Original Article

Newly Diagnosed Hepatitis-B and Hepatitis-C during Surgical Pre-operative Assessment of Patients from Lower Socioeconomic Class; Frequency, Risk Factors and Vaccination Status

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ABSTRACT

OBJECTIVE: To see the frequency of newly diagnosed Hepatitis-B and Hepatitis-C cases during pre-operative surgical assessment of patients from lower socioeconomic class and to study the possible risk factors.

STUDY DESIGN: Descriptive Cross Sectional study.

SETTING: Department of Surgery, Sir Syed College of Medical Sciences and Hospital, Karachi.

STUDY DURATION: From July 2012 to July2013.

MATERIAL AND METHODS: Total 107 patients (≥18 years)of both genders from lower socioeconomic class planned for elective surgical procedure were included after ethical approval. Previously diagnosed cases of Hepatitis-B and C were excluded. After history and clinical examination, Hepatitis-B &Hepatitis-C serology was performed (ELIZA technique). History of blood transfusion, previous dental or surgical procedures, intravenous injections, intravenous drug abuse, tattooing, piercing, circumcision, shaving by barbers, unprotected sex and Hepatitis-B vaccination status obtained. Data was analyzed by SPSS version 17.

RESULTS: Among 107 cases (42% males & 58% females) with mean age 39±14 years, Hepatitis-B infection was present in 6(6%) cases, Hepatitis-C in 11(10%) and Hepatitis-B and C serology was negative in 90 (84%) cases. Frequency of Hepatitis-B was 3% (in males) versus 9% (in females); Hepatitis-C 6.4% (in males) versus 15.5% (in females). Among those with Hepatitis-B or C, history of previous surgical procedure present in 47% cases (vs. 21% in Hepatitis-B and C negative cases), dental procedure in 29.4% (vs. 7.7 %), intravenous injections in 94% (vs. 43%), intravenous drug abuse in 5.8% (vs. 0 %), blood transfusion in 35% (vs. 12%), tattooing in 0% (vs. 2%), unprotected sex in 5.8% (vs. 1%), piercing in 64.7% (vs. 39%), circumcision by barbers in 83.3%of males (vs. 80%), shaving by barbers in 66.6% of males (vs. 27%). Hepatitis-B and C was found to be associated with history of blood transfusion, intravenous injections, dental procedures, shaving by barbers, piercing and intravenous drug abuse ($p< 0.05$). Clinical stigmata of liver disease were present in 3% cases. Among all cases 9% were previously vaccinated for Hepatitis-B.

CONCLUSION: Preoperative determination of Hepatitis viral markers is a good clinical practice to limit transmission from asymptomatic carriers and to diagnose new cases. Pakistan has high prevalence of Hepatitis-B and C and poverty and low literacy rate are the main determinants of its spread. Those who are negative for Hepatitis-B should be encouraged to get vaccinated. There is need for measures to create awareness about preventive measures and affective control of transmission of Hepatitis-B and C in community as well as at health care facilities.

KEY WORDS: Hepatitis-B. Hepatitis-C. Pre-operative Assessment.

INTRODUCTION

Hepatitis-B and Hepatitis-C viral infection has been the major health problem all over the world.[1] WHO reported the prevalence of Hepatitis-B and C vary widely in various countries. Certain countries like Canada and Australia, with prevalence <1% are labeled as countries of low endemicity. United States of America and Europe,with prevalence 1 % are labeled as countries of medium endemicity. However Africa, Central and South Asia having prevalence>2% are labeled as high endemicity areas.[2] Pakistan being a high endemicity country, is facing a major challenge to control the spread and reduce prevalence of Hepatitis-B and C. Due to low literacy rate, unhealthy social practices, poverty and insufficient health facilities, we are unable to reduce its transmission and prevalence effectively.

Existing literature refers to rising prevalence of Hepatitis-B and C in our population. Though exact prevalence in Pakistani population is still unknown, data from regional studies has shown that Hepatitis-B seropositivity is approximately 5% and that for Hepatitis-C is 13%.[3,4,5] Hepatitis-B and Hepatitis-C being a preventable disease, urges the need for measures to control its spread in community.

Hepatitis-B or Hepatitis-C infections may be initially asymptomatic, or may progress to chronic phase with complications like liver cirrhosis, portal hypertension, gastrointestinal bleed, coagulopathy, hepatic encephalopathy, fulminant hepatic failure and hepatocellular carcinoma. Few patients of Hepatitis-B may become sero-negative in the early period. However, in Hepatitis-C viral infection, most of the cases have been observed to progress to chronic phase.[6]

The modes of transmission for these viral hepatitis being intravenous injections, intravenous drug abuse, needle prick injuries, unscreened blood transfusions, exposure to unsterilized instruments during surgical or dental procedure, tattooing, piercing, unsterilized blades used by barbers, unprotected sex and vertical transmission from mother to fetus during delivery.

This chain of transmission can be halted at various levels by improving hygiene, adapting standard recommendations for sterilization and improving vaccination status in the community. Vaccine for Hepatitis-B has been effective in controlling the spread. However, unfortunately no vaccine is available to date for Hepatitis–C and the only way to limit its spread is adaptation of preventive measures. Once infection is acquired, early diagnosis and intervention not only improves morbidity and mortality but also helps us to take measures to prevent its spread and screen the contacts.

There have been several community based and hospital based studies conducted to assess the prevalence of Hepatitis-B and C. Regional studies have reported higher prevalence as compared to international data being provided by WHO and CDC. Our hospital being located in an area with maximum number of patients from lower socioeconomic class and low literacy level. This gives us an opportunity to assess the frequency and risk factors in this community. As compared to other locally conducted studies that have focused only on the frequency, we have availed this opportunity to inquire and evaluate the possible risk factors in our patients from lower socioeconomic class. This will help us to address particular factors regarding vaccination status, lack of awareness and commonly seen modes of transmission in our patients.

PATIENTS AND METHODS

This descriptive cross sectional study was conducted at Dept. of Surgery, Sir Syed College of Medical Sciences and Hospital, Karachi. Patients planned for elective surgical procedure during the specified duration were included after ethical approval from institutional committee. Patients of both genders having age $\geq$18years were included. Only the patients labeled as lower socioeconomic class as per annual income documented by economic survey of Govt. of Pakistan were included (i.e. having annual income <500 dollars; approx. <5000 Rupees/month).[7] Previously diagnosed or treated cases of Hepatitis-B or Hepatitis-C were excluded. Informed consent obtained and demographic details (name, age, gender, address, monthly income and contact address) were documented. Detailed history and clinical examination was performed for presence of jaundice and other liver disease.

Patients were then inquired about the possible risk factors including history of previous surgical procedure, blood transfusion, intravenous injections, intravenous drug abuse, previous dental procedure, tattooing, piercing, shaving from barbers, whether circumcision was done by doctor in a medical center or at home by barber, unprotected sex and Hepatitis-B vaccination status. Patients were then advised complete blood counts, liver function tests, coagulation profile, ultrasound abdomen as per indication in each case. Hepatitis-B surface antigen and Anti-HCV antibodies were performed in all the cases by Eliza technique. Those who were found to be sero-positive were evaluated for PCR followed by further workup of liver disease. Patients were evaluated in co-ordination with Dept. of Medicine and guidance about future management plan provided. All the information was documented on a specially designed proforma.

Results were analyzed using SPSS version 17. Age presented as mean$\pm$SD. Descriptive variables (gender, presence of various risk factors and Hepatitis -B vaccination status) presented as frequencies and percentages. Chi-square test was used to determine association between Hepatitis-B or C infection and various risk factors. *P*-value <0.05 is considered as significant. Data is presented in the form of tables, bar graphs and charts.

RESULTS

Total 107 patients were included in the study. There were 42% males and 58% females. Mean age was 39$\pm$14 (18-80 years). Hepatitis-B infection was present in 6(5.6%) cases and Hepatitis-C in 11(10.2%) (Fig I). Frequency of Hepatitis-B was 3% (in males) versus 9% (in females) and that of Hepatitis-C was 6.4 % (in males) versus 15.5% (in females) (Table I). Hepatitis-B and C was negative in 90 (84 %) cases.

History of intravenous injections in those with Hepatitis

-B and Hepatitis-C was 94% (vs. 43% in those without Hepatitis-B or Hepatitis-C), history of surgical procedure in 47% (vs. 21%), dental procedures 29.4 % (vs. 7.7%), tattooing 0% (vs.2%), piercing 84.7% (vs.39%), shaving by barbers in 66.6% males (vs.27%), circumcision by barbers in 83% males(vs.80%)and history of blood transfusion in 35% (vs. 12%) (Table II). Significant association was found between presence of Hepatitis-B and C and history of blood transfusion, intravenous injections, dental procedures, shaving by barbers, piercing and intravenous drug abuse ($p<0.05$). Liver function tests were deranged in 7(6.5%) cases. Jaundice and other stigmata of liver disease were present in 3% cases. Among all, 10(9%) cases were found to be vaccinated against Hepatitis-B.

FIGURE I: PIE CHART PRESENTATION OF HEPATITIS-B AND HEPATITIS-C SERO-POSITIVITY DURING PRE-OPERATIVE SCREENING (n=107)

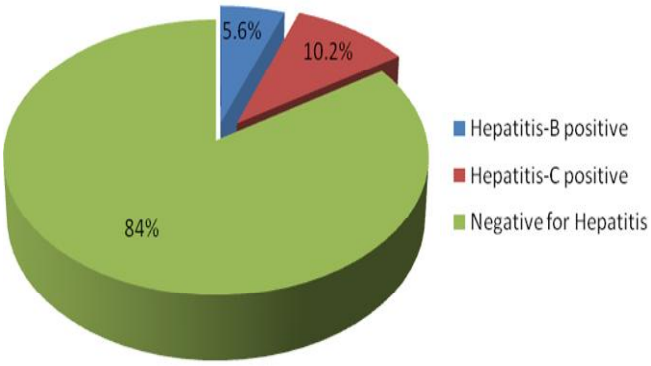


TABLE I: FREQUENCY OF NEWLY DIAGNOSED HEPATITIS B AND C WITH RESPECT TO GENDER DURING SURGICAL PREOPERATIVE SCREENING (n=107)

Serology (by ELIZA)	Among all n (%) n=107	Among males n (%) n =62	Among females n (%) n =45	*P*-value
Hepatitis-B or C	17(16%)	6 (9.6%)	11(24.4%)	0.039*
• Hepatitis B • Hepatitis C	6(6%) 11(10%)	2 (3%) 4 (6.4%)	4(9%) 7(15.5%)	
Negative for Hepatitis	90(84%)	56 (90%)	34(75.5%)	

*P< 0.05 is significant

TABLE II: VARIOUS RISK FACTORS FOR MODE OF TRANSMISSION IN PATIENTS WITH AND WITHOUT HEPATITIS-B AND HEPATITIS-C

Risk factors	Among all n=107	Hepatitis B/C negative n=90	Hepatitis B/C positive n=17	*P*-value
Surgical Procedure	28 (26%)	19 (21%)	8 (47%)	0.074
Blood transfusion	17 (16%)	11 (12%)	6 (35%)	0.017*
Intravenous injections	55 (51%)	39 (43%)	16 (94%)	<0.0001*
Intravenous drug abuse	1 (0.9%)	0 (0%)	1 (5.8%)	0.021*
Dental procedure	12 (11%)	7 (7.7%)	5 (29%)	0.010*
Unprotected sex	2 (1.8%)	1 (1%)	1 (5.8%)	0.183
Shaving by barbers (among males)	19 (31%) n =62	15 (27%) n =56	4 (67%) n =6	0.044*
Piercing	46 (43%)	35 (39%)	11(65%)	0.049*
Circumcision (males) By Doctor By Barber	11 (17.7%) 50 (80.6%) n =62	10 (17.8%) 45 (80%) n =56	1 (16.6%) 5 (83.3%) n =6	0.890
Tattooing	2 (1.8%)	2 (2%)	0 (0%)	0.535
Vaccinated for Hepatitis-B	10 (9%)	10 (11%)	0 (0%)	0.149

*P< 0.05 is significant

FIGURE II: BAR GRAPH PRESENTATION OF FREQUENCY OF HEPATITIS-B AND HEPATITIS-C DURING PRE-OPERATIVE SCREENING WITH RESPECT TO GENDER

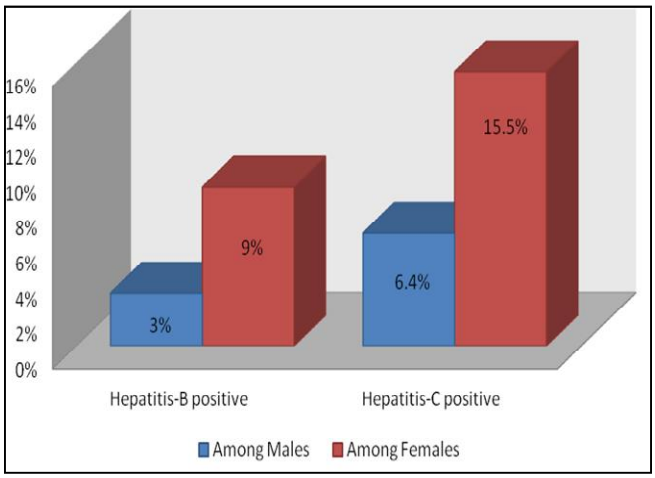
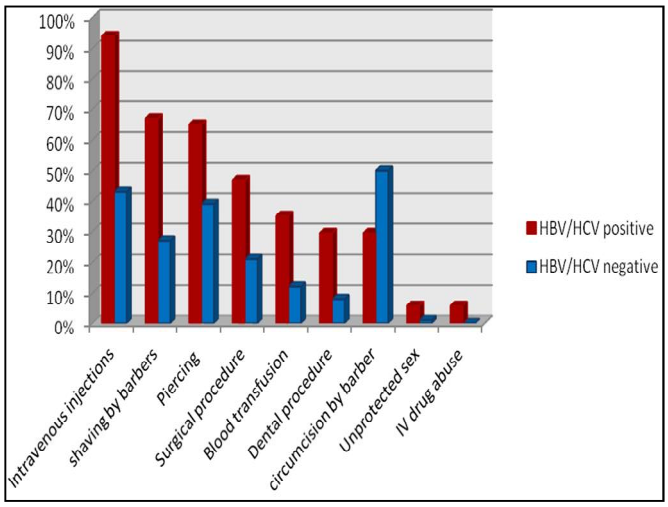


FIGURE III: BAR GRAPH PRESENTATION OF VARIOUS RISK FACTORS EXPOSURE IN RELATION TO HEPATITIS-B AND HEPATITIS-C SEROLOGY



DISCUSSION

Hepatitis-B and Hepatitis-C infection is one of the major challenges faced all over the world. Most of the developed countries have effectively controlled this problem by focusing on vaccination and controlling the risk factors for transmission in the community. However, several developing countries including Pakistan are still unable to effectively control this communicable disease.

Several screening programsare being conducted at various levels to diagnose asymptomatic carriers of Hepatitis-B and C. The screening in pre-operative patients has now been routinely conducted in our country as well. The benefits of this preoperative screening extend beyond the patient himself. These include the specific precautions taken by the involved surgical team, measures to avoid complications in patient during the procedure and in the post-operative recovery period, screening and identifying the contacts of the patient, staging the liver disease and offering appropriate and timely intervention.[8]

In our study, prevalence of Hepatitis-B and Hepatitis-C is found to be 16%. This is comparable to regional studies that show prevalence of 16-22%.[9,10,]However this figure is higher as compared to international studies conducted in Africa and India, that show prevalence of3-6 %.[11,12,]This reflects the regional high endemicity of viral Hepatitis in Pakistan as compared to other international and neighboring countries.[22]Thus suggesting that we are still unable to effectively implement the measures to limit the transmission and control the risk factors in our community.

The prevalence of Hepatitis-C (10.2%) is found to be more as compared to Hepatitis-B (5.6%) in our study. Other regional studies conducted in Pakistan have found Hepatitis-C to bemore prevalent than Hepatitis-B.[13,14,15,,] However, an international study conducted by Anbazhaganet al in Sri Lanka shows higher prevalence of Hepatitis-B as compared to Hepatitis-C.[16] A study conducted in Ethiopia by Tessema et al on blood donors also shows higher prevalence of Hepatitis-B (4.7%) as compared to Hepatitis-C(0.7%).[17] In view of this, there is a need to not only focus on vaccination for Hepatitis-B, but also to control the risk factors to limit transmission of viral hepatitis.

In view of gender, prevalence for Hepatitis-B was 3% in males versus 9%in females in our study group. For Hepatitis-C it was 6.4% in males versus 15.5% in females (Fig II). Thus indicating higher prevalence of both Hepatitis-B and C in females in our study group. This is contrary to other regional and international studies that show prevalence in males almost double as compared to the females.[18,19,20,,]Higher prevalence in females in our study could possibly be due to increased exposure to risk factors among females, lack of awareness, low literacy level, financial and social constraints to seek appropriate medical care.

History of intravenous injections, surgical procedures, dental procedures, shaving by barbers, circumcision by barbers, piercing and blood transfusions was more frequently seen in patients with Hepatitis-B or C than those without. Also, these figures are even higher than mentioned in other regional studies (Fig III). This is possibly due to lack of awareness in lower socio-economic class about modes of transmission of viral hepatitis and preventive measures at community level. Also proper screening of blood needs to be assured by the blood banks, health care facilities and regulatory authorities.

In a study conducted in Jacobabad by Daudpota et al in 2007, there was history of previous surgical procedure in 14% and history of blood transfusion in 5.7%.[1010]These figures are reported to be higher in our study. This suggests that there is need to improve the sterilization techniques and screening of blood. The above mentioned study by Daudpota et al used the ICT KIT method for detection of Hepatitis-B and C; however we used the ELIZA method that is considered to yield more reliable results.

We have included the additional risk factors like history of intravenous injections, unprotected sex, circumcision history and shaving by barbers in our study. Our study shows that 83% patients had history of circumcision by barbers; this is comparable to figure of 86% in a study conducted by Jamil et al.[21]However, circumcision by barbers was not found to be associated with Hepatitis-B and C in our patients. Several studies have been conducted in Pakistan to determine the prevalence of Hepatitis-B and Hepatitis-C during preoperative assessment, but few have addressed the frequency of exposure to these community based risk factors, particularly in patients from lower socioeconomic background.

In our study only 9% cases were found to have previously been vaccinated for Hepatitis-B. Study conducted in Jacobabad Sindh by Daudpota et al seven years earlier showed that none of their patients was vaccinated against Hepatitis-B.[1010] Though our patients had higher vaccination status as compared to patients from remote area like Jacobabad. Certain number of countries have achieved their goal of Hepatitis-B vaccination and significant reduction in Hepatitis -B infection has been observed there.[22,23,] South Africa implemented the vaccination program with marked reduction in incidence of Hepatitis-B.[24] Iran and Thailand are other such examples.[25] Thus indicating the need for measures to improve vaccination status particularly in those at higher risk i.e. patients requiring hemodialysis, repeated blood transfusions or frequent parenteral therapies; doctors, paramedical staff and technicians belonging to medical profession.[26]

In view of these observations, we need to educate our community to avoid unnecessary use of intravenous injections, to transfuse properly screened blood, appropriate sterilization during dental and surgical procedures. Hepatitis-B vaccine has already been included in the vaccination program for children. However, those belonging to older age groups should also be educated and motivated to receive the vaccination.

Unfortunately, vaccine for Hepatitis-C has not been developed yet. Hence, the only means to reduce transmission of Hepatitis-C is to take measures to limit spread at all possible levels. These include the measures to be taken by electronic and print media to increase awareness in public to avoid unnecessary injectables, used syringes, used blades, sharing of tooth brushes, tattooing, piercing, unprotected sex and exposure to unsterilized instruments. On the other hand, great responsibility lies on the health care facilities, to ensure the proper disposal of infected material in hospitals and clinics and appropriate sterilization of instruments. Hereby we would also suggest further regional studies with larger sample size and inclusion of patients from various socioeconomic classes and rural versus urban areas of Pakistan as well.

CONCLUSION

The high prevalence of Hepatitis-B and C in our patients during the preoperative screening highlights the need for mandatory screening of all patients planned for elective procedure regardless of presence of significant history and clinical findings of liver disease. Main determinants of its spread are lack of awareness, illiteracy, poverty and unhealthy social practices.

REFERENCES

1. Miller ER, McNally S, Wallace J, et al. The ongoing impacts of Hepatitis C - A systematic narrative review of the literature. BMC Public Health. 2012;12:672.
2. Lavanchy D. Hepatitis B virus epidemiology, disease burden, treatment and current and emerging prevention and control measures. J Viral Hepat. 2004:**11**(2)**:**97-107.
3. Mahmood A. Hepatitis B virus: Prevalence in Karachi. J Coll Physicians Surg Pak. 2000;10(3):107 -8.
4. Janjua NZ, Nizami MAM. Knowledge and practice of barbers about Hepatitis B and C transmission in Rawalpindi and Islamabad. J Pak Med Assoc. 2004;54(3):116-9.
5. Hakim ST, Kazmi SU. Prevalence of Hepatitis-B Infection in healthy female University students in Pakistan.103rd General Meeting of American Society for Microbiology (ASM), Washington DC, USA 2003, V-017.
6. Lauer GM, Walker BD. Hepatitis C virus infection. N Engl J Med. 2001;345:41-52.
7. Government of Pakistan (2007-08). Household Integrated Economic Survey. Federal Bureau of Statistics of Pakistan.
8. Asthana S, Kneteman N. Operating on a patient with hepatitis C. Canadian Journal of Surgery. 2009;52(4):337-342.
9. Waqar-ul-Huda, Jameel N, Fasih U, et al. Prevalence of Hepatitis B and C in Urban Patients Undergoing Cataract Surgery.Pak J Ophthalmol 2013;29(3):147-50.

10. Daudpota AQ, Soomro AW. Sero-prevalence of Hepatitis B and C in surgical patients. Pak J Med Sci. 2008;24(3):483-84.
11. Günal Ö,BarutHS,TetikcokR, et al. Sero-provalences of hepatitis B virus(HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV) in preoperative patients admitted to a hospital in Northern Anatolia. Afr J Microbiol. 2011;5 (31):5669–73.
12. Ahmed R, Bhattacharya S. Universal screening versus universal precautions in the context of pre-operative screening for HIV, HBV, HCV in India. Indian J Med Microbiol. 2013;31:219-25.
13. Ahmed W, Arif A, Alam SE, Qureshi H. Changing trend of viral hepatitis - A twenty one year report from Pakistan medical research council research centre, Jinnah postgraduate medical centre, Karachi. J Pak Med Assoc. 2010;61:86-89.
14. Ali SA, Shah FA, Ahmed K. Prevalence of Hepatitis B and C Virus in Surgical Patients. Pak J of Surgery. 2007;23:109-12.
15. Choudhary IA, Khan SA, Samiullah.Should we do Hepatitis B & C screening on each patient before surgery? Pak J Med Sci. 2005;21:278-80.
16. Anbazhagan GK, Krishnamoorthy S, Thiyagarajan T. Seroprevalence of HCV and its co-infection with HBV and HIV among liver disease patients of South Tamil Nadu. World J Hepatol. 2010;2(1):42-48.
17. Belay T, Gizachew Y, Afework K, **et al**. Sero-prevalence of HIV, HBV, HCV and syphilis infections among blood donors at Gondar University Teaching Hospital, Northwest Ethiopia: declining trends over a period of five years. BMC Infectious Diseases 2010;10(1):111.
18. Khan F, Shams S, Qureshi ID, et al. Hepatitis B virus infections among different sex and age groups in Pakistani Punjab. Virol J. 2011 May (13);8:225.
19. Vazhavandal G., Vallab Ganesh Bharadwaj B, et al.Seroprevalence of hepatitis B virus among patients at a rural tertiary health care centre in South India: a four year study.Int J Res Med Sci 2014;2 (1):310-313.
20. Alauddin A, Khan AB, Dar MI, Kashmiri ZA, Batool A, Khan Q,et al. Prevalence of Hepatitis B and C among Cardiac Surgery patients in relation to post -operative recovery. Pak Heart J.2007;(40):31-37.
21. Aziz S, Khanani R, Noorulain W, Raiper J. Frequency of Hepatitis-B and C in rural and peri-urban Sindh. J Pak Med Assoc2010;60:853–7.
22. Whittel HE, Inskip H, Hall AJ. Vaccination against hepatitis B and protection against chronic viral carriage in Gambia. Lancet 1991;337:747-50.
23. Whittle H, Jaffar S, Wansbrough M, Maimuna-Mendy M, Dumpis U, Andrew Collinson A,et al. Observational study of vaccine efficacy 14 years after trial of Hepatitis- B vaccination in Gambian children. BMJ.2002;325:569.
24. Vryheid RE, Kane MA, Muller N, Schatz GC, S Bezabeh.Infants and adolescent hepatitis B immunization up to 1999.A global overview vaccine. 2000;19:1026-37.
25. Lankarni KB, Taghavi AR, Agah S, Karimi A. Comparison of intradermal and intramuscular administration of Hepatitis B vaccine in neonates. India J Gastroenterol 2001;10:94-6.
26. Shaikh MH, Shams K. Prevalence of HBV markers in health care personals vs. matchedcontrol. J Coll Physi Surg Pak. 1995;5:19-21.

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This article may be cited as: Shams N, Usmani F, Kumar N, Motwani R, Dahhri MM, Shaikh Z. Newly Diagnosed Hepatitis-B and Hepatitis-C during Surgical Pre-operative Assessment of Patients from Lower Socioeconomic Class; Frequency, Risk Factors and Vaccination Status. J Liaquat Uni Med Health Sci. 2014;13(03):106-11.