showed hyoid bone fracture 69.23%, hanging 14.42%& ligature strangulation 7.81%. Ligature material used was soft in 47.62% cases and hard in 40.48%. It was used in single whirl in 57.41% cases and in multiple whirls in 42.86% cases. Ill defined marks were 40.45% and well defined were 64.09%.

In hanging knot was present on occiput in 62.50% cases and on lateral sides in 23.08% cases while 78.13%cases showed the knot on front and 21.87% cases on lateral side in ligature strangulation. Congestion was found in 85.45%, petechial hemorrhage in 81.81% and cyanosis in 75.54% cases.

Conclusion: Asphyxial death due to strangulation is common in our country in young age group in males. Hanging is a common method of suicide while ligature strangulation& throttling are used for homicide. The presence of compressive marks above thyroid cartilage are suggestive of death due to hanging and throttling while their presence at and below thyroid cartilage indicate ligature strangulation. This compressive trauma may or may not be associated with fracture of hyoid bone , which is a strong evidence of death due to strangulation.

Keywords: Hanging. Ligature strangulation, Throttling.

INTRODUCTION

Neck acts a conduit carrying blood, nervous impulses and air in both directions as well food to the stomach. Such a region is vulnerable to severe injuries. These injuries may include compressive trauma to neck. Compression of neck may occur in a number of ways, most commonly by ligature or manual application. In hanging compressive force is provided by the body weight of the victim. Complications of neck trauma like laryngeal edema, hemorrhage or surgical emphysema may also cause compression [1]. Pressure on neck may also arise from direct blows, arms locks, accidental fall onto neck, and entanglement with cords [2].

When pressure is applied on neck, the effects produced depend upon the structure or structures involved individually or collectively. However the precise events in any single case will depend upon the method used, the sites of pressure and the force with which it is applied.

Obstruction of jugular veins produces impaired return of blood from head to heart producing cyanosis, congestion and petechiae. Tension required is equal to 2 kg to occlude the veins. Obstruction of carotid arteries causes cerebral ischemia. It requires a tension of 3.5 kg for occlusion of arteries . Stimulation of baroreceptor nerve endings in the carotid sinus which lie in the internal carotid arteries just above the carotid bifurcation lead to parasympathetic and symptho-adrenline stimulation. The impulses are sent to the 10th nucleus in the brain stem through glossopharyngeal

nerve and then to heart via vagus nerve. Obstruction to the respiration is also produced by the elevation of larynx and tongue closing the air way at the pharyngeal level. It is difficult to occlude the airway at laryngeal or tracheal level due to the rigidity of the strong cartilage unless extreme pressure is applied. It requires 15 kg tension. Pressure on larynx may produce fracture of hyoid bone and thyroid cartilage ([2,3,4,5,6]).

Low O_2 level produces tissue anoxia leading to capillary damage in the form of capillary dilatation, increased permeability, stasis of blood. It produces cyanosis, congestion, petechial haemorhage, oedema and serious effusion. Reduced blood volume and reduced flow will initiate the viscious circle of tissue anoxia.The time required to produce congestion and petechial haemorhage in living victim is a matter of controversy but it is generally agreed that a minimum of 15 – 30 seconds is required.

Objective

The purpose of this study is to investigate some features of death due to strangulation in Lahore and to compare them with other studies on this subject.

MATERIALS AND METHODS

Source of data

- All the medico legal autopsies conducted in the Department of Forensic Medicine & Toxicology KEMU Lahore during Jan 2006- Dec 2008. Autopsy reports, police documents and hospital records were perused. The selected cases were analyzed in terms of age, gender, type of compression of neck, manner of death, level of application of force in relation to thyroid cartilage, number of whirls of ligature material, presence of non specific signs of asphyxia and fracture of hyoid bone.

Selection criteria

Inclusion criteria

- Cause of death is due to strangulation by compression of neck

Exclusion Criteria

- All deaths were excluded in which trauma on neck was present but the cause of death was other than strangulation.

RESULTS

Total 220 cases of death due to compression of neck were selected out of 2979 medico legal autopsies conducted in the Department of Forensic Medicine & Toxicology KEMU Lahore during the 3 years study period. These cases of strangulation constituted 7.39% of total autopsies and 89.43% of total asphyxial deaths conducted during the study period.

TYPES OF COMPRESSION OF NECK

There were 3 types of method of compression among the cases under study. The frequency of occurrence is shown in Table No.1.

Table No. 1: Frequency distribution of various types of neck compression

Types	No. of cases	%age
Hanging	104	47.27
Ligature strangulation	64	29.09
Throttling	52	23.64
Total	220	100.00

The ages of the cases in this group included children less than 1 year to adults above 60 years. The age group 21-30 accounted for 35.91% of cases followed by age group 31-40 years for 25.91% and age group 11-20 years for 17.27%. The age group 11-40 constituted 56.36% of all cases. No cases of strangulation were reported in the age group below 1 year. There were 144 males (65.45%) and 76 females (34.55%) cases. (Table No. 2)

Table No. 2: Age & sex distribution of victims of fatal neck compression (n=220)

Age in Years	Male	Female	Total	%age
<1	-	-	-	
1 – 10	2	3	5	2.27
11 – 20	23	15	38	17.27
21 – 30	59	20	79	35.91
31 – 40	36	21	57	25.91
41 – 50	9	6	15	6.82
51 – 60	10	7	17	7.73
>60	5	4	9	4.09
Total	144 (65.45%)	76 (34.55%)	220	100.00

Victims of hanging, ligature strangulation and throttling were noticed in 2nd 3rd & 4th decade of life in higher incidence. No case of fatal compression was seen in age below 1 year. No case of hanging was noticed in first decade of life.

There was higher incidence in males than females in the ratios, 2.25:1 for hanging, 2.05:1 for ligature strangulation and 1.26:1 for throttling.

In case of hanging males had highest incidence in 3rd decade and females in 2nd decade of life. In ligature strangulation males had highest incidence in 3rd decade and female in 4th decade. In throttling males had highest incidence in 3rd decade and females in 4th decade. (Table No. 3)

Table No. 3: Age & sex distribution of various types of fatal compression of neck (n=220)

Age (Years)	Total	Hanging (n = 104) M/F ratio 2.25:1		Ligature Strangulation (n = 64) M/F ratio 2.05:1		Throttling (n = 52) M/F ratio 1.26:1	
		M	F	M	F	M	F
<1	0	0	0	0	0	0	0
1 – 10	05	0	0	1	2	1	1
11 – 20	38	14	10	6	3	3	2
21 – 30	79	28	9	17	6	14	5
31 – 40	57	19	4	12	7	5	10
41 – 50	15	4	4	2	1	3	1
51 – 60	17	5	4	3	1	2	2
>60	9	2	1	2	1	1	2
Total	220	72	32	43	21	29	23

\Legally manner of death may be natural or un-natural. In our study un-natural deaths included homicide, suicide or undeterminable deaths in which exact cause of death could not be ascertained due to natural or acquired limitations. No case of accidental compression of neck was reported during this period of study.

The distribution according to manner of death showed that homicides deaths accounted for 126 (57.27%) , suicidal death 68 (30.90%) while 26 cases (11.82%) remained un-determined due to natural or acquired limitations.

Male to female ratio was 2.15:1 for homicidal death, 2.77:1 for suicidal and 1.6:1 for un-determinable deaths . (Table No. 4)

Table No. 4: Manner of death in fatal compression of neck (n=220)

Age (Years)	G Total	Homicide M/F ratio 2.15:1			Suicide M/F ratio 2.77:1			Undetermined M/F ratio 1.6:1		
		M	F	Total	M	F	Total	M	F	Total
<1	0	0	0	0	00	00	0	0	0	0
1 – 10	5	2	3	5	0	00	0	0	0	0
11 – 20	38	8	6	14	5	9	14	7	3	10
21 – 30	79	36	11	47	20	06	26	4	2	6
31 – 40	57	20	14	34	16	02	18	3	2	5
41 – 50	15	8	2	10	4	01	5	0	0	0
51 – 60	17	6	3	9	5	0	5	0	3	3
>60	9	6	01	7	0	0	00	2	0	2
Total	220	86	40	126 (57.27%)	50	18	68 (30.91%)	16	10	26 (11.82%)

The manner of death in 104 cases of hanging showed 68 (68.50%) cases of suicide with M/F ratio 2.78:1. Males showed highest incidence in 3rd decade and females in 2nd decade. Homicidal hangings accounted for 9.62% and highest incidence was noticed in 3rd decade for both sexes. Male had higher incidence than female in all decades with M/F ratio 1.5:1.

Un-determined hanging accounted for 26 (25.00%). Highest incidence was seen both for males and females in 2nd decade of life. 1st & 5th decade showed no case. Male to female ratio was 1.6:1. (Table No. 5)

Table No. 5: Manner of death in hanging (n=104)

Age (Years)	Total	Homicide 10cases (9.62%) M/F ratio 1.5:1		Suicide 68cases (65.38%) M/F ratio 2.78:1		Undetermined 26cases (25.00%) M/F ratio 1.6:1	
		M	F	M	F	M	F
<1	0	0	0	0	0	0	0
1 – 10	0	0	0	0	0	0	0
11 – 20	24	2	1	5	6	7	3
21 – 30	37	4	2	20	5	4	2
31 – 40	23	0	0	16	2	3	2
41 – 50	8	0	0	4	4	0	0
51 – 60	9	0	0	5	1	0	3
>60	3	0	1	0	0	2	0
Total	104	6	4	50	18	16	10

In hanging 104 cases (47.27%) with M/F ratio 2.25:1 produced 15 (14.42%) fractures of hyoid bone with M/F ratio 4:1. In ligature strangulation 64 (29.09%) cases with M/F ratio 2.04:1 showed 5 (7.81%) fractures of hyoid bone with M/F ratio 1.5:1. In throttling 52 (23.64%) cases with M/F ratio 1.26:1 showed 36 (69.23%) fractures of hyoid bones with M/F ratio 2.27:1. Overall 220 cases produced 56 (25.45) fractures of hyoid bone. (Table No. 6)

Table No. 6: Fracture of hyoid bone.

Cause of death	No. of cases			%age	Ratio M/F	Fracture of the Hyoid bone			%age of fractures	Ratio M/F
	M	F	Total			M	F	Total		
Hanging	72	32	104	47.27	2.25:1	12	3	15	14.42	4:1
Ligature strangulation	43	21	64	29.09	2.04:1	03	02	05	7.81	1.5:1
Throttling	29	23	52	23.64	1.26:1	25	11	36	69.23	2.27:1
Total	144	76	220	100	1.89:1	40	16	56	25.45	2.5:1

Above thyroid cartilage 129 marks (58.64%) of violence or compression were found on neck, showing 53 (41.08%) hyoid bone fractures. Males showed 84 (58.33) marks with 38 (45.23%) hyoid bone fracture and females showed 45 (59.21%) marks with 15 (33.33%) hyoid bone fracture.

At level of thyroid cartilage 81 marks 36.81% were present with 3 (3.70%) hyoid bone fractures. Males showed 52 (36.11%) marks with 2 (3.84%) hyoid bone fractures while females showed 29 (38.15 %) marks with 1(3.44) fractures.

Below thyroid cartilage 10 marks (4.54%) gave no fracture of hyoid bone. Males showed 8 (5.55%) and females showed 2 (2.63%) marks.

It indicated higher incidence 129 (58.64%) above thyroid cartilage, followed by 81 (36.81%) at level and lowest 10 (4.54%) below the thyroid cartilage. Male to female ratio for above thyroid was 1.86:1, for at level 1.79:1 and for below was 4:1. (Table No. 7)

Table No. 7: Level of compression of neck in relation to thyroid cartilage and resultant fracture of hyoid bone (n=220)

Level	Total Cases	%age	M	%age	F	%age	M/F Ratio	Total Fractures		M	%age	F	%age	M/F Ratio
Above	129	58.64	84	58.33%	45	59.21%	1.86:1	53	41.08%	38	45.23%	15	33.3%	2.53:1
At	81	36.82	52	36.11%	29	38.15%	1.79:1	3	3.70%	2	3.84%	1	3.44%	2:1
Below	10	4.54	8	5.55%	2	2.63%	4:1	-	-	-	-	-	-	-
Total	220	100.00	144	99.99	76	99.99		56	25.45%	40	27.27	16	21.05	

In hanging 44 cases (42.30%) soft material was used and in 60 (57.69%) cases, hard material was used. 56 (53.84%) whirls were single and 48 (46.15%) multiple whirls were used. 44 (42.30%) marks were ill defined and 60 (57.69%) were well defined. In ligature strangulation, in 36 (56.25%) cases the ligature material was soft and in 28 (43.75%) hard material was used. 40(62.5%) cases showed single whirls while 24 (37.50%) showed multiple whirls. 36

(56.25%) ligature marks were ill defined and 28 (43.75%) the marks were well defined. In throttling 9 (17.30%) marks were ill defined and 43 (82.69%) marks were well defined. (Table No.8)

Table No. 8: Marks of application of force in relation to nature of material, No. of whirls, appearance.

		Total cases	%age	Hanging (n = 104)		Ligature Strangulation (n=64)		Throttling (n = 52)
Material	Soft	80	47.62	44	42.31%	36	56.25%	-
	Hard	68	40.68	60	57.69%	28	43.75%	-
Whirl	Single	96	57.14	56	53.84%	40	62.50%	-
	Multiple	72	42.86	48	46.15%	24	37.50%	-
Appearance of marks	Ill-defined	89	40.45	44	42.30%	36	56.25%	9 17.30%
	Well-defined	141	64.09	60	57.69%	28	43.75%	43 82.69%

Knot was present on occiput in 62.50% cases on lateral 23.08% in hanging while 78.13% cases showed knot on front and 21.88% showed on lateral side (either right or left) in ligature strangulation.Table-9

Table No.9: Position of knot in cases of hanging and ligature strangulation

Knot position	Hanging	Front	-	
		Occiput	65	(62.50)
		Lateral right or left	24	(23.08)
	Ligature strangulation	Front	50	(78.13)
		Occiput	-	
		Lateral right or left	14	(21.87)

Non specific signs of Asphyxia like congestion was found in 188 (85.45%) cases, petechial hemorrhage in 180 (81.81%) cases and cyanosis in 175 (75.54%) cases.

DISCUSSION

Our study revealed that the incidence of death due to compression of neck was 7.39% of total autopsies conducted in Forensic Medicine department KEMU during the 03 years period. It constituted 89.43% of total asphyxial deaths. This figure is much higher than those reported by [8]1.6%, [10]1.75 [7] 1.88%,[9] 2.94% of all deaths & 24.53 % of all asphyxial deaths, [14]5% of all deaths & 82% of asphyxial deaths, [15]1.17%,[18]12.4% of asphyxial death & 5.65% of all deaths but lower than [12]15.7% in Edirne Turkey.

The incidence of hanging is highest 47.27% followed by ligature strangulation 29.09% and throttling 23.64%. These figures are comparable with [7](hanging 57%, strangulation 21% ,throttling 18%),[10](hanging 61.17%, ligature strangulation 21.19% and throttling 17.64%),[8](hanging/ligature strangulation 80.7%. throttling 19.3%), [13](hanging/ligature strangulation 85%, throttling 6%),[18]12.4 % for ligature strangulation, [9](ligature strangulation 19.23%, throttling 46.15%) ,[12](hanging 41.8% ligature strangulation 2.9% throttling 2.3%), [14](hanging 69%).

The peak incidence for hanging, ligature strangulation and throttling is in 21-30 years of age. It was consistent with [14](57% cases), [15](3rd decade), [14](29.55%), [12](41.9 years average), [17](37.36%),[18](ages ranging from 1.5 to 70 years & mean age is 37.22+/-19.28 years).[16] Bowen has indicated a peak incidence for hanging in 50-59 years of age.[17]Guarner & Hanzlick quoted 31 years of age for studies in U.S.A.

Male to female ratio 1.89:1 is comparable with [7](2:1) but contrary to figures given by [12](3.9:1), [15](3:2), [18](1:1) Male to female ratio for hanging was 2.25:1, for ligature strangulation 2.05:1 and for throttling 1.26:1 showing higher incidence in males for all three types of strangulations. In hanging, males showed higher incidence (69.23%) over females (30.76%) which are consistent with [12]83.9% male, [7]2.7:1(M -73.07%/F - 26.92%).It may be attributed to the increasing economic & social burden with rising frustration of unemployment. In ligature strangulation & throttling, [7]58.97 males & 41.02 females have been quoted while other authors [12]1:3 for ligature strangulation and 1:2 for throttling & [9] 30.77 male % & 69.23 % females gave higher incidence in female victims..

The distribution according to manner of death showed that homicidal deaths accounted for (57.27%) which is higher than [7]45.05% ,much higher than [12]9% but lower than[18] 85%. Suicidal death (30.90%) is lower than [7]45.45% & [12] 47% but higher than [18]15%while (11.82%) remained un-determined due to natural or acquired limitations which is higher than [7]5.49%. [12]Azmak quoted 44%accidental death while no such case was reported in our study.

In hanging suicidal incidence 65.38 % is lower than [7]86.53%. Homicidal incidence 9.62% is higher than [7](3.84%) . Incidence for undeterminable death 25% was again higher than [7](9.6%) . This incidence is lower than [16]Bowen 95% suicidal. No case of accidental hanging was reported during this study period but [16]Bowen has

mentioned 5% accidental cases which are due to autoerotic cases.

The ligature marks and finger, thumb, nail marks were characteristic of all cases of death by ligature strangulation and throttling respectively. The level of constricting force over neck above thyroid cartilage was 58.64%, at level 36.81% and below thyroid cartilage 4.54%. This was comparable with other authors. [9] (80% above thyroid and 20% below thyroid in strangulation cases while finger and nail marks above thyroid cartilage were 58.33% and at thyroid cartilage 33.33%), [7] (43/52(82.52%) ligature marks above ,22/52(42.30%)& at level 6/52 (11.53%)below thyroid cartilage), [14] (58% above), [9] (80% above ,20% below thyroid cartilage),[8] (above thyroid cartilage in hanging cases (72.7%) & below it in(53.8%) cases of ligature strangulation) , [10] (64.3 %above ,27.1% at & 8.6 % below thyroid cartilage). It indicated that the incidence of fracture of hyoid bone was related with level of constriction of neck. Above thyroid cartilage compression showed 53 (41.08%) and at level, showed 3 (3.70%) fracture of hyoid bone and is consistent with the findings of other authors.

Throttling showed 69.23%, hanging 14.42% and ligature strangulation only 7.81% fractures of hyoid bone. [9]Srivasta quoted 19.23 % fractures of hyoid bone (throttling 25%) and[10] Malik 21.2% (hanging 6.97%, ligature strangulation 30% throttling 60%) [14] Hussain, 22.7%, [8] Rehman 24.52%, [12]Azmak 76.7% (hanging 46.4%) [15]Varma 80%.[7]Bashir reported 21.97%

Ligature material was soft 47.62% and hard 40.48% .[13]Sharma reported 56% soft materiel like sari & chunni. Single whirl was used in 57.14% and multiple in 42.86% [14]Hussain quoted single loop 77.7% & multiple 22.3%. Appearance of mark was ill defined in 40.45% and well defined in 64.09%.

In hanging suspension point in 65 (62.50%) cases was on occiput. In 24 (23.08) was on lateral sides right or left. In ligature strangulation 50 (78.13) cases showed knot on front and 14 (21.88) cases on lateral side@@@ [12]Azmak quoted knot on chin in 85.7% cases and on occiput 66% cases in hanging.

Cyanosis, congestion and petechial hemorrhages are classical signs of asphyxial death and could be observed in fresh bodies. Our study revealed congestion in 85.45% cases, petechial hemorrhages in 81.81% & cyanosis 5.54% which are comparable with [9](congestion 73.08% , petechial hemorrhages 34.62%), [14] (cyanosis 15.20%, congestion 72.70% and petechial hemorrhages 78%),[14](congestion 74 cases,petechial hemorrhages 68 cases ,cyanosis 52 cases out of 91 cases).

It is evident from the study that the incidence of fatal compression of neck is common in our country especially hanging and this manner is the most common and favorite method used for suicide perhaps due to easy and cheap availability of the ligature. Suicide occurs mostly in young age due to emotional instability than western countries. Males showed higher incidence certainly due to socio economic reasons. The presence of ligature mark above the thyroid cartilage is strongly suggestive of hanging while at and below the thyroid cartilage indicates death due to ligature strangulation. Throttling is common method used to kill a person due to easy accessibility and grasping of neck of the victims. The entire compressive trauma may or may not be associated with fracture of hyoid bone which is a strong evidence of death due to strangulation.

Appropriate measure to rectify socio economic disputes, familial conflicts, sexually jealousy, matter of honor, and literacy status may be helpful to reduce the homicidal & suicidal burden in near future.

The importance of scene investigation and proper postmortem external and internal examination is obvious.

REFERENCES

1. Vanezuis P. The Pathology of Neck. 1st ed. Butterworth & Co; London, 1989. P.56-75.
2. Knight B. Forensic Pathology 2nd ed. Arnold; London, 1996. P.90.
3. Shepherd R. Simpson Forensic medicine. 12th ed. Arnold; London. 2003. P.97.
4. Gordon I, Shapiro HA. eds Forensic Medicine. A guide to principles. 2nd ed. Churchill Livingstone; London. 1984. P.102-118.
5. Parikh K.C. Parikh's Textbook of Medical Jurisprudence Forensic Medicine and Toxicology. 7th ed. CBS Publishers;India.2006. P.3,34-3.57.
6. Awan.RN. Principles and Practice of Forensic Medicine.1sted, M Ishtiaq Printers;2009.P.106-12.
7. Bashir MZ, Malik AR, Malik SA, Rana PA, Aziz K, Chaudhry MK. Pattern of Fatal Compression of the neck-A Five Year Study in Lahore. ANNALS 2000;6(4), P.396-98.
8. Rehman IU, Aziz KK, Kaheri GQ, Bashir Z, The Fracture of Hyoid Bone in Strangulation-A review. ANNALS 2000; 6(3),P. 222-23.
9. Srivastava AK, Gupta SMD, Tripathi CB. A Study of Fatal Strangulation Cases in Varanasi (India). The Am J of Forensic Medicine and Pathology. 1987;8 (3),P.220-24.
10. Malik SA, Aziz K ,Malik AR,Rana PA. Fracture of hyoid bone: An indicator of death in strangulation .Pakistan Postgraduate Journal 1999;10(4), P.112-115.
11. Luke JL. Strangulation as a method of homicide (in new York city 1965-66). Arch Pathol 1967; 83:P.65-66.
12. Azmak D , Asphyxial Deaths. A Retrospective Study and Review of the Literature. The Am J of

Forensic Medicine and Pathology 2006; Vol 27 (2):P.134-144.
13. Sharma BR,Harish D, Sharma A, Sharma S, Singh H. Injuries to neck structures in deaths due to constriction of neck, with a special reference to hanging. J Forensic Leg medicine 2008 July; 15 (5) P.298-305.Epub 2008 March 14.
14. Hussain SM,Mughal MI,Din SZ,Baluch NA,Bukhari SMZ,Malik S et al. An Autopsy Study of Asphyxial Deaths, Med Forum 2008; 19 (4) P. 27-30.
15. Verma SK,Lal S. Strangulation deaths during 1993 - 2002 in East Delhi (India). Leg Med Tokyo 2006; 8(1)P.1-4 Epub2005 Jul 28.
16. Bawon DA. Hanging – A review. Forensic Sci international1982; 20 P.247-49.
17. Guarner J,Hanzlick R.Suicide by Hanging. The Am J of Forensic Medicine and Pathology 1987; 8(1)P.23-26.
18. Demirci S, Dogan KH, Erkol Z, Gunaydin G. Ligature strangulation deaths in province of Konya (Turkey). J Forensic Leg Med 2009; 16 (5) P.248-52.EPUB 2009 Jan 14.

Address for Corresponding Author:
Muhammad Maqsood,
Assistant Professor,
Forensic Medicine & Toxicology Department,
King Edward Medical University, Lahore.

Original Article

Atherosclerotic Lesions in Hypertensive Subjects - A Human Autosy Study

1. Amjad Naeem 2. Azhar Masud Bhatti 3. Syed Mudassar Hussain

1. Prof of Pathology, Akhtar Saeed M&DC, Lahore 2. A. Director Health Services, EPI, Punjab, Lahore
3. Asstt. Prof. Forensic Medicine, KEMU, Lahore

ABSTRACT

Objective: To assess the incidence and severity of atherosclerotic lesions in hypertensive subjects in our population.
Study design: Prospective descriptive observational study.
Place and duration of study: Mortuary of Forensic Department, King Edward Medical University Lahore and Pathology Department of Allama Iqbal Medical College Lahore. This study was completed in one and a half year.
Subjects and Methods: A total of 130 human autopsies were carried out in the mortuary of King Edward Medical University Lahore. Heart, aorta and its major branches were collected. History was taken from the close relative of deceased for hypertension. One to four areas of tissue were taken for each artery and aorta for histological examination. The section were stained with Haemotoxylin and Eosin stain. Different special stains were also performed on all cases to differentiate different components of atherosclerotic lesions.
Results: The fibrolipid plaques, complicated lesions and calcified lesions were present in a predominant number of cases in aorta and its major branches, except the fibrolipid plaques were less dominant in the right coronary artery, the complicated lesions were seen less frequently in the right coronary artery and the left renal artery and the calcified lesions were observed less dominantly in the thoracic aorta, anterior descending branch and circumflex branch of left coronary, innominate artery, coelic artery, superior mesenteric artery, inferior mesenteric artery and renal arteries. The calcified lesions were absent in the right coronary artery.
Conclusion: This study although preliminary but basic and observational in nature indicates the considerable severity of raised atherosclerotic lesions in hypertensive subjects in our population

Key wards: Atherosclerosis, lesions, hypertensive, arteries

INTRODUCTION

Hypertension is an important accelerator of the atherosclerotic process and it frequently accompanies adult coronary heart disease (1). The risk of coronary heart disease is strongly related to the levels of blood pressure. This is true for both males and females of all ages (2) (3,4) observed a remarkably significant difference between the severity of lesions of atherosclerosis in hypertensive and non-hypertensive. The South Asian countries contribute the highest proportion of the burden of cardiovascular disease compared with any other region globally(5).

MATERIALS AND METHODS:

A total of one hundred and thirty (130) human autopsies were carried out, in which ninety (90) were males and forty (40) were females in the study. The age range was between 8 and 85 years. The autopsies were done in the Mortuary of Forensic Department, King Edward Medical University, Lahore.

Selection of Dead Bodies.

All the dead bodies included in this study were examined in the interval which ranged from 4-10 hours between the death and autopsy. The dead bodies of men, women and children were included at random i.e on the basis of availability. In each case the relevant history was obtained from the closest relatives of the deceased. Autopsies were performed. The heart, aorta and its major branches were included in this study.

Performa for relevant history and autopsy findings.

1. Name
2. Date of birth (Exact/Application)
3. Date of death
4. Sex
5. Place of Residence
6. Occupation.
7. Any Medical Care before death.
8. Mode of death, Accidental death, non-accidental death
9. Was any diagnosis made before death, if yes, clinical diagnosis.
10. History of hypertension.

Heart, aorta and its major branches were collected.

Grading of Atheroma

Gross sections of coronary arteries were graded by one of the four scores according to the degree of atheromatous narrowing, Grade-I, upto 25% narrowing, Grade-II, 26-50% narrowing, Grade-III, 51-75% narrowing and Grade-IV greater than 75% narrowing. Complete occlusion with haemorrhage, ulceration, thrombosis and calcification were recorded separately. In addition, major degree of narrowing in each branch was noted; isolated areas of narrowing were specified as "Focal" and distance from origin of artery was noted. In all the 130 autopsies aorta, coronary arteries and renal arteries were examined. In thirty cases besides these three types of arteries the other major branches of aorta were also included in this study. 1-4 sections were taken from aorta for histological examination from the following sites.

1. Arch of aorta.
2. Above the celiac artery level (thoracic).
3. At renal arteries level (abdominal)
4. Below renal arteries level (abdominal).

In addition, 1-4 section from each of the coronary arteries and renal arteries were taken, 1-4 sections from each of the following arteries in thirty cases were taken i.e. innominate, common carotid, subclavian, coeliac,, superior mesenteric, inferior mesenteric and common iliac.

For histological examination tissue processing was done. On the average 7-8 slides were prepared from each block by taking ribbons of tissue. The paraffin section were stained using Haematoxylin and Eosin stain, von kossa's staining technique, periodic acid Schiff (PAS) reaction, Toludine blue stain and Peral's Prussian blue stain.

RESULT

In a total of 130 cases in whom aorta, coronary arteries and renal arteries were collected, 11 showed the history of hypertension. Amongst 30 cases in whom other arteries were also collected 3 cases showed the history of hypertension. The fatty streaks were not present in a predominant number of cases in aorta and its major branches in hypertensive. The fibrolipid plaques, complicated lesions and calcified lesions were present in a predominant number of cases in aorta and its major branches, except the fibrolipid plaques were less dominant in the right coronary artery, the complicated lesions were seen less frequently in the right coronary artery and the left renal artery and the calcified lesions were observed less dominantly in the thoracic aorta, anterior descending branch and circumflex branch of left coronary, innominate artery, coeliac artery, superior mesenteric artery, inferior mesenteric artery and renal arteries. The calcified lesions were absent in the right coronary artery. (Table No.1).

Table No.1: Number and percentage Distribution of atherosclerotic lesions in aorta and its major branches in relation to the H/O Hypertension

Blood Vessels	Fatty Streaks		Fibrolipid Plaques		Complicated lesions		Calcified Lesions	
	No	%	No	%	No	%	No	%
Thoracic aorta	3	27.3	7	63.6	6	45.5	3	27.3
Abdominal aorta	3	27.3	11	100.0	10	91.0	10	91.0
Anterior descending Lt. coronary artery	1	9.1	11	100.0	7	63.6	3	18.2
Circumflex Lt. coronary artery	1	18.2	11	100.0	5	45.5	1	9.1
Rt. coronary artery	1	9.1	3	27.3	1	9.1	-	-
Innominate artery	1	33.3	2	66.7	2	66.7	1	33.3
Rt. Common carotid artery	-	-	3	100.0	3	100.0	2	66.7
Lt. Common carotid artery	-	-	3	100.0	3	100.0	2	66.7
Rt. Subclavian Artery	1	33.3	3	100.0	3	100.0	2	66.7
Lt. Subclavian Artery	1	33.3	3	100.0	3	100.0	2	66.7
Coeliac Artery	1	33.3	2	66.7	2	66.7	1	33.3
Sup. Mesenteric Artery	1	33.3	2	66.7	2	66.7	1	33.3
Inf. Mesenteric Artery	1	33.3	2	66.7	2	66.7	1	33.3
Rt. Renal Artery	3	27.3	6	54.5	5	45.5	3	27.3
Lt. Renal Artery	3	27.3	6	54.5	3	27.3	2	18.2
Rt. Common iliac Artery	1	33.3	3	100.0	3	100.0	3	100.0
Lt. common iliac Artery	1	33.3	3	100.0	3	100.0	3	100.0
Mean incidence in all vessels		**24.4%**		**80.2%**		**70.3%**		**46.5%**

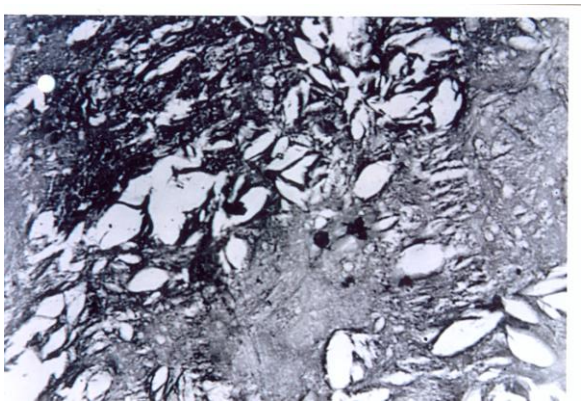


Fig. # 1 Photomicrograph of Atherosclerotic lesions in aorta in hypertensive subject showing cholesterol crystal clefts and free lipid pool. Haematoxylin and Eosin stain X 200mgf.

DISCUSSION

In this study the fatty streaks were not considerably seen in aorta and its major branches in hypertensive, whereas the fibrolipid plaques, complicated and calcified lesions were present in a predominant number of cases. However, the fibrolipid plaques were less dominant in the right coronary artery, the complicated lesions were seen less frequently in the right coronary and left renal artery and the calcified lesions were observed less dominantly in the thoracic aorta, anterior descending and circumflex branch of left coronary, innominate artery, coeliac artery, superior mesenteric artery, inferior mesenteric artery and renal arteries. The calcified lesions were absent in the right coronary artery. In an epidemiological study also found that there is acceleration of the development of all types of atherosclerotic lesions except fatty streaks in hypertensive (6). Hypertension was strongly related to the coronary heart disease (7) and an independent association has been found between aortic and coronary atherosclerosis and this disease (8) (9,10)established that in hypertension the excess shearing stress causes deformation of endothelial cells and ultimately erosion of the sub-endothelial tissue that enhances platelet adhesion and aggregation leading to atherosclerotic process. (11, 12) indicated that many anti-hypertensive drugs are positively correlated with blood lipid levels particularly low-density lipoprotein- cholesterol and very low-density lipoprotein cholesterol. These drugs may also reduce the average work load of the heart, but they may not protect against occasional bursts of pressure. It is just such pressure variability and raised lipid levels that may increase the risk of coronary heart disease. The earlier age of AMI in South Asians can be largely explained by higher risk factor levels at younger age(13)

REFERENCES

1. Lauer RM, Clark WR, Rames LK, Blood pressure and its significance in childhood. Postgraduate 1978;54,206.
2. Marmot MG. Epidemiological basis for the prevention of coronary heart disease. Bull . WHO 1979:57,331.
3. Woolf N. Atherosclerosis. In: Pomerance A, Danic MA, editors. The Pathology of the heart. Oxford-Black well Scientific publications; 1975.
4. Bolts ML, Hoes AW, Koudstaal PJ, et al. Common caotid intima-media thickness and risk of stroke and myocardial infarction: the Rotterdam study, Circulation 1997; 96:1432-7.
5. Reddy KS, Yusuf S. Emerging epidemic of Cardiovascular disease in developing countries. Circulation, 1998; 97:596-601.
6. Matova EE, Vihert AM, Atherosclerosis and hypertension. Bull. WHO 1976: 53, 539.
7. Wilson PW, Hoeg JM, Agostino RB, et al. Cumulative effects of high cholesterol levels, high blood pressure, and cigarette smoking on carotid stenosis. N Engl J Med 1997; 337:516-22.
8. Rhoads GG, Blackwelder WC, Stemmerman GN, Hayashi T, Kagen A. Coronary risk factors and autopsy findings in Japanese – American men. Lan. Invest 1978; 38: 304.
9. Greshman GA. Atherosclerosis: its causes and protential reversibility. Triangle 1976; 15:40.
10. Reddy KS. Cardiovascular diseases in non-Western countries. N. Engl J Med 2004; 350:2438-2440.
11. Korock M. Do Anti-hypertensive drugs increase coronary risk? JAMA 1981; 246:2008.
12. Ismail J, Jafar TH, Jafary FH, et al. Risk factors for non fatal myocardial infarction in young south Asian adults. Heart 2004; 90:259-263.
13. Joshi P, Islam S, Pais P et al. Risk factors for early myocardial infarction is South Asians compared with individuals in other countries. JAMA 2007; 297:286-94.

Address for Corresponding Author:
Amjad Naeem,
Professor of Pathology,
Akhtar Saeed M&DC, Lahore.