

Correlation between Obesity and Severity of Cholecystitis

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ABSTRACT

Objective: The aim and objective of this study is to assess the relationship between obesity and severity of Cholecystitis.

Study Design: Observational / descriptive study.

Place and Duration of Study: This study was conducted in the Punjab Employees Social Security Hospital Rawalpindi & Azmat Rasheed Hospital Rawalpindi from 1st January 2015 to 31st Dec 2015.

Materials and Methods: 84 patients of symptomatic gall stone disease were included in the study. BMI was calculated & recorded at the time of admission. Patients having $BMI > 25\text{kg}/\text{m}^2$ were put in category of overweight/Obese & those having $BMI < 25\text{kg}/\text{m}^2$ were considered to be of normal weight.

Results: In males proportion of complicated acute cholecystitis was significantly higher in non-obese patients and was around (21%) as compared to obese (7%) with significant statistical difference. On the other hand no significant statistical difference was found between female non-obese & obese patients.

Conclusion: Contrary to common belief, complication rate in obese males is less as compared to males of normal weight. While in females, no such difference is noted in complication rate of gall stone disease between obese and non-obese females.

Key Words: Obesity, gall stones, cholecystitis.

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INTRODUCTION

Whether or not obesity should be considered a disease on its own it is an important risk factor for many chronic physical and mental illness. These include cardiovascular diseases like angina, myocardial infarction¹, congestive cardiac failure², high blood pressure, abnormal cholesterol levels³, deep vein thrombosis, pulmonary embolism⁴, dermatological problems like acanthosis nigricans, lymphedema, cellulitis, hirsutism, and intertrigo⁵, endocrine problems like diabetes, polycystic ovaries⁶, complications of pregnancy, birth defects⁷, gastro-esophageal reflex disease, cholelithiasis⁸, neurological problems like stroke, migraine, dementia, carpal tunnel syndrome & meralgia paresthetica⁹, malignancies like breast, ovaries, colorectal, gall bladder, liver, pancreas, stomach, endometrial, cervical, prostate, kidney & non-Hodgkin's lymphoma¹⁰, psychiatric illnesses like depression, social stigma like 20% decrease chances of marriage in obese females¹¹, chronic lung disease and complications during general anaesthesia¹², sleep apnea syndrome, rheumatology like back pain, osteoarthritis and gout, sexual dysfunctions like erectile dysfunction, hypogonadism, Urological like urinary incontinence and chronic renal failure¹³.

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The prevalence of overweight and obesity were highest in the WHO regions of the North America (62% for overweight in both sexes, and 26% for obesity) and lowest in the WHO Region for South East Asia (14% overweight in both sexes and 3% for obesity). Obesity is more common a problem in females as compared to males.

Gallbladder disease (GBD) one of the commonest surgical disorder and is major cause of morbidity, hospital admission, surgical intervention and economic burden and is caused by gallstones¹⁴. Its prevalence however, varies amongst different populations. In American adults, the prevalence of cholelithiasis is about 10% while in Western Europe the prevalence ranges from 5.9% to 21.9%¹⁵. Prevalence rates of 3.2% to 15.6% have been reported from Asia¹⁶. Over 70% of patients with gallstones are asymptomatic¹⁷. The risk of developing symptoms or complications related to gallstones varies and is approximately 1–4% per year. The most common complications of gallstone disease are acute cholecystitis, gallstone pancreatitis and obstructive jaundice^{18,19}. Obesity is one of established risk factors in Gall-stone disease²⁰. Five Fs related to gall stone disease are fat, fertile, flatulant, female of forty. Relationship of body weight to gallstone disease has been studied thoroughly but there are very few studies showing the effect of body weight on intensity of cholecystitis. We have conducted a study to see the relationship between Obesity and severity of Cholecystitis.

MATERIALS AND METHODS

This is a prospective study carried out on 84 patients of cholecystitis whose weight and height measurements

had been recorded & BMI calculated at the time of admission. Patients having BMI $> 25\text{kg}/\text{m}^2$ were put in category of overweight/Obese & those having BMI $< 25\text{kg}/\text{m}^2$ were considered to be of normal weight. Patients identified with symptomatic Gall-stone disease were enrolled in study and were classified as -(a) chronic cholecystitis (b) uncomplicated acute cholecystitis (c) complicated acute cholecystitis. Acute cholecystitis was defined when the patient had 2 or more of the following clinical and operative findings- fever $>37.5^\circ\text{C}$, right upper abdominal pain with tenderness,(positive Murphys Sign) continuous symptoms > 48 hours despite medical treatment. Ultrasound feature showing wall thickness greater than 4mm and Operative findings included -adhesions to adjacent organs, gross inflammation of gall bladder serosa. Complicated acute cholecystitis refers to the development of life threatening complications such as empyema, peri-cholecystic abscess, gangrene and perforation. The patients with chronic cholecystitis were electively operated on, and those patients with acute cholecystitis were either operated on during their initial admission when they were stabilised or at a later date by performing interval cholecystectomy. The severity of inflammation for cholecystitis was prospectively graded as chronic, acute or complicated according to operative findings.

Data was analysed using SPSS 17 and compared using the Chi-Square test and a p value of < 0.05 was considered statistically significant.

RESULTS

Total number of patients in our study was 84. Out of the 84 patients 52(62.91%) were females & 32(38.09%) were males. Generally, gall stone disease is considered to be female dominant disease.

Table No.1: Percentage of male to female ratio.

Total	84
Male	32 (38.09%)
Female	52 (62.91%)

Gall stone disease is considered to be a disease of overweight and fatty females of middle age. People of BMI less than 18.5 are under weight, 18.5 to 25 are of normal weight and having BMI above 25 are overweight. Only people with BMI 30 and above are labeled as obese. 54(64.28%) patients were Obese/overweight. 30(35.71%) patients were Non-obese and having BMI calculated less than 25.

Table No.2: Percentage of overweight patients.

Total	84
Obese	54 (64.28%)
Normal	30 (35.71%)

58 cases (69.04%) were diagnosed to have chronic cholecystitis and 26 as acute cholecystitis. Out of 26 cases of acute cholecystitis, complications were seen in 7 patients (10%). Among the complicated cases, empyema was noted in 4 patients and peri-cholecystic abscess in 2 patients and one with mucocele.

Table No.3: Presentation of patients.

Total	84
Chronic cholecystitis	58 (69.04%)
Acute cholecystitis	19 (20.06%)
Acute cholecystitis with complications	7 (10%)

Surprisingly, in males, proportion of complicated acute cholecystitis was significantly higher in non-obese patients (21%) as compared to obese (7%) with significant statistical difference. According to our study, complicated acute cholecystitis seen in a much lower percentage in males. It seems to be that obesity in males act as some sort of barrier to cause complications. On the other hand there was no significant statistical difference between female non-obese & obese patients. The rate of complicated acute cholecystitis is almost equal in obese and non-obese females.

DISCUSSION

Obesity is on rise like an epidemic in developed world. Its prevalence is increasing in developing countries due to westernisation of lifestyle and change in dietary habits. The common perception in this part of the world is that obesity is characteristic of the developed countries. Recent research has revealed an alarming rise in the incidence of obesity globally including Asia and Africa. 2001 WHO report reveals obesity has reached almost epidemic proportions globally, with more than 1 billion adults overweight and at least 300 million of them clinically obese and is considered to be bigger health problem than smoking. It has become a major contributor to the health system globally. In developing countries, it coexists with under-nutrition, obesity is considered as a complex condition, with serious social and psychological dimensions, effecting virtually all ages, sex and socioeconomic groups. Increase in weight of a person is the result of several interrelated factors; these include environmental, genetic, and behavioral factors. Modern life has significantly affected daily life, by making both living and working conditions more relaxed. People tend to spend more hours sitting in front of televisions or computers as compare to outside, burning fewer calories, instead of engaging in healthy physical activity²¹. Common belief of many common people as well as health professionals that obesity is simply the result of a lack of will power and an inability to change eating habits is no longer defensible. Obesity and over weight is a result of more complex interaction of environmental and genetic factors. Now days,

popular current hypothesis is that in most people, obesity is the interaction of the environment and a genetic predisposition to accumulate excess adipose tissue. Usually, both the environmental factors and genetic factor must be present for obesity to occur. Recent evidence shows that animals infected with certain viruses develop obesity. This also challenged the hypothesis that obesity is almost always a product of a genetic predisposition. One or more of these viruses may contribute to obesity in humans, but additional research must be done²².

Body Mass Index (BMI) is a simple criterion of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as the weight in kilograms divided by the square of the height in metres (kg/m^2). There are different criteria to determine weight abnormalities and obesity using BMI as tool. According to WHO classification BMI from 18.5 to 24.9 is considered normal, from 25 to 29.9 is considered over-weight, from 30 to 34.9 is class 1 obesity, from 35 to 39.9 is class 2 obesity and 40 and above are considered as class 3. 66.7 percent of American population are considered overweight or obese, 34.3 percent were considered obese, and 5.7 percent were considered to have extreme obesity. Excess weight, especially obesity affects almost every aspect of health, from mood, memory, reproductive to respiratory system. Obesity increases the risk of several debilitating and deadly diseases like cardiac disease, diabetes and some malignancies. It does this through a variety of mechanisms; some as straightforward as the mechanical stress of carrying extra weight and some involving complex hormonal and metabolic changes. Obesity has a negative effect on the length and quality of life. Weight loss can reduce some obesity-related risks. Losing as little as 5 to 10 percent of body weight offers meaningful health benefits to people who are obese, even if they never achieve their "ideal" weight²³. Obesity is one of the risk factors of Gall-stone disease. The most common, and the only type associated with obesity, is the cholesterol gall-stone which consists mainly of accretions of cholesterol crystals around a nucleus. The other gallstone type, the pigment stone, is less frequently seen, contains larger amounts of calcium, and is usually associated with chronic haemolytic states and bacterial infections rather than with obesity.²⁴ Although obesity is an established risk factor for cholesterol gallstones in both genders, the association of gallstone disease with obesity tends to be found less consistently in men than in women²⁵. Similarly, in our study, more than 62 percent patients were females. Obesity is a significant risk factor for gallbladder disease, particularly in women. In an early study, the mean gallstone prevalence in moderately obese Caucasian American women was 31 percent compared with 10 percent in the normal weight control group²⁶. Several studies that

found a positive relation between body mass index (BMI; in kg/m^2) and gallstone disease in women failed to show such an association in men²⁷ which raises the possibility that men may be less liable to gallstone formation associated with obesity because they may have more lean body mass than women²⁸. The supersaturated bile in the gall bladder of obese subjects may account for this phenomenon²⁹. Obesity increases the biliary secretion of the cholesterol, by increasing in the HMG CoA reductase activity³⁰. In our study 54(64.28%) patients were Obese/overweight 30(35.71%) were Non-obese. Although there is increased incidence of Gall-stones in obese people but there is no such correlation between severities of cholecystitis with obesity. This was the outcome of our study as well. There was increased incidence of complicated Gall stone disease in non-obese male patients as compared to obese males, although this difference was insignificant in females. A possible explanation is that the body fat may have a protective effect on the inflammatory process of cholecystitis.

CONCLUSION

Gall stone disease is associated with obesity. Contrary to common belief, complication rate in obese males is less as compare to males of normal weight. While in females, no such difference is noted in complication rate of gall stone disease between obese and non-obese females.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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