Original Article

SERO-PREVALANCE OF ANTI HBSAG AMONG FEMALE UNIVERSITY STUDENTS OF DISTRICT PESHAWAR

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Abstract

Background: Hepatitis B is a liver infection caused by hepatitis B virus (HBV). This infection can be acute or chronic. HBV infection can be prevented through immunization included in EPI in 2004 in Pakistan. Females are more unsafe and risky group for HBV infection having lots of chances for exposure to blood contact and female can transmit infection vertically to their children. Therefore immunization of females is very important.

Methods: The study was carried out among female university students of district Peshawar of age range 20 to 30. A written informed consent was taken from the head of departments of different universities of district Peshawar and from individual responder. Similarly about 200 questionnaires were filled from female University students of the defined age range. The information regarding the demography, HBV vaccination history and family history of HBV infection was gathered. About 3 to 5ml blood samples were collected from all HBV vaccinated and non vaccinated female students for determination of natural or vaccine induced immunity against hepatitis B surface antigen (HBs Ag). The collected blood samples were transferred to PHRC centre Khyber medical college for anti HBs Ag test. Data was gathered and analysed by SPSS version 22.

Results: This study consists of 200 female university students, among them 163(81.5%) were from urban and 37(18.5%) were from rural area. Out of 200 female students 45(22.5%) were none vaccinated and 131(65.5%) were vaccinated. Only 64(32%) have completed their vaccination course and only 79(60.3%) university students were having positive immunity against HBV (positive HBsAb). Results shows that 5(2.5%) university students have infected persons in their families, and only 2(40%) infected families were HBV vaccinated.

Conclusion: This study provided low HBV vaccination status and antibody sero-prevalence in spite of HBV vaccination. Schedule vaccination need full attention. HBsAb test should be done after every 5-10 years of HBV vaccination to ensure a booster dose vaccine.

Keywords: Sero-prevalance, Anti Hbs Ag, HBV vaccination, immunity, Immunization

Introduction

HBV is one of the major health problems nowadays. It is caused by virus of hepatitis B. It is one of the most life threatening infection higher risk of death. Hepatitis B effects more than 3 billion people in the whole world.(1) It can cause scarring of the organ, liver failure and cancer. It can be fatal if it is not treated. It is spread when people come in contact with the blood, open sores or body fluids of someone who has hepatitis B virus.(2) It can also cause chronic infection, thus due to cirrhosis and liver cancer a lot of people are at higher risk of death.(3) The hepatitis B virus was first discovered by Dr Baruch Blumberg in 1965. He won noble prize for his discovery. The virus was called the "Australia Antigen".(4) Vaccine therapy is used in various infectious diseases. Hepatitis B vaccine is made from parts of the hepatitis B virus. It cannot cause hepatitis B infection. The vaccine is

usually given as 3 or 4 doses over a 6-month period. Infants should get their first dose of hepatitis B vaccine at birth and will usually complete the series at 6 months of age. All children and adolescents younger than 19 years of age who have not yet gotten the vaccine should also be vaccinated. Hepatitis B vaccine is recommended for unvaccinated adults who are at risk for hepatitis B virus infection.(5) The first HBV vaccination was produced by the process of harvestation of hepatitis B surface antigen HBsAg from the plasma of HBsAg carriers.(6) Worldwide at least 2 billion people or one third of the world population have been infected with HBV, and 6% of the world population which is over 378 million people are chronic carriers of HBV and among them 620,000 people die each year from acute and chronic infection.(6-8) In addition to that 4.5 million HBV infection occur globally each year out of which a quarter

progress to infection of the liver. World Health Organization recommended in 1991 that all countries should introduce the universal hepatitis B vaccination policy by 1997 to prevent and control HBV infection.(9) Assessments of Hepatitis B immunization scope among social insurance specialists are expected to ascertain the extent defenseless to HBV disease. As per the WHO gauges, it differs from 18% in Africa to 77% in Australia and New Zealand. (10) In Japan, inoculation scope was observed to be 48.2% in dental workers.(11) In one investigation done in a tertiary care doctor's facility, in Delhi, 55.4% were apparently immunized against Hepatitis B.(12) The prevalence of HBV vaccination coverage in Pakistan was different in different cities that is in Lahore 8.06%, Larkana 4.8%, Karachi 4.5% and in Islamabad 4%.(13) The pattern of HBV vaccination in KPK is similar in other areas of Pakistan. Special preventive measures should be adopted against HBV infection. Our To determine HBV vaccination coverage rate among female university students. To determine immune status of female university students against HBV infection. To determine the effectiveness of HB vaccine.

Methodology

This was a cross-sectional descriptive type of study which was carried out at Pakistan Health Research Council (PHRC) Khyber Medical College Peshawar from January to July 2018. The study population was vaccinated and non vaccinated female university students. The sampling technique of the study was non-probability convenient sampling technique. Study was conducted among female University students who were willing to participate in the study, and was falling in the age limit of 20-30 years. Female University students having past history of HBV infection were excluded from the study. After taking written consent from the head of departments (HOD) of different Universities of Peshawar like Khyber College of Dentistry (KCD), Islamia College Peshawar (ICP) and NUML University Peshawar Campus, the trained staffs of PHRC were deputed to take data and blood samples. After taking informed written consent from responders a pre designed questionnaires was filled. The questionnaire include questions about demography, views about vaccination of the person, vaccination time period and family history about HBV infection etc. About 3 to 5ml blood samples were collected from all HBV vaccinated and non vaccinated female students for determination of natural or vaccine induced immunity against hepatitis B surface antigen (HBs Ag). The collected blood samples were transferred to PHRC centre Khyber medical college for anti HBs Ag test. Blood samples were centrifuged and serums were subjected for Qualitative anti HBs test using Abbon strips. Data was gathered and analysed by SPSS version 22.

Results

The total collected samples in this study were 200 female, out of them 131(65.5%) were HBV vaccinated,

45(22.5%) were non vaccinated and 24(12.0%) were not sure about their vaccination.(Figure 1). Among these studied samples 81.5% female students were belonging with urban area and 88.5% females were unmarried (Table 1). Study provided that 131(65.5%) students were HBV vaccinated, 45 (22.5%) were HBV non vaccinated and 24 (12%) were not sure about their HBV vaccination. Study also provided that 79 (60.3%) female HBV vaccinated students were non immune against HBs Ag inspite of vaccination and 3(6.66%) female non vaccinated students were naturally immuned against HBs Ag (Table 2). This study also provided that HBV vaccination is very important for the development of proper immunity and vaccination status provided a significant relation when compare with immune status. There was a significant difference in the immune status against HBs Ag of vaccinated and non vaccinated female student with significant p value $p=0.005$ (Table 3). Study provided that with increased dose of HBV vaccination, HBsAb antibody development was also high. For one, two and three dose Ab positivity were 3(8.6%), 9(33.3%) and for more than three doses 5(100%) respectively (Table 4). Result showed that 5(14%) of university students have HBV infected persons in their families and only 5(2.5%) students family members were HBV vaccinated (Table 5).

Figure 1. Percentage of vaccinated and non vaccinated female university students

Table 1. Demographic distribution of female university students of district Peshawar

S#	VARIABLES	FREQUENCY (%)
1	Age 20 to 24 years 25 to 28 years 29 and above	184(92) 12(6.5) 3(1.5)
2	Region Urban Rural	163(81.5) 37(18.5)
3	Marital status Married Un married	23(11.5) 177(88.5)
4	Education Undergraduate Graduate Post graduate	145(72.5) 44(22.0) 11(5.5)

Table 2. Sero-prevalence of HBsAb among female university students of district Peshawar

Sero-prevalence of HBsAb among female university students of district Peshawar				
S#	Vaccination status	HBsAb sero-prevalence		Total
		positive	Negative	
1	Vaccinated	52 39.6%	79 60.3%	131 100.0%
2	Non-vaccinated	3 6.66%	42 93.3%	45 100.0%
3	Don't remember	2 8.3%	22 91.6%	24 100.0%
Total		57 28.5%	143 71.5%	200 100.0%

Table 3. Effectiveness of HBV vaccination among female University students of district Peshawar

Effectiveness of HBV vaccination among female University students of district Peshawar				
Immunity	Vaccinated	Non-vaccinated	Don't remember	P value
Positive	52	3	2	0.005
Negative	79	42	22	
Total	131	45	24	

Table 4. Co-relation of vaccination dose with HBs antibody

Co-relation of vaccination dose with HBs antibody				
S#	No of vaccinated doses	HBsAb sero prevalence		Total
		Positive	Negative	
1	0	0 0.0%	69 100.0%	69 100.0%
2	One dose	3 8.6%	32 91.4%	35 100.0%
3	Two doses	9 33.3%	18 66.7%	27 100.0%
4	Three doses	64 100.0%	0 0.0%	64 100.0%
5	More than three doses	5 100.0%	0 0.0%	5 100.0%
Total		81 40.5%	119 59.5%	200 100.0%

Table 5. Vaccination coverage rate of HBV infected family

Vaccination coverage rate of HBV infected family			
S#	Family HBV vaccinated	Frequency of students with HBV infected family member	Percentage (%)
1	Yes	4	80
2	No	1	20
3	Don't remember	0	0
Total		5	100

Discussion

The study demonstrates the prevalence of HBV vaccination and its effectiveness. It was found in our study that among 200 Students 131(65.5%) females were vaccinated, 45(22.5%) were non vaccinated and 24(12.0%) don't know about their HBV vaccination. Our study was compared with the study coverage of Hepatitis B vaccine in medical students enrolled in a private Medical College of Mirpurkhas where, 214(57%) out of 375 students were vaccinated and 44.3% female were vaccinated.(14,15) The level of HBV vaccination mentioned are low than present study. The pattern of HBV vaccination among students are similar. It provided that more emphasis should be given to vaccinate all students. The schedule and vaccination dosage have not been taken serious in many cases. In a study conducted among medical students of Mirpurkhas out of 375 students complete vaccination was observed among 188(87.8%) students and 26(13%) were partially vaccinated.(16,17) In our study 64(32%) were completed their HBV vaccination dose and 31% were partially vaccinated. The rate of complete vaccination was found very low in present study, it may be the majority of responders belongs to middle class family due to lack of awareness among parents, majority of cases remain partially vaccinated.

In present study 28(14%) of university students have HBV infected persons in their families and only 12(42.857%) have with HBV Vaccination. Another study shows that 87.8% had an anti-HBs response of greater than 10 mIU/ml. There was a decrease in response rate and anti-HBs titre with age. The reaction rate for HEVAC B was 92.5% and GCC VAC 84.3%. The posterity had practically identical reaction to the life partners who were not blood relatives of the list transporters, but rather this could be identified with their more youthful age.(18) The present study shows that vaccination is important for proper development of immunity and vaccination status provided a significant correlation with immune status $p=0.005$. Another study was conducted among female medical students post vaccination in Hyderabad in India. The study provide that seroconversion rate (anti-HBs $\geq 10\text{mIU/mL}$) was 100% having a maximum co-relation between HBV vaccination and anti-HBs development. Both the study justified that HBV vaccination is very important for protection against HBV infection.(19,20) This study was restricted to only female university students of district Peshawar due to lack of time and budget. It would be more fruitful study if conducted among community or child bearing women. It was difficult to gather vaccination confirmation record of students in universities due to busy schedule of university students, lack of time, and less importance.. Despite of all these limitations and restrictions the study provided fruitful results.

Conclusion

This study provided low HBV vaccination status and antibody sero-prevalence in spite of HBV vaccination. A

very high rate 60.3% of HBV vaccinated girls did not develop immunity against HBV. Proper HBV vaccination, with accurate dosage, time of vaccination and maintenance should be ensured. HBs Ab test should be done after every 5-10 years of HBV vaccination to ensure a booster dose vaccine.

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Conflict of interest: None

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