PREVALENCE OF HEPATITIS 'B' AND 'C' AND IMPORTANCE OF COAGULATION PROFILE IN PATIENTS PRESENTING TO ORTHOPAEDIC WARD OF A TERTIARY CARE HOSPITAL

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Abstract

Background: Hepatitis B (HBV) and C (HCV) virus infections are emerging as a challenge world over due to the wide spread clinical spectrum and complications associated with these infections leading to a high morbidity and mortality rate. This study was carried out to determine the prevalence of HBV and HCV infections in patients presenting to the Orthopaedic department in our local population.

Methods: This study was conducted from 9th march 2015 to 8th march 2016 on a total of 1991 patients who underwent elective surgical procedure. Age and sex were not specified in the inclusion criteria. Qualitative Immunochromatography was done to screen the serum of patients and determine the presence of Hepatitis B surface antigen (HBsAg) and Anti Hepatitis C virus antibodies (Anti HCV antibodies). Prothrombin time (Pt) measured for hepatitis positive patients pre-operatively.

Results: Out of the 1991 patients, 83 (4.2%) tested positive for HBV or HCV infection. 28 (1.4%) were HBsAg and 55 (2.8%) anti HCV antibody positive. 31 (37.3%) patients with these infections had prolonged Pt requiring transfusion of Fresh Frozen Plasmas (FFPs) pre-operatively. Bleeding was observed from the surgical wound site in only 4 (4.8%) of the patients with these infections.

Conclusion: Patients who present to Orthopaedic wards have high prevalence of HBV and HCV. Adequate screening should be carried out in all these patients so that measures can be taken to prevent its transmission.

Keywords: Anti Hepatitis C virus antibodies (Anti HCV antibodies), Fresh Frozen Plasma (FFP), Hepatitis B surface antigen (HBsAg), Immunochromatography, Prothrombin time (Pt).

Introduction

Cirrhosis and Hepatocellular carcinoma (HCC) are major complications of Hepatitis B (HBV) and C (HCV) virus infections which are on a rise due to the increasing prevalence of these infections worldwide.(1) Pakistan like other developing nations is no exception to these infections.(2) This rapid spread in underdeveloped countries may be attributed to the illiteracy, poverty, lack of awareness, scarcity of resources and high cost of tests.(3,4) Hepatitis B and C are blood borne viral infections which cause liver damage and may result in end stage liver disease. Infected body fluids are known vehicle for Hepatitis B transmission and include blood, semen and saliva. Blood transfusions, needle stick injuries and intravenous drug abuse contribute to these modes of spread. Mother to baby transmission (perinatal transmission) is more common in Hepatitis B endemic areas whereas in non-endemic areas sexual behavior is a major determinant.(5) The major route of transmission for Hepatitis C is parenteral. Transfusion and transplantation from infected person are the main culprits with relatively minor contribution from using contaminated needles, infusion bags and intravenous drug abuse.(6) Patients may present with complications of hepatitis many years after the initial infection or maybe asymptomatic and may present to the hospital with no awareness about their prevailing condition. The presenting complaints associated with hepatitis B range from constitutional symptoms of fever, nausea, vomiting to gastrointestinal bleeding and liver failure.(7) Hepatitis C patients present with malaise, easy fatigability and include extrahepatic manifestations like cryoglobulinemia and glomerulonephritis. End stage liver disease is common to both.(8) Compromised liver function as a result of liver cirrhosis leads to deranged coagulation profile putting the patient at perioperative risk. Hemodynamic instability during surgeries can further deteriorate liver function leading to serious complications.(9) To assess the synthetic liver function, Prothrombin time (Pt) is the standard and most specific indicator.(10) Fresh Frozen Plasma (FFP) is transfused to treat coagulopathy in liver dysfunction and continued bleeding.(11) A decline has been seen in the prevalence of HBV infection which may be due to the vaccination schemes initiated by the government at large scale including its administration to new born babies of affected mothers, health care workers and the increasing awareness regarding this disease whereas a rise was observed in HCV infection.(12,13)

Patients undergoing elective and emergency procedures infected with HBV and HCV are increasing at an exceedingly large rate which not only puts other patients at risk but also the surgeons and staff members are also prone to it if preoperative screening is not done.(14) Therefore, this study was done to determine the prevalence of HBV and HCV infection in patients who presented to the Orthopaedic department of a tertiary care hospital and the importance of coagulation profile.

Methodology

A total of 1991 patients who presented to the Orthopaedic Department of Benazir Bhutto Hospital, Rawalpindi, Pakistan from 9th march 2015 to 8th March 2016 for elective surgical procedures were included in the study. It was a descriptive study. Age and sex were not specified in the inclusion criteria. Patients who were operated in the emergency department or those who were not admitted to the Orthopaedic ward were excluded from the study group. A preset questionnaire was used to collect the required data from the study group after taking an informed consent. Study was conducted after approval from the ethical review board of the hospital.

5mL of blood was withdrawn from all patients fulfilling the criteria to screen for HBV and HCV. It was centrifuged to separate the serum which was divided into two parts. Qualitative Immunochromatography was done to determine Hepatitis B surface antigen (HBsAg) in one part and antibodies to HCV in other part of the serum obtained. Enzyme Linked Immunosorbent Essay (ELISA) was done in those who tested weakly positive. Prothrombin time (Pt) was determined for patients who tested positive for HBV and HCV. The measured results were compared with those in a control group in hospital laboratory and a Pt of 5 seconds or more was considered prolonged. Fresh Frozen Plasmas (FFPs) were transfused in patients with deranged coagulation profile 1-2 hours before surgery.

Data analyzed with SPSS version 23. Frequencies and percentages determined for categorical variables. Variables such as gender, prolonged Pt, FFPs transfused and post-operative bleeding compared using Chi-square test. p value significant if less than 0.05.

Results

In this study, 1991 patients who presented to the Orthopaedic ward were included. Out of these, 83 (4.2%) patients were found positive for HBV or HCV infection. HBsAg was found in 28 (1.4%) while 55 (2.8%) patients were anti-HCV positive upon screening (table 1).

Table 1 : Gender distribution of Hepatitis positive patients

		Gender		Total	p-value
		Male	Female		
Variables		n (%)	n (%)	n (%)	
Type of Hepatitis	Hepatitis B	17 (20.5%)	11 (13.3%)	28 (33.7%)	0.82
	Hepatitis C	32 (38.6%)	23 (27.7%)	55 (66.3%)	
Total (n) (%)		49 (59%)	34 (41%)	83 (100%)	

31 (37.3%) patients positive for hepatitis had a prolonged Pt of more than 5 seconds. 4 (4.8%) had post-operative oozing of blood even after transfusion of FFPs (table 2).

Table 2: Distribution of patients with prolonged Pt and post-operative bleeding

		Type of Hepatitis		Total	p-value
		Hepatitis B	Hepatitis C	n (%)	
Pt > 5 seconds prolonged	Yes	9 (10.8%)	22 (26.5%)	31 (37.3%)	0.48
	No	19 (22.9%)	33 (39.8%)	52 (62.7%)	
FFPs transfused	Yes	9 (10.8%)	22 (26.5%)	31 (37.3%)	0.48
	No	19 (22.9%)	33 (39.8%)	52 (62.7%)	
Post-operative bleeding	Yes	1 (1.2%)	3 (3.6%)	4 (4.8%)	0.70
	No	27 (32.5%)	52 (62.7%)	79 (95.2%)

Figure 1: Statistics regarding FFPs transfused & post-operative bleeding

Discussion

Hepatitis B and C lead to significant morbidity and mortality world over especially affecting the underdeveloped countries like Pakistan.(4) The factors which predispose to this infectious disease include history of transfusion of blood, use of unsterilized injections, those who underwent dental procedures and previous history of surgery.(15,16) Deliveries by untrained staff in unhygienic conditions without sterilized instruments increases the vulnerability in females. Therefore, nosocomial exposure is the main culprit in HBV and HCV infections. Majority of the HBV and HCV patients are asymptomatic and therefore increase the risk of spreading this infection in the society and to health care professionals especially when being operated upon. The risk associated with contracting blood borne viruses (HBV, HCV and HIV) during surgery has been shown by many studies. The degree of this association for the health care professional depends upon the number and nature of surgical procedures he has been participating in, use of sharp instruments and exposure to body fluids, prevalence of these diseases in the patients, prophylactic measures including vaccination and steps taken to prevent the progression of disease after exposure has occurred.(17,18) According to a study carried out by Harpe et al, there is 1% chance for surgeons to acquire HBV

infection.(19) In a similar study, accidental exposure leading to HCV transmission in anaesthesiologists was found to be 2%.(20) Frequent handling of sharp instruments and bone shreds further predisposes the Orthopaedic surgeons to this occupational risk.(21) According to a survey carried out by Ali et al, as many as 7% of all operations are associated with injuries and 87% of all surgeons receive a cut or other form of injury during their career.(22) These sharp injuries incurred during surgical procedures are not reported most of the time.(23,24) Therefore all patients presenting to hospitals should be screened prior to any surgical procedure in order to prevent transmission of HBV and HCV to other patients and medical staff.

The study carried out by us showed high prevalence of HBV and HCV. 1.4% of the patients who presented to the Orthopaedic department were positive for HBsAg whereas Anti HCV antibodies were found in 2.8% of patients. The results of our study were comparable to one of the study done on Orthopaedic patients of Ayub teaching hospital, Abbottabad, which showed 2.02% having HBV and 3.12% with HCV infection.3 One of the study done during the operative practice of an Orthopaedic surgeon showed 1.09% positive for HBV while 4.06% with HCV infection.(25) A study done at a tertiary hospital in Greece found 1.7% patients with HBV and 2% HCV positive.(26) In one of the local study done by Shaikh et al showed 13.45% patients as HCV positive and 2.15% HBV positive, the results of this were in accordance to our and other studies as it showed a high prevalence of HCV.(27)

In our study, blood sampling of patients was done immediately upon their admission to the Orthopaedic ward to eliminate any risk of transmission during diagnostic or therapeutic procedures in the hospital. Prothrombin time (Pt) was performed in all patients having HBV or HCV infection. In our study, 10.8% HBV and 26.5% HCV positive patients had prolonged Pt. Fresh frozen plasma (FFPs) were transfused in these patients per-operatively to prevent major complications such as bleeding, and this resulted in a better outcome. Post-operative bleeding from the site of surgery was seen in 4.8% of the patients. Hence, the importance of screening for hepatitis B and C in all patients who present to Orthopaedic ward and monitoring of prothrombin time pre-operatively and transfusion of FFPs in these patients accordingly cannot be denied. To prevent this rapidly increasing prevalence of HBV and HCV infections, there is a need to educate the general population about their risk factors and preventive measures as well as the prophylactic role of vaccination in HBV infections especially in the high-risk population, including medical personnel. Routine screening for their diagnosis should be done in patients presenting to Orthopaedic wards.

Conclusion

HBV and HCV infections have a high prevalence in patients presenting to Orthopaedic wards, and many have deranged coagulation profile, which demands a need to monitor that pre-operatively in order to minimize the per- and post-operative complications. HBV or HCV positive patients with prolonged Pt should have blood products especially FFPs arranged so that they can be transfused as required.

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