Original Article

Haematological Profile and Seroprevalence of Hepatitis B & C in Patients Referred For Bone Marrow Examination

Effect of Seroprevalence of Hep.B & C in patients with bone marrow

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ABSTRACT

Objective: To find out the seroprevalence of hepatitis B and C in patients referred for bone marrow and to study the hematological profile of these patients.

Study Design: Descriptive / cross sectional study.

Place and Duration of Study: This study was conducted at the Department of Pathology, Ayub Medical College Abbottabad from January 2017 to December 2018**.**

Materials and Methods: 1000 consecutive patients recruited by non-random convenience sampling, initially screened by Immunochromatographic Technique (ICT), after history and examination. Patients positive for HBV or HCV, were tested further by Enzyme Linked Immunosorbant Assay (ELISA) for confirmation. ICT positive but ELISA negative patients were advised PCR for confirmation. The confirmed HBV or HCV positive patients were considered for seroprevalence of HBV and HCV. Complete blood counts were done on haematology analyzer, giemsa stained blood film used for microscopic examination of blood & bone marrow. Marrow iron was estimated by pearl stained slides. Data analyzed by SPSS 18.

Results: Expressed in tables (1-5), 35 were positive for HBV or HCV, comprising 14 male and 16 females with equal prevalence of HBV in males and females, while hepatitis C more prevalent in females with male: female of 0.78:1, 33.33% patients with hepatitis B and 40% with hepatitis C were >20 years. Anaemia was the commonest (40%) haematological abnormality, followed by thrombocytopenia (23.34%), leucopenia (13.33%), pancytopenia(13.33%) and bicytopenia (10%) respectively. Bone marrow examination revealed increased number of megakaryocytes in 10.8%, lymphocytes in7.7 % and absent marrow iron in 15.7% patients.

Conclusion: As much as 3% patients having HBV or HCV had haematological abnormality.

Key Words: Hepatitis B, Hepatitis C, Chronic Liver Disease, Hepatocellular carcinoma,

Citation of articles: Farid J, Idris M, Gul N. Haematological Profile and Seroprevalence of Hepatitis B & C in Patients Referred For Bone Marrow Examination. Med Forum 2019;30(4):107-110.

INTRODUCTION

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are DNA and RNA viruses respectively, causing liver infection[1, 2].They are transmitted mainly by parenteral route, though transmission does occur through sexual and vertical mode also. Prevalence of these infections varies from country to country. According to an estimate nearly 240 million people have hepatitis B and 108 million hepatitis C infection [3,4]. Hepatitis B and C are considered the leading causes of chronic liver disease and its complications [5]. (In Pakistan, some of the recent studies have shown that hepatitis C is more prevalent than hepatitis in our country)[6-8].

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Received: January, 2019
Accepted: March, 2019
Printed: April, 2019

The treatment of these infections, although available, is expensive and not effective in all case. Prevention is the only inexpensive strategy to control the infection to reduce the mortality, morbidity and economic problems associated with them. Studies conducted in Pakistan and many other countries on patients undergoing invasive procedures have revealed variable prevalence of HBV and HCV infection. A thorough literature research did not reveal any notable study conducted on patients undergoing bone marrow aspiration. The presence study was planed with a view to see the status of hepatitis B and C in patients undergoing bone marrow aspiration, a useful diagnostic procedure for haematological and non- haematological diseases.

MATERIALS AND METHODS

Patients were enrolled in the study by non random convenience sampling technique, after taking an informed written consent. The study was approved by the institutional ethical review committee. All the consecutive patients referred to the department of pathology Ayub Medical College between January 2017 and December 2018 was included in the study. For HBV and HCV, the initial screening was done by

Immunochromatographic Technique (ICT), after history and physical examination. Those patients, who were found HBV or HCV positive by this method, were advised further testing by Enzyme linked immunosorbant assay (ELISA) which was used as a confirmatory test. Those patients who were positive by ICT but negative by ELISA were advised PCR for HBV and HCV for confirmation. All those patients who were HBV or HCV positive by confirmatory tests were considered for computing the seroprevalence of HBV and HCV. Their complete blood counts were done on automated haematology analyzer (sysmax KX21). Giemsa stained (Merck) blood film prepared from 3 ml anticoagulated venous blood sample was used for microscopic examination of peripheral blood. The bone marrow was aspirated with the help of a 16 gauge sterilized disposable needle. In children less than 18 months of age the sample was taken from tibia, in older patients the sample was taken from posterior iliac spine under local anaesthesia (2% lignocain by Barrett Hodgson).Bone marrow was examined for morphology by using giemsa stained slides. Marrow iron was estimated by using pearl stained slides. Myelogram was done on bone marrow slides by an experienced haematologist. Data obtained from the viral study, blood and bone marrow examination were entered in a Performa specially designed for this purpose. The data was processed using SPSS 18 for windows. The results were expressed in tables. Informed written consent was taken from every patient at the time of enrolment in the study. The study was approved by the institutional ethical review committee.

RESULTS

Results of our study are shown in tables 1 to 5. A total of 30 patients were positive for hepatitis B or hepatitis C, comprising 14 male and 16 females. Hepatitis B had equal prevalence in males and females, male to female ratio being 1:1. On the other hand, hepatitis C was more prevalent in females (male to female ratio 0.78:1). Table 1. As much as 10/30(33.33%) patients with hepatitis B and 12/30 (40%) with hepatitis C were in the age group more than 20 years (table.2). Anaemia was the commonest (40%) haematological abnormality seen both in male and female patients with hepatitis B or Hepatitis C, followed by thrombocytopenia (23.34 %), leucopenia (13.33%), pancytopenia(13.33%) and bicytopenia (10%) respectively (table 3).Bone marrow examination revealed increased number of megakaryocytes in 10.8%, lymphocytes in7.7 % and absent marrow iron in 15.7% patients with hepatitis B or hepatitis C (table 4) History of exposure to risk factors (blood transfusion, surgical procedure, tattooing, ear and nose piercing) etc was positive in 2 patients (6.7%) with hepatitis C.

Table No.1: Frequency of Hepatitis B and Hepatitis C (n=1000)

Gender	Hepatitis-B		Hepatitis-C	
	No	%	No	%
Male	07	0.7	07	0.7
Female	07	0.7	09	0.9
M:F	1:1		0.78:1	

Table No. 2 Age wise distribution of HBV & HCV positive patients

Age Group	Hepatitis-B		Hepatitis-C	
	No	%	No	%
<20 Years	01	3.33	02	6.66
20-40 Years	02	6.66	03	10.00
40-60 Years	08	26.66	09	24.73
>60 Years	03	10.00	02	6.66
Total	14	46.65	16	48.05

Table No.3 Frequencies of haematological abnormalities in HBV and HCV positive patients

Parameter	Male		Female		Total
	HBV %	HCV %	HBV %	HCV %	No %
Anaemia	03 10	02 06.66	04 13.33	03 10	12 40.00
Thrombo-cytopenia	02 6	02 06.66	02 06.66	01 03.33	07 23.34
Leucopenia	02 6	01 03.33	00.00	01 03.33	04 13.33
Pancytopenia	00 00	01 03.33	01 33.33	02 06.66	04 13.33
Bicytopenia	00 00	01 03.33	00.00	02 06.66	03 10.00
Total	07	07	07	09	30

Table No.4 Bone marrow picture of HBV & HCV positive patients

Parameter	Number of patients		
	Increased	Decreased	Normal
Cellularity	00	00	30
Erythropoiesis	00	00	30
Myelopoiesis)	00	00	30
M:E ratio	00	00	30
Megakaryocyte	07 (10.8 %)	00	23
Lymphocytes	05(7.7%)	00	25
Plasma cells	00	00	30
Abnormal cells	00	00	00
Stainable Iron	00	10 (15.4 %)	20

Table No.5: Haematological Profile of HBV & HCV positive patients

Parameter	Male				Female			
	HBV		HCV		HBV		HCV	
Hemoglobin(g/dl)	13 -16.5 < 13	12 03	13 -16.5 < 13	15 02	12 -14.5 < 12	02 04	12 -14.5 < 12	04 03
WBC ($x10^3$/µl)	4 -11 < 4	18 02	4 -11 < 4	16 01	4 -11 < 4	09 00	4 -11 < 4	08 01
Platlets ($x10^3$/µl)	150 -450 < 150	15 02	150 -450 < 150	15 02	150 -450 < 150	06 02	150 -450 < 150	07 01
MCV (fl)	>97 < 75	01 19	>97 <75	02 18	>97 <75	03 07	≥150 ‹450 <75	02 08
MCH(pg)	27-32 <27	02 18	27-32 <27	03 17	27-32 <27	00 10	27-32 <27	00 10

DISCUSSION

The focus of our study was haematological profile as well as the status of hepatitis B and C in patients who were advised bone marrow examination. Many studies have been conducted on screening of patients before doing any invasive procedure and have revealed variable results. In a study conducted in Sind on patients undergoing surgery, hepatitis B was seen in 3.6% and hepatitis C in 12.8 % patient's .In another study, hepatitis B was seen in 2.3% males and 1.3 % females while hepatitis C in 7.4% males and 5.3% females[9]. In a study conducted on patients undergoing percutaneous mitral valvuloplasty, hepatitis B and C was seen in 14% and 8% patients respectively[10]. In a hospital based study conducted on more than 2000 patients, pre-surgical screening by immunochromatographic technique revealed that 10.8% &5.7% patients were positive for hepatitis B and C respectively [11]. A study conducted on 1500 patients waiting for elective gyenaecological surgery were screened by third generation ELISA technique at AFIP Rawalpindi revealing hepatitis B & C in 1.33% & 10.39% patients respectively [12]. In a study conducted at a tertiary care hospital in Abbottabad, as much as 4.1% patients had hepatitis B or hepatitis C infection[13]. In a similar study conducted on 387 patients in Islamabad, seroprevalence of hepatitis B and C was 65 and 11.3 respectively [14]. In another study conducted at Islamabad seroprevalence of hepatitis C abd B was 5.3% and 2.5% respectively[15].A similar study from Punjab revealed results opposite to this[16].

In the present study, the frequency of hepatitis B and hepatitis C was 0.9% and 0.7 % respectively, much less than the figures previously reported for the other invasive procedures. A fall in prevalence rate of hepatitis B and C has been observed in the recent years; probably due to the increasing disease awareness as well as vaccination and prevention campaigns against hepatitis B and C. Haematological parameters observed in the present study are worth mentioning. It is evident from the results that most of the symptomatic patients had anaemia followed by thrombocytopenia, pancytopenia and bicytopenia in the decreasing order of frequency. The patients had not been previously tested for hepatitis B or C and hence never received any sort of treatment for the same. It is more likely that the cytopenia seen in the study was mainly due to peripheral destruction rather than bone marrow suppression by the viral factors, or any antiviral treatment. Increased number of megakaryocytes in marrow might have also been due to peripheral destruction of platelets due to viral factors. Increased number of lymphocytes in bone marrow seen in 7.7% patients might have also been due to the same reason but not proven as it was beyond the scope of study. Seroprevalence of hepatitis B and hepatitis C varies from region to region. Some researchers have reported very high incidence of hepatitis C in patients referred for bone marrow. These patients had thrombocytopenia in 85% patients[17]. Our findings are not in accordance with this study.

In Pakistan, studies on haematological parameters of patients receiving interferon therapy, as well as haematological malignancies in patients with hepatitis C have been conducted[18-19]. But our literature is silent on haematological profile of untreated patients with hepatitis B and C, which has been the focus of present study. Whatever reason may be, it is evident from the results of all the studies that any patient undergoing invasive procedure, (weather minor or major) must be screened for hepatitis B and C by default. Our study has revealed that patients presenting with cytopenia must be screened for hepatitis B and C before referring for bone marrow examination. This will not only prevent the spread of hepatitis, but will also provide an opportunity for its timely treatment. Our study in this regard is a unique one, as no other study has been conducted previously on this aspect of disease prevention, particularly in patients undergoing bone marrow examination in our country.

CONCLUSION

Hepatitis B and C infection is one of the causes of cytopenia, screening for HBV and HCV is mandatory

before doing further workup of any patient with cytopenia**.**

Recommendations: We recommend that any patient with cytopenia should be screened for hepatitis B and C before proceeding further. We also support the recommendations of adopting a broad based, solid, persistent policy and effective disease prevention strategy covering multiple aspects of spread and treatment of hepatitis and legislative measures in this regard are the need of the day, if we want to solve this important health problem on permanent basis[20].

Author's Contribution:

Concept & Design of Study:	Jamila Farid
Drafting:	Muhammad Idris
Data Analysis:	Nasreen Gul
Revisiting Critically:	Jamila Farid, Muhammad Idris
Final Approval of version:	Jamila Farid

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

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