

**TO DETERMINE THE KNOWLEDGE, ATTITUDE, PRACTICES ABOUT HEPATITIS-B  
VACCINATION AMONG THE FINAL YEAR STUDENTS IN TERTIARY HEALTH  
CENTRE**

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**ABSTRACT**

**Background:** Hepatitis B virus poses a health risk to health care workers who are in close proximity to infected individuals. Medical students are particularly high risk group due to the lack of an obligatory vaccination programs and a post vaccination screening programs to determine immunity states which result in a lack of awareness and compliance with the HBV vaccine. **Methods:** This cross sectional study was conducted in Nishtar Hospital and Medical University Multan, Pakistan from Nov.2017 to April, 2018. Medical students of 5<sup>th</sup> year N=113(Man=46, woman=67) completed a self-administrated questionnaire regarding awareness of HBV and compliance with HBV vaccination programs in NMU, Multan, Pakistan. **Results:** Medium to high level of knowledge was present in 80% of the participants while 85% of the HBV vaccine upon entry to medical college, citing lack of easy access, fear of adverse effects, ignorance of common reasons of low compliance. There was no association between the knowledge and awareness of the participants and their compliance (P=0.922).

**KEYWORDS:** Hepatitis B virus, health care, HBV.

**INTRODUCTION**

Hepatitis B infection is a disease of the liver caused by the hepatitis B virus (HBV), which has a partially double stranded circular DNA and belongs to the family Hepadnaviridae.<sup>[1]</sup> The first biomarker of Hep. B virus was discovered by Blumberg. et al in 1965 and was named as "Australian Antigen". Subsequently, this biomarker was discovered to be the Hep.B surface antigen (HBsAg) Before the discovery of this Antigen, Hep. B was diagnosed on the basis of infection occurring within 60-180 days after the injection of human blood or plasma fraction or the use of inadequately sterilized needles. There are 4 phenotypes of HBsAg namely adw, ayw, adr, ayr. There are more than 7 genotypes of this virus. It has not yet been possible to propagate this virus in cell culture.<sup>[2]</sup>

Hepatitis B is a major public health concern worldwide. Approximately 30% of the world's population has been infected with HBV,<sup>[3]</sup> and more than 350 million are chronically infected with HBV and carry high risk for cirrhosis and liver cancer. At least one million people die annually from HBV related chronic liver disease.<sup>[4]</sup>

HBV is transmitted by body fluids, such as blood and serum, and can exhibit vertical transmission from mother to child. Sexual transmission, vertical transmission, and unsafe injections, including intravenous drug use, are the most common routes of infection for HBV.<sup>[5]</sup> Household contact and occupational health-care exposure to blood products and hemodialysis are other risk factors. Health care-workers (HCWs) are reported to have the highest occupational risk for HBV infection. There are 35-million HCWs worldwide, and percutaneous injuries have been estimated to result in approximately 66,000 hepatitis B viral infections per year.<sup>[6]</sup>

Data from the United States in the 1990s showed that unvaccinated HCWs had serologic evidence of past or current HBV infection three to five times greater than the general population. According to a study from Lahore, prevalence of HBsAg in normal subjects was 2.6%,<sup>[7]</sup> and 3.37% in blood donors of Multan.<sup>[8]</sup> A survey of the medical students showed that 30% of reported needle stick injuries occurred in the operation room.<sup>[9]</sup>

The clinical manifestations and natural history of HBV infection vary with age. Clinical acute hepatitis B is more frequent in adults than children, and the probability

of becoming a chronic carrier of hepatitis B is greater in children than adults: 80–90% of people perinatally infected compared to <5% of infections occurring in adults.<sup>[10]</sup>

Acute hepatitis B infection is an illness that begins with prodromal symptoms like anorexia, chills, headache, nausea, vomiting, and malaise. Development of jaundice may then occur but is noted in only 30% of all patients with acute infection. Acute hepatitis B is often unrecognized in children younger than five years old. Chronic infection with the HBV may be either asymptomatic or associated with chronic inflammation of the liver. After 10 years of chronic infection, about 20% of the patients with hepatitis B have progressed to cirrhosis and about 5% have developed HCC<sup>[11]</sup>. Chronically infected HBV patients have a 15–25% risk of dying prematurely due to HBV related cirrhosis and HCV.<sup>[12]</sup>

Hepatitis B virus has been linked to membranous glomerulonephritis, aplastic anemia, liver cirrhosis, liver carcinoma and fulminant hepatic failure etc. HBV and its ability to affect multiple organ systems including the liver and kidney, bone marrow in chronic infections is of particular concern. Hepatitis B is estimated to be the cause of 30% of cirrhosis and 53% of HCC worldwide.<sup>[13]</sup>

Also of note, prevention is the only safe strategy against high prevalence of viral hepatitis. Having enough knowledge and proper attitudes toward this infection is cornerstones of preventing transmission. Medical students have a very important role in preventing the disease by improving the disease knowledge among themselves and the patients they treat. Safe and effective HBV vaccines have been available since 1982. The implementations of mass immunization programs have been recommended by the World Health Organization since 1991. Since its global expanded coverage, the incidence of HBV infection and liver cancer among infants, children, and adolescents has dramatically decreased. Prevention is focused on vaccination of population groups most at risk. Included in these at risk groups are persons working in the health care field.

In this cross sectional study, we aimed to determine final year students' knowledge of HBV and vaccination as well as their compliance with the vaccination program at Nishtar Hospital Multan, Pakistan. In addition, we aimed to ascertain the relationship between awareness and preventive behavior and compliance with vaccine among the final year students because of the compulsory need of this knowledge to be applied in their upcoming period of house jobs and the preventive measures to be taken before their full exposure in the practical fields.

#### Operational Definitions

**Acute Hepatitis B:** Acute parenchymal liver damage caused by HBV lasting for less than 6 months.

**Chronic Hepatitis B:** Parenchymal liver damage caused by HBV lasting for 6 months or longer.<sup>[14]</sup>

#### Dosage Schedule for HB-Vaccine<sup>[15]</sup>

High risk infants;

1 dose given as **0.5 mL (5mcg)** IM at birth, followed by **2,4 and 6 months** of age

Children less than 11 years of age and adolescents 16-19 years of age;

2 doses given as **0.5 mL (5mcg)** at **0, 1 and 6 months**  
Eligible adults 20 years of age and older;

3 doses given as **1 mL (10 mcg)** IM at **0, 1 and 6 months**

#### MATERIAL AND METHODS

##### Study Design

Hospital based cross sectional study.

##### Setting

This study will be carried out in Nishtar Medical University and Hospital Multan.

##### Duration of Study

Six month after approval of synopsis.

##### Sample Size<sup>[16]</sup>

Sample size is calculated by following formula

$$N = \frac{Z^2 Pq}{d^2}$$

Where least proportion (Knowledge and awareness of Hepatitis B)  $p = 92$

With  $q = 1 - p$   $d = 5$  and Confidence level = 95% where  $n = 113$

##### Sampling Technique

Non-probability random sampling

##### Inclusion Criteria

- Final year students in Nishtar Medical University and Hospital Multan, Pakistan.
- Age range 18-25 years old males and females.
- Properly signed informed written consent.

##### Exclusion Criteria

- Medical students other than final year.
- Age in years <18 and > 25
- Evidence of chronic or inter-current acute medical disorder such as

€ Diabetes                      € Hypertension  
€ Ascites                        € HIV infection

##### Data Collection Procedure

Students fulfilling the inclusion criteria from Nishtar Medical University and Hospital Multan will be included in this study after permission from ethical committee and

research department. On inclusion criteria, informed written consent will be taken from each student ensuring confidentiality and fact that there is no risk involving the students while taking part in this study. Data will be collected for basic demographics (age and gender), vaccination status, screening tests of HBV, dosage-schedule of HB-vaccine and awareness about risks of HBV transmission.

### Data Analysis

All data entered using software SPSS version 18. Frequency and percentage will be used for gender, vaccination status, source of transmission (unsafe/illegal sex, I.V drug use, Blood transfusion), awareness of first aid treatment in case of accidental exposure to Hep.B virus, doses of vaccination and post exposure prophylaxis. Mean and standard deviation will be used for age and vaccination doses. Chi-square test will be applied to compare the efficacy between 2 groups. P-value will be considered significant if  $P \leq 0.05$ . Stratification of age, source of transmission, screening and vaccination status of final year medical students will be done to control the effect modifier.

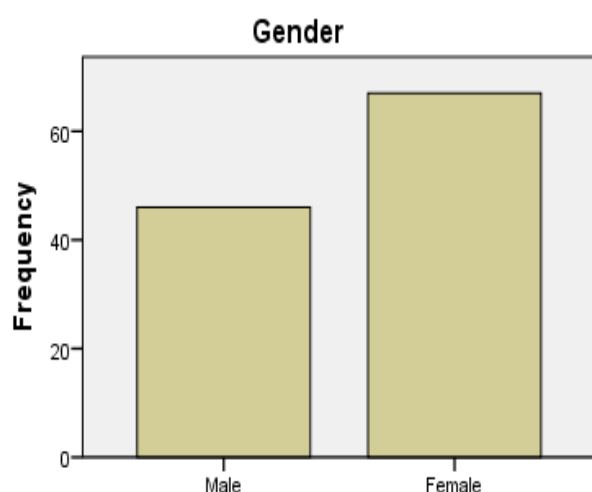
## RESULTS

The demographic characteristics of the study samples are shown in tables and figures, such as;

**Table 1: Gender.**

Male	46	40.7
Female	67	59.3
Total	113	100

A total of 113 medical students responded to the questionnaire, 67(59.3 %) females and 46(40.7%) males. All of the students were from Nishtar Hospital and Medical University Multan, Pakistan.

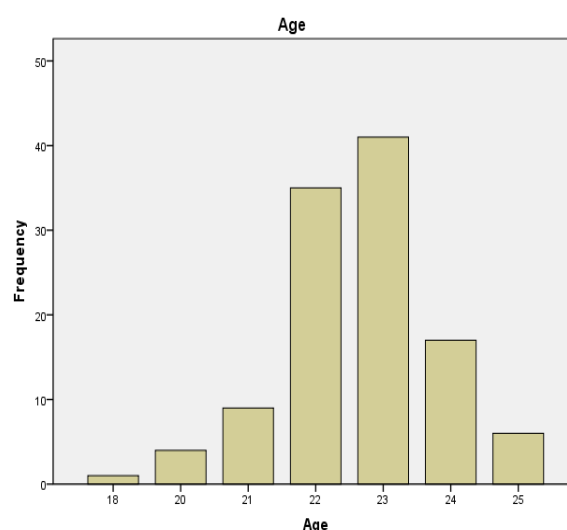


**Figure-1.**

The age of participants ranged from 18-25 years. All of the students were from Nishtar Hospital and University Multan. N=113.

**Table 2: Age of the medical students.**

Age Ranges	Frequency	Percent
18	1	0.9
20	4	3.5
21	9	8.0
22	35	31.0
23	41	36.3
24	17	15.0
25	6	5.3
Total	113	100.0

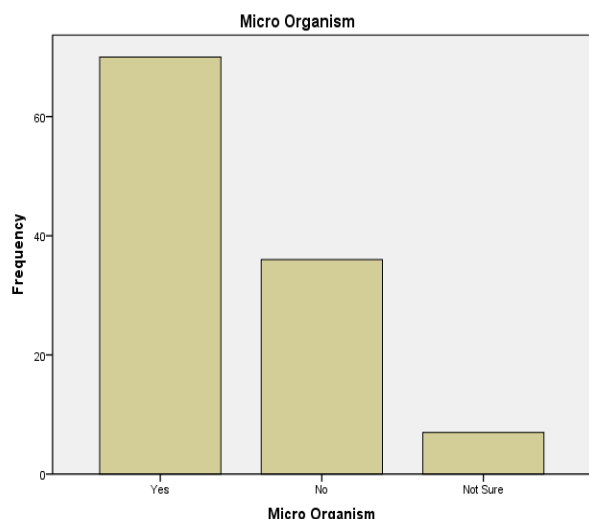


**Figure 2: Age stratification for the participating medical students.**

**Table 3: Causative agent.**

Causative agent	Frequency	Percent
Yes	70	61.9
No	36	31.9
Not Sure	7	6.2
Total	113	100.0

The study revealed the weakness of general knowledge about Hep.B among the 5<sup>th</sup> year medical students. As documented in table 3, The survey showed that, Out of 113 participants who completed the survey around 80(70.8%) were aware of Hep.B is viral infection caused by Hapedna virus. N=113



**Figure 3: Knowledge about the causative agent for HBV.**

**Table 4: HBV-Transmission Through Blood Transfusion.**

Through Blood Tr	Frequency	Percent
Yes	106	93.8
No	7	6.2
Total	113	100.0

**Table 5: HBV-transmission through I.V drug use.**

Through Iv-Drug use	Frequency	Percent
Yes	108	95.6
No	5	4.4
Total	113	100.0

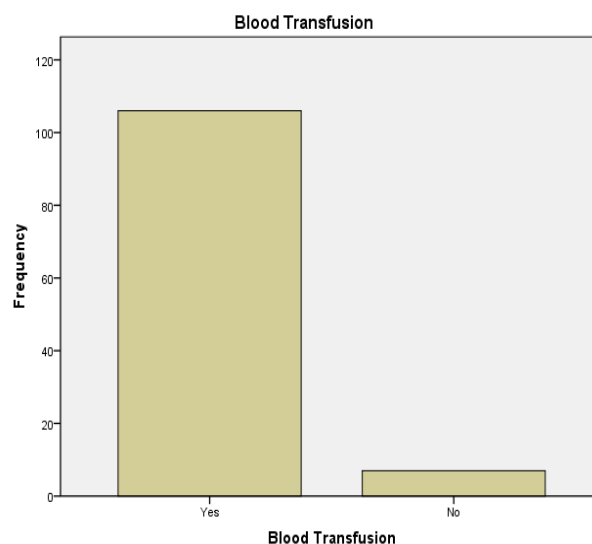
**Table 6: HBV-transmission through Unsafe/illegal sex.**

Through Unsafe sex	Frequency	Percent
Yes	110	97.3
No	3	2.7
Total	113	100.0

**Table 7: HBV-transmission through Used Shaving Blades.**

Through shaving blades	Frequency	Percent
Yes	104	92.0
No	9	8.0
Total	113	100.0

Majority 110(97.3%) knew that Hep. B transmission was possible through unsafe sex, while feeding the neonates 87(77%), i.v drug use 108(95.6%), Blood transfusion 106(93.8 %), Shaving with used blades 104(92%), and 41(36.3%) wrongly reported that Hepatitis B can be transmitted through sharing food utensils, while cough & sneeze 37(32.7%), hand shaking 11(9.7%). Blood transfusion was an important associated factor for Awareness regarding Hep.B infection ( $P=0.01$ )  $N=113$

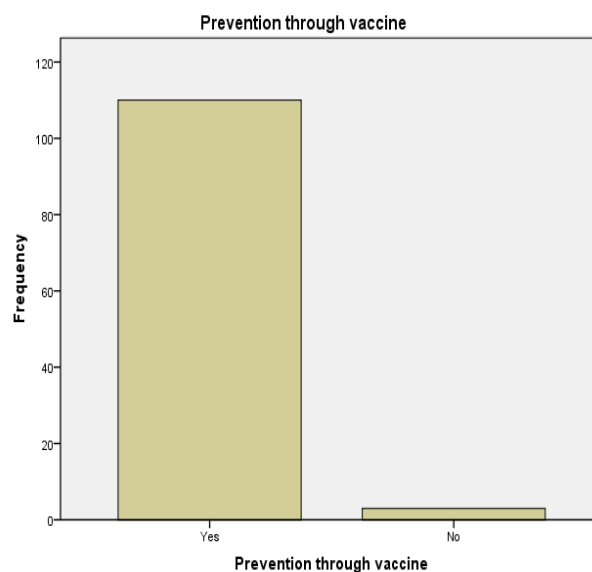


**Figure 4: Knowledge about transmission through blood transfusion.**

**Table 8: No of doses.**

Doses	Frequency	Percent
2	4	3.5
3	103	91.2
6	6	5.3
Total	113	100.0

In this study 103(91.2%) medical students correctly knew that no. of Hepatitis B vaccine doses were 3, while 4(3.5%), 6(5.3%) medical students wrongly reported that no. of doses were 2 and 6 respectively. Furthermore, 109 (96.5%) students knew that prevention was possible through vaccine.  $N=113$ .



**Figure 5: Knowledge about prevention through vaccination.**

**Table 9: Screening for HBV.**

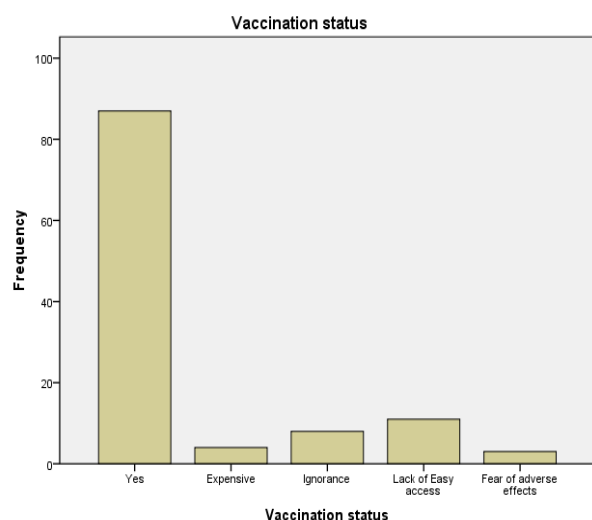
Screening	Frequency	Percent
Yes	90	79.6
No	21	18.6
Not Sure	2	1.8
Total	113	100.0

Regarding compliance with vaccination program 90 (79.6%) students had done their screening 21(18.6%) had not done their screening, and 96(85%) received vaccination of Hep.B while remaining 17(15%) had not received vaccination. N=113.

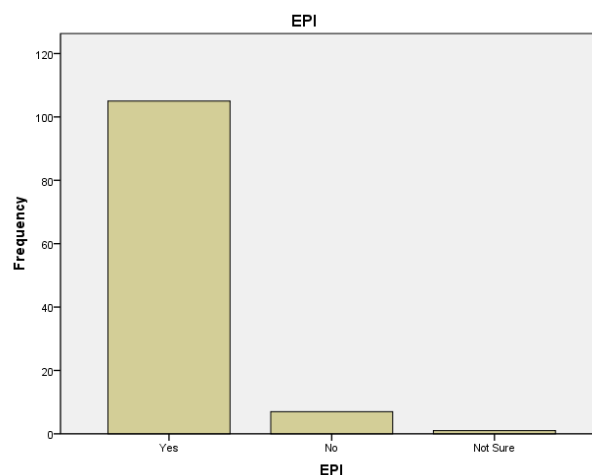
**Table 10: Vaccination status.**

HBV-vaccination	Frequency	Percent
Yes	87	77.0
Expensive	4	3.5
Ignorance	8	7.1
Lack of Easy access	11	9.7
Fear of adverse effects	3	2.7
Total	113	100.0

When asked for the reasons of not receiving of Hep.B vaccine, the answers varied between; Expensive 3(2.7%), Ignorance 6(5.3%), Lack of easy access 5(4.4%) Fear of adverse effects 3(2.7%).

**Figure 6: Vaccination status and reasons for not doing vaccination among the 5<sup>th</sup> year medical students.**

In this study, 105(92.9%) medical students knew that Hep. B was a part of EPI program while 90(79.6%) knew the 1<sup>st</sup> aid treatment of Hep B after accidental exposure. Analysis of knowledge with practice revealed that majority of the respondents had contracted Hep. B through blood transfusion (P=0.01), while for life long immunity (P=0.001) and screening (P=0.034).

**Figure 6: HB-vaccine as part of EPI program**

## DISCUSSION

The present study was conducted among 113 5<sup>th</sup> year medical students in tertiary health center in Multan city, Pakistan. Among the participants 67(59.3%) were females and 46(40.7 %) were males. Within the age group 18-25years, it was in concurrence with a study from Agartala city, India where 72.1% were females and within the age group 18-23 years (67.5%) with a mean age of 24.10(SD±7.011) ranging from 18-57 years.<sup>[17]</sup>

Females made up the majority of the respondents in the present study. It was also in concurrence with a study in Kuwait where majority of the respondents were participated from nurses and doctors,<sup>[18]</sup> The availability in the working place during working hours and greater number positioned in different wards in the hospitals might be the reason for more participation from this group compared to laboratory and technicians.

Majority 70.8% of them responded that Hep.B is a viral infection caused by Hapedna virus. A study from Sindh, Pakistan showed that 67.7% women correctly responded that virus was a cause of Hepatitis.<sup>[19]</sup>

We found that their majority knew that Hep.B transmission was possible through unsafe sex 110(97.3%), i.v-drug use 108 (95.6%), mother to child transmission 87(77%), shaving with used blades 104(92%) and blood transfusion 106(93.8%).

But a study from Agartala city, India showed that Hep.B transmission was possible through unsafe sex (69.3%), i.v drug use (75.4%) and from mother to child is 89.6%.<sup>[17]</sup> So the knowledge and awareness level we found in the present study was quite high. This could be due to fact that IEC activities carried by NGOs have contributed in this regard, over and above the public health sector activities.

Regarding the practices of Hep B, in this study population 79.6% students have done screening and 85% final year students have completed their vaccination.



There are several limitations in the present study, the cross sectional nature limits the determination of any causal relationship. Further investigation should include deduction of relevant markers (HBV-antibodies) to provide better evidence for sero-conversion in this population. Rates of accidental exposures and potential HBV risk should also be determined which might increase compliance among medical students who are not fully aware of their risk for the HBV exposure.

In conclusion, almost half of the study participants had medium to high knowledge levels of HBV and almost half of the participants were noncompliant with vaccination programs provided by Govt. of Punjab, Pakistan. Awareness programs and campaigns should be developed to increase the overall awareness and prevention of this disease in addition, we recommended the implementation of administrative policies which will guarantee that all students are covered by the vaccination programs. Further studies should be conducted to determine the real association between immunity level and vaccine compliance and whether, the current vaccination programs are, in fact, effective.

## REFERENCES

1. W. F. Carman and H. C. Thomas, "Genetic variation in hepatitis B virus," *Gastroenterology*, 1992; 102(2): 711–719.
2. US Public Health Service. Centers for Disease Control and Prevention. Updated U.S Public Health Service Guidelines for the Occupational Exposures of HBV, HCV, and HIV and recommendations for Post exposures Prophylaxis MMWR, 2001; 50: 1-52.
3. A. J. Zuckerman, "More than third of world's population has been infected with hepatitis B virus," *British Medical Journal*, 1999; 318: 71-92.
4. Z. Sun, L. Ming, X. Zhu, and J. Lu, "Prevention and control of hepatitis B in China," *Journal of Medical Virology*, 2002; 67(3): 447–450.
5. M. J. Alter, J. Ahtone, I. Weisfuse, K. Starko, T. D. Vacalis, and J. E. Maynard, "Hepatitis B virus transmission between heterosexuals," *The Journal of the American Medical Association*, 1986; 256(10): 1307–1310.
6. A. Pruss-Ustun, E. Rapiti, and Y. Hutin, "Estimation of the global burden of disease attributable to contaminated sharps injuries among health-care workers," *The American Journal of Industrial Medicine*, 2005; 48(6): 482–490.
7. Amin J, Yousuf H, Mumtaz A, Iqbal M, Ahmad R, Adhani SZ, et al. Prevalence of hepatitis B surface antigen and anti-hepatitis C virus. *Prof Med J*, 2004; 11: 334-7.
8. Mahmood MA, Khawar S, Anjum AH, Ahmed SM, Rafiq S, Nazir I, et al. Prevalence of hepatitis B, C and HIV infection in blood donors of multan region. *Ann King Edward Med Coll*, 2004; 10: 459-61.
9. J. L. Gerberding, "Incidence and prevalence of human immunodeficiency virus, hepatitis B virus, hepatitis C virus, and cytomegalovirus among health care personnel at risk for blood exposure: final report from a longitudinal study," *Journal of Infectious Diseases*, 1994; 170(6): 1410–1417.
10. B. J. McMahon, W. L. M. Alward, D. B. Hall et al., "Acute hepatitis B virus infection: relation of age to the clinical,"
11. K. Ikeda, S. Saitoh, Y. Suzuki et al., "Disease progression and hepatocellular carcinogenesis in patients with chronic viral hepatitis: a prospective observation of 2215 patients," *Journal of Hepatology*, 1998; 28(6): 930–938.
12. R. P. Beasley and L. Y. Hwang, "Overview of the epidemiology of hepatocellular carcinoma," in *Viral Hepatitis and Liver Disease: Proceedings of the International Symposium on Viral Hepatitis and Liver Disease: Contemporary Issues and Future Prospects*, F.B. Hollinger, S. M. Lemon, and H. S. Margolis, Eds., Williams & Wilkins, Baltimore, Md, USA, 1991; 532–535.
13. J. F. Perz, G. L. Armstrong, L. A. Farrington, Y. J. F. Hutin, and B. P. Bell, "The contributions of hepatitis B virus and hepatitis C virus infections to cirrhosis and primary liver cancer worldwide," *Journal of Hepatology*, 2006; 45(4): 529–538.
14. Communicable Disease Control Manual Chapter 2: immunization, Part 4- Biological products, 2018.
15. Hepatitis p; 332-336; Chapt. Liver, biliary tract and pancreatic disease, Kumar And Clarks' Clinical Medicine, 7<sup>th</sup> Edn.
16. Article in Hepatitis research And treatment November. Nazir Ibrahim Syrian Private University, 2014.
17. Dr. Taranga Reang, Department of Community Medicine, Agartala Government Medical College and Govinda Bhallabh Pant Hospital, Agartala, Tripura, India. Hepatitis B: Its awareness, practice and frequency of vaccination among selected high risk health care workers at tertiary care hospitals in Agartala city.
18. Soad AH, Ghadeer AA, Afaf EM, Ghizayel RA, Gamal M, Medhat KE. Knowledge, Attitude and behavior of health care workers regarding Hepatitis B infections in primary health care, Kuwait. *Greener J Med Sci.*, 2012; 2: 77-83.
19. Saad AR, Amer E, Humayun A, Imran Awareness and frequency of Hepatitis-B vaccination in high risk health care workers at a tertiary care hospital *Rawal Med J.*, 2013; 38: 3-6.