

Original Article

Hepatitis B and C Prevalence and Prevention Awareness among Health Care Workers in a Tertiary Care Hospital

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Objective: To find the prevalence of Hepatitis B and C and to assess the current Hepatitis B vaccination status and knowledge of standard prophylaxis against blood borne infections in selected group of health care workers at Pakistan Institute of Medical Sciences (PIMS) Islamabad.

Study Settings: Descriptive cross sectional prospective study.

Place and Duration: Between 15th June 2009--30th June 2009.

Infection Control Committee in collaboration with Microbiology Department, Pakistan Institute of Medical Sciences Islamabad.

Materials and Methods: Three hundred eighty three health workers comprising of nurses and Lab workers were interviewed after taking verbal consent using a self administered questionnaire. Data was analyzed using SPSS version 13.

Results: Among the 383 HCWs interviewed nurses were 72% (277) and Lab workers were 27.5 % (106) .There age ranged from 17-59 years with mean age of 34.38 years. 41% of health care workers had service length between 1-5 years. 57.6 % (221) were completely vaccinated, 18.3 % (70) partially vaccinated and 24 % (92) were not vaccinated at all. Awareness and attitude problem was identified as the main factor responsible for lack of vaccination. 53.5% (206) had been exposed to needle stick injury at least 1-5 times in their whole professional life. 48.1% (99) of the needle stick injury exposed personnel were aware of post exposure prophylaxis whereas 51.9 % (107) of them were ignorant of standard prophylaxis.

Most of the individuals knew their Hepatitis B and C status i.e. 93.7% (359) while 6.3 % (24) had never got themselves tested for hepatitis B& C. Hepatitis B positive were 0.5 % (2), while 1.6 % (6) were Hepatitis C positive among 359 HCWs.

Conclusion: Percentage of HCWs vaccinated was low and the main factor responsible was awareness and attitude problem. At the same time non- availability of vaccine by the employer had been identified as the second most important reason for non vaccination.

Half of the studied group was not aware of the precise post exposure prophylaxis .The prevalence of Hepatitis B and C was low in this high risk group as compared to general population of the area.

Key words Hepatitis B vaccination, HCW, needle stick injury

Introduction

Health care workers (HCWs) are at high risk of encountering needle stick injuries, blood and body fluid exposure and therefore acquiring blood borne

infections especially Hepatitis B & C, which may be followed by serious long term sequelae in a significant number of cases. Estimated reported incidence of injuries in hospital Health care workers is approximately 30/100 bed /yr.¹

Global burden of Hepatitis B Virus (HBV) due to contaminated sharp injuries in HCWs is estimated to be 66000 cases and 261 deaths annually. In developing countries 40-60% HBV infections in HCWs are attributed to sharp injuries.² There are two billion people worldwide who have been exposed to Hepatitis B virus, of these more than 350 million are chronically infected with this virus.³ In Pakistan Hospital based serological testing has revealed that 48% of patients with Chronic liver disease (CLD)⁴ and up to 66%

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patients with Hepatocellular carcinoma (HCC)⁵ were positive for HBsAg. The carrier rate of HBsAg is from 2.8% -10% with variation in different groups in different areas of Pakistan.^{6, 7, 8} Pakistan has been categorized as having intermediate endemicity of HBV with 2-7 % HBsAg prevalence in general population.³

The Risk of acquiring Blood borne infections from occupation exposures is dependent on concentration of infectious viron in body fluids, volume of infected material transferred and frequency of exposure. The risk is about 2% if the source is Hepatitis B “e” antigen negative and increases to as high as 40% if the source is Hepatitis B “e” antigen positive.⁹

Hepatitis B is a vaccine preventable disease for which a safe, immunogenic and effective vaccine is recommended since 1982¹⁰ though its implementation is still insufficient and a sizable proportion of HCWs never get vaccinated despite potential occupational risk,¹⁰

In an unvaccinated person, risk of HBV infection from a single needle stick injury from HBV infected blood ranges from 6-30%.¹¹

Hepatitis C is another blood borne infection which is a major cause of human morbidity and mortality. There are about 170 million persons having Hepatitis C infection in the World.¹² HCV is implicated in 64% cases of hepatic Cirrhosis¹³ and 75 % Hepatocellular Carcinoma.¹⁴ It is the single most common reason for liver transplantation in the world over.¹⁵ HCV prevalence is highest in Egypt (15-20%)¹⁶ and lowest in UK having (0.01-0.1%).

True prevalence in Pakistan is not known but average estimated seroprevalence depicted in few representative studies show that there is a seroprevalence of 6% in Pakistan and estimated 10 million subjects are infected with HCV in Pakistan.¹⁷ Its vaccination is not available therefore prevention is the sole method to avoid disease contraction.

There are very few studies in Pakistan on prevalence rate of Hepatitis viruses in HCWs, hepatitis B vaccination status, awareness and attitude towards basic infection control practices like post exposure prophylaxis to needle stick injuries etc. If effective infection control programme is to be implemented in a health care setting base line data on these matters helps to establish the right direction for its implementation, as prevalence of disease attitude and behavior of HCWs vary from place to place.

Hence the study was designed to look into the situation with the hope that findings will help the infection control committee in formulating the policies at Pakistan Institute of Medical Sciences (PIMS) Islamabad.

Materials and Methods

An interview based precoded and pretested questionnaire was used. Interviewers were trained and their performance was perfected by repeated practice among themselves which was monitored by the senior member of the committee.

Questions were carefully designed to meet the objectives of the study. Main component of the Performa being, designation, service length, Hepatitis B vaccination status, reason for non vaccination, needle stick injuries history, and awareness of post exposure prophylaxis, finally viral hepatitis status and duration of positivity.

Reasons for non vaccination were assessed by asking leading Questions about awareness, availability and affordability. 383 Health Care workers comprising of 277 nurses and 106 Lab workers, were interviewed by convenience sampling after taking their informed consent and promising confidentiality. Doubtful entries and workers found positive for Hepatitis were rechecked by repeating their interviews. Statistical analysis was done using SPSS version 13.

Results

Total 383 Healthcare workers were interviewed among which 72.32% (277) were nurses and 27.68% (106) were laboratory workers. Pathologists were least in number 1.3%, while staff nurses comprised major portion of group, (63.9%) There ages ranged from 17-59 years with mean age of 34.38 years.

41% of health care workers had service length between 1-5 years.

26% of healthcare workers were males while 74% were females.

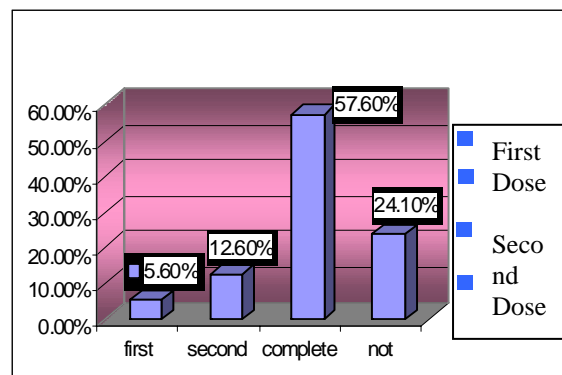


Figure: 1 Vaccination Status of Study Group (n=383)

Vaccination status of the study group was not very satisfactory, as only slightly more than half were

completely vaccinated (57.6%). While almost one fourth were either not vaccinated (24%) or only partially vaccinated (18.3%) (Figure: I)

Pathologists although comprising the smallest proportion of study group had maximum vaccination coverage, (83%), residents being second to them in vaccination coverage (72%), while least vaccinated subgroup was that of laboratory attendants. (Figure: II)

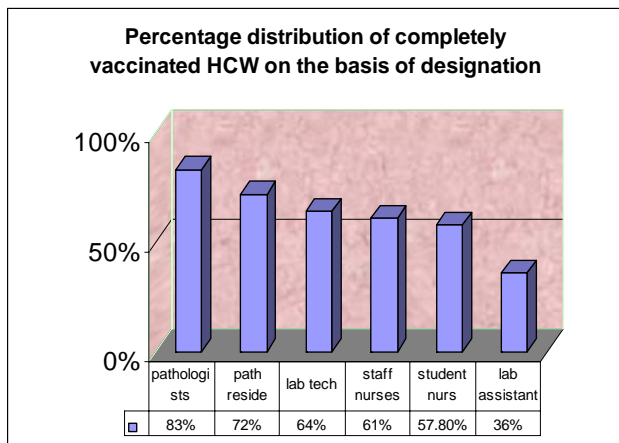


Figure II : Percentage Distributions of Completely Vaccinated HCW on the basis of Designation {n=220}

Employer was responsible for vaccination of majority of study group workers i.e. 72% (206/290), only few of them got vaccinated on their own expense 27% (80/290). (Figure: III)

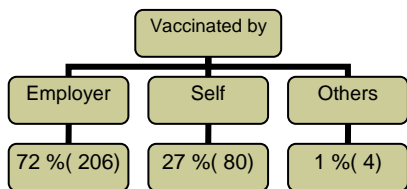


Figure III : Source of Vaccine in both Complete and Incompletely Vaccinated HCWs (n=290)

Very interestingly the ones who got vaccinated on their own showed better compliance in completion of course (70/80) and less drop outs (10/80) 12%, as compared to employer based vaccination which showed (60/206) 29% drop out. (Table: I and II)

While non availability was the second most important reason for non vaccination. (Table: III)

53.5% (206) gave history of exposure to needle stick injury at least 1-5 times in their whole professional life. (Figure: IV)

Table I: No of Doses of Hepatitis B Vaccination Taken and Relationship to Source of Vaccination

No of doses of Hepatitis B vaccination taken	Hepatitis B vaccination source			
	Employer	Self	Others	Total
First	18	4	0	22
Second	42	6	0	48
Third	146	70	4	220
Total	206	80	4	290

Table II: Complete Vaccination Status and Relationship to Vaccination Source (n=220)

Source of vaccination	Complete vaccination attained N (%)
Employer based vaccination	146/206 (70.87%)
Self vaccination	70/80 (87.5%)
Others	4/4 (100%)

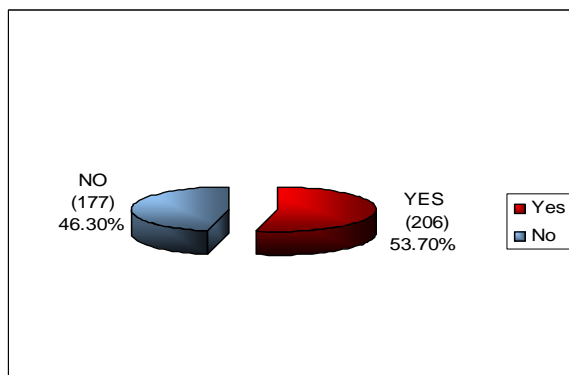


Figure IV : Exposure to Needle Stick Injury (NSI) (n=383)

Awareness of post exposure prophylaxis of the needle stick injury was in 48.1% (99) personnel whereas 51.9

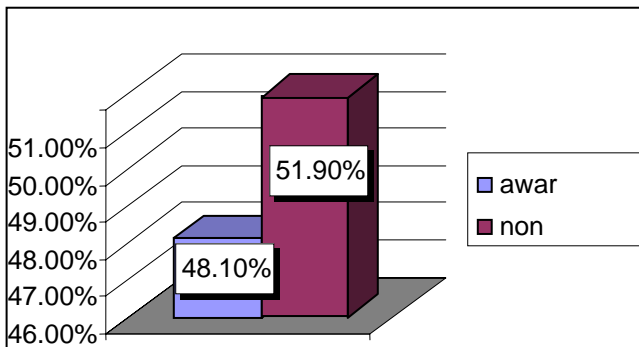
%(107) of them were ignorant of standard prophylaxis. (Figure: V)

Table III: Reasons for Hepatitis B Non Vaccination (n= 93)

Reasons	No. (%age)
Non availability	26 (28.0)
Non affordability	2 (2.1)
Non awareness/ attitude	39 (41.9)
All of the above	12 (12.9)
Combination of any two	14 (15.0)

Major reason identified for non vaccination was, non awareness/attitude.

Figure V :Awareness of Post Exposure Prophylaxis to NSI in HCWs



The study group was well screened .Most of the individuals knew their Hepatitis B and C status i.e. 93.7% (359) while 6.3% (24) had never got themselves tested for Hepatitis B & C. Positivity for Hepatitis B was 0.50% and 1.6% for Hepatitis C. (Figure: VI)

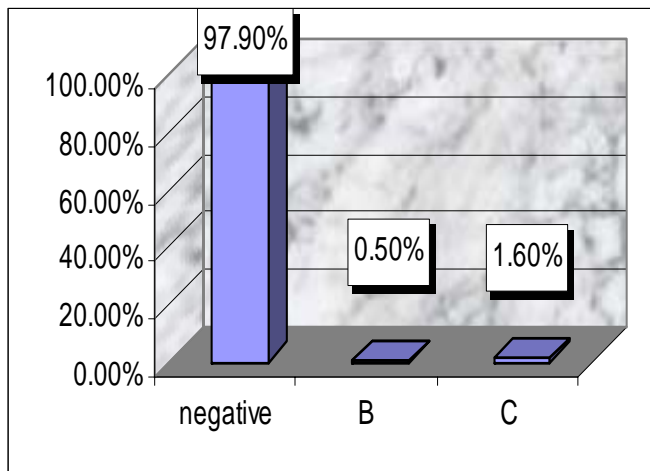


Figure VI: Percentage of Hepatitis B & C Positive HCWs.

All the individuals who were Hepatitis B & C positive had a definite history of needle stick injury except one who had history of surgery. (Table: 4)

Table: IV Exposures to Needle Stick Injury & Status Of Hepatitis B and C

Total HCWs 383	H/O needle stick injury	No H/O needle stick injury
Hepatitis B positive (2)	2	-
Hepatitis C positive(6)	5	1* (H/o surgery)
Negative Cases 375	198	177
383	205	178

Discussion

In this study it was observed that completely vaccinated health care workers were 57.6%, un vaccinated 24.1%, where as 18.2% started the vaccination but did not complete it. This dropout could be attributed to awareness and attitude as those who had self financed vaccination had less drop out due to their committed behavior, while many individuals who probably were not very convinced to get vaccinated got initially vaccinated by employer but did not give it much importance and hence did not complete their three doses course. In our study 72% workers were provided the vaccine by the employer but only 71% out of these completed their three doses, while 27% got themselves vaccinated on their own initiative and expense and 87.5% of this group achieved complete vaccination, showing that self vaccinated group was more motivated and aware of need and benefit of the vaccination.

Vaccination status of present study group was comparable to other studies done in different hospitals of Pakistan. In a study done in 2007 in Ayub medical college Abbotabad it was 48% 18 and 49 % in Allama Iqbal medical college HCWs and medical students by Nasir et al.¹⁹ Recent Study from tertiary care hospital of India also had similar findings as in our group, who showed that 55.4% of 2162 HCWs screened had been vaccinated and 27.7% had never been vaccinated.²⁰ these figures are lower than those reported by Younis et al (71.8%)²¹ and Ali et al (86%)²² ; more or less Similar findings have been reported from USA (73 – 83%) 23 and in Saudi Arabia 85%.²⁴

In our study Group the most covered for vaccination were Pathologists (83.5%) while no

difference was found among laboratory technicians (64%), staff nurses (61%) and student nurses (58%) it is comparable and consistent with study at Aga Khan University Hospital.²² and study at Lahore.²¹ Lowest vaccinated subgroup in our study was that of laboratory assistants i.e. 36%. Study at Aga Khan Hospital²² and Fatima Jinnah medical college Lahore²⁴ and study in USA²³ are consistent with our study findings both for percentage of sub groups of HCWs vaccinated and also for reason for non vaccination. Study by Nasir et al identified among health care workers the high cost of vaccination, while the most often cited reason (33.7%) among medical student was the belief that they were not at risk. This belief was also prevalent among nurses (36.4%), laboratory workers (38.6%) and paramedics (33.2%).¹⁹

Analyzing the reasons for non vaccination in our study group, non awareness and attitude was found to be the single most common factor (41.9%) followed by non availability/non affordability (28%), showing thereby that ensuring the availability of vaccine alone will not translate into success. Awareness and attitude problem towards the need for vaccination has to be addressed at the same time.

In a group of 383 HCWs, 53.7% gave history of NSI and 51.9% of them were found to be unaware of standard post exposure prophylaxis (PEP). Study at Karachi reported an incidence of 41%²⁰. This is in sharp contrast to a study reported from India where 80.1% gave a history of NSI during the preceding one year.²⁷ Under reporting by our HCWs could be the reason as they did not register the episodes not considering them important enough, again pointing towards their attitude and perception.

In our HCWs only 2(0.55 %) were Hepatitis B positive and 6 (1.6%) were Hepatitis C positive. Both Hepatitis B positive workers had a history of NSI relating to seroconversion. Amongst six Hepatitis C positive workers, five gave history of NSI and sixth one had no NSI history but attributed it to a surgery he underwent in the recent past.

Pakistan has been categorized as having intermediate endemicity of HBV with 2-7 % HBsAg prevalence in general population³ and average estimated seroprevalence of 6% of HCV.¹⁷ HCWs fall into high risk group but the prevalence of the disease in our study population is much low in spite of the fact that this group was inadequately vaccinated due to non awareness and indifferent attitude towards vaccination benefits and PEP. Probably as it was a question based data and voluntary nature of self reporting by HCW and not based on seroprevalence was a limiting factor to the study, this element influencing the results can not be ruled out. In our group 6.3% did not know their status also. Moreover other contributing factor could be short length of service as major number of workers had

service length between 1-5 years .In spite of all this the exact reason for low positivity cannot be explained fully. Studies on prevalence rates of Hepatitis B and C in Pakistan in health care workers have shown higher prevalence than our study. At Civil Hospital Karachi in 2002 prevalence of 2.4% Hepatitis B and 5-6% Hepatitis C was reported²⁵, in a study at Armed Forces Institute of Pathology Rawalpindi in the year 2000 Hepatitis B was 7.7%.²⁶ In Abbot Abad overall 8.0% prevalence of HBV, HCV and hepatitis B+C mixed infection in health care workers was reported.²¹ A study of HCWs of India screened by serological markers of HBV including HBV-DNA for surface and core region by nested PCR in HBsAg negative and Ig G anti hepatitis core antigen positive subjects showed 1% positivity for hepatitis B.²⁵ A statistical study of 10,654 HCWs in Scotland in 2001 indicated an overall rate of HCV infection of 0 .28% (30/10,654) with sub group rates of 1.4% for surgeons and 1% for physicians.²⁷

In our study group it would be advisable to conduct a study based on serum testing so as to find out more exact prevalence of these two diseases.

Conclusion

There is need to educate our HCWs through a well organized infection control programme , spreading awareness and education of infection control measures ,diseases transmissions ,post exposure prophylaxis and on benefits of vaccines and other preventive ways so that a change in attitude can be successfully achieved. This should be then ensured by making continuous availability of vaccine by the health institution by bearing the cost for vaccinating and organizing vaccination programme to achieve 100% coverage with administrative support as multidisciplinary approach is required.

Another effective way worth following is that vaccination of health care workers, medical and paramedical students can be made mandatory at the time of entry in service or studies.

Proper NSI or blood and body fluid exposure reporting, documentation ,post exposure prophylaxis and then data analysis programme should be put in place for better out comes.

Prevalence of hepatitis B and C in our HCWs can be found out more precisely by conducting studies based on relevant laboratory tests.

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