Original Article

Knowledge of HBV Risks and Hepatitis B Vaccination Status Among Health Care Workers at Khartoum and Omdurman Teaching Hospitals of Khartoum State in Sudan.

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Abstract:
HBV infection is notorious and is endemic in Sudan. Health care workers are at particular increased risk for the infection. Their knowledge and acceptance of vaccination against the virus is of at most importance for the control of the disease.
Objective: To study the knowledge and vaccination status among health care workers in some central hospitals in Sudan.
Methodology: Data from different categories of health workers were collected using structure questionnaire after taking informed consent. Data were analyzed using Chi-Square and T-Test.
Results: Around 96.22% of surgeons knew their increased risk for infection, and 71.69% of them knew vaccine prevention. The overall screening for the virus was 32.2%. Only 26.19% of those who received the vaccination had completed the doses. None vaccination due to a none specified cause was the main reason among doctors and nurses. Knowledge about risk and vaccination was very low among cleaning staff and none of them had vaccination.
Conclusion: Although knowledge about HBV risk in our health care workers was reasonable –apart from cleaning staff-, the vaccination among them was not satisfactory. Efforts have to be augmented and special care for cleaning staff is mandatory.

Keywords: HBV Infection, Cirrhosis, Hepatocellular carcinoma.

HBV infection is responsible for approximately one third of all cases of cirrhosis, half of all cases of hepatocellular carcinoma, and is estimated to be responsible for a large number of deaths each year[1-3]. It is transmitted by percutaneous or mucosal exposure to infected blood or other body fluids and by other routes. Health-care-related transmission has long been recognized as an important source of new HBV infections worldwide[4].

Despite the large population of infected persons, efforts to prevent and control HBV have been very successful with the introduction of hepatitis B vaccines. First licensed in the United States in 1981, hepatitis B vaccine is now one of the most widely used vaccines in the world, and is part of the routine vaccination schedule for many of the world's infants and children including Sudan[5].

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Adults at high risk for HBV infection like health care workers (HCWs) should also receive the vaccine[6].

All currently licensed hepatitis B vaccines are given intramuscularly, in the thigh or the deltoid muscle. The vaccine is generally administered in three doses [7-11].

Ninety percent of healthy adults and 95 percent of infants, children, and adolescents have protective serum anti-HBs antibody levels after the vaccine series has been completed[12].

Both the currently licensed vaccines and the previous plasma-derived vaccine have been demonstrated to be safe. Hence knowledge of HBV infection, and the awareness of HCWs about the importance of HBV vaccination and its real implementation, remains to be very important issues. In countries where large-scale vaccination efforts were made in the first decade after introduction of the vaccine, the epidemiology of hepatitis B and HBV infection has changed, and there are early signs that the burden of HBV-related sequel

will be significantly reduced, including liver cirrhosis, hepatocellular carcinoma, and death related to HBV[13].

Objectives

This study was carried out to assess the HBV vaccination status and knowledge about vaccination among HCWs in Khartoum and Omdurman Teaching Hospitals in Sudan, and to determine the reasons behind health care personnel being non-vaccinated.

Materials and Methods

This was a cross-sectional descriptive interview and hospital-based study. The study was conducted at the Khartoum and Omdurman Teaching Hospitals, Khartoum State- Sudan.

The study population included healthcare workers who were working in the medical service during the time of the study. All levels of healthcare workers were included in the study - doctors, nurses, theatre anesthesia technicians (TAT), laboratory technicians (lab. tech) and cleaning staff. The method used for sampling was Convenience Sampling. We used the formula Thumb Rule B =1.96 pq/n. Sample size was calculated to be 346 persons.

A structured anonymous questionnaire containing the biomedical data, type of employment, knowledge about the risk and prevention of HBV, screening status for hepatitis B, HBV vaccination status and reasons for non-vaccination was prepared and health care workers were interviewed, after taking informed consent. Confidentiality of all data collected was ensured. Selection of the workers was random from different departments.

The data collected were then processed and analyzed using Chi-Square and T-Test. Ethical clearance from the hospitals authorities was obtained. Our study had its limitations that it relied on information given by participants.

Results: Out of 346 who were included in the study 135 [39.02%] were males. 69 were medical doctors, 53 surgeons, 75 nurses, 47 TAT, 62 lab. tech and 40 were cleaning staff. The study population minimum age in years was 19; maximum was 60, with a mean± standard deviation [SD] of 31.41± 8.282, while the duration of employment in health serves in years varied with a minimum of 0.08, a maximum of 35, a mean ± SD of 6.1747± 7.315.

Risk awareness is significantly higher among doctors and lower among cleaning staff (p=00) while knowledge about prevention is significantly higher among doctors and theatre assistant technicians and lower among cleaning staff (p=00) (Figure 1& Figure2)

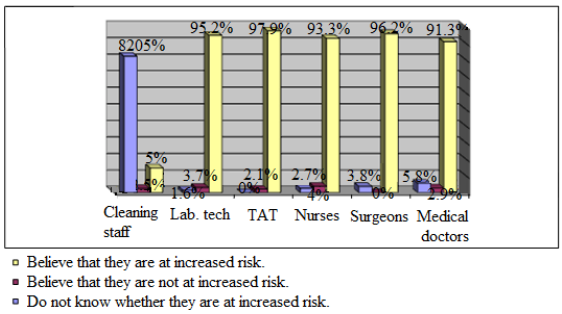

Figure 1: Risk awareness among different groups.

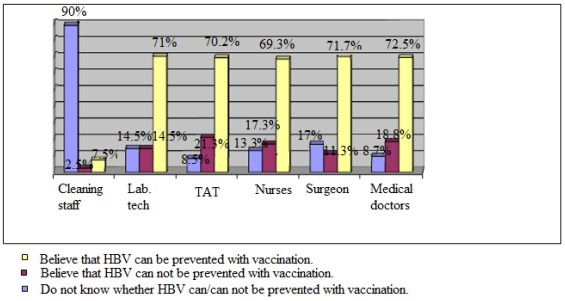

Figure2: Knowledge about HBV prevention.

The total number of HCWs who had screening was 111(32.01%). This comprises the majority [56.45%] of lab technicians. However, most of the medical doctors [78.26%], surgeons [66.04%], TAT [51.06%], and nurses [26.67%] were not screened. All [100%] of the cleaning staff were not screened. Out of the screened group only four (3.6%) were found to be positive for HBV (two surgeons, one nurse and one TAT).

Majority of surgeons [62.26%] and TAT [59.57%] reported partial or complete vaccination for HBV. This did not hold true for the medical doctors [47.83%], nurses [40%], and lab technicians [29.03%].

Table1. Age group, Gender, Occupation and Reasons for non-vaccination

Occupation	Age group	High cost		Lack of knowledge		Fear of side effects		Non specific	
		Male	Female	Male	Female	Male	Female	Male	Female
Medical doctor	<= 20	0	0	0	0	0	0	0	0
	21 - 30	2	3	0	0	0	1	6	13
	31 - 40	4	1	0	0	0	0	3	2
	41 - 50	0	0	0	0	0	0	0	0
	51 - 60	0	0	0	0	0	0	0	0
Total		6	4	0	0	0	1	9	15
Surgical doctor	<= 20	0	0	0	0	0	0	0	0
	21 - 30	1	0	1	0	0	0	3	4
	31 - 40	3	1	1	0	0	0	4	1
	41 - 50	0	0	0	0	0	0	0	0
	51 - 60	0	0	0	0	0	0	0	0
Total		4	1	2	0	0	0	7	5
Nurse	<= 20	0	0	0	1	0	0	0	0
	21 - 30	0	6	1	3	0	5	5	13
	31 - 40	1	1	0	1	0	1	2	3
	41 - 50	0	0	0	0	0	0	0	2
	51 - 60	0	0	0	0	0	0	0	0
Total		1	7	1	5	0	6	7	18
Th.asst.tech	<= 20	0	0	0	0	0	0	0	0
	21 - 30	0	0	1	0	0	0	1	0
	31 - 40	0	0	1	0	0	0	4	2
	41 - 50	2	1	2	0	0	0	2	1
	51 - 60	1	0	0	0	0	0	0	0
Total		3	1	4	0	0	0	7	3
Lab technician	<= 20	0	0	0	0	0	0	0	1
	21 - 30	2	2	0	0	3	15	3	10
	31 - 40	0	1	0	0	2	1	1	0
	41 - 50	0	0	0	0	1	0	1	1
	51 - 60	0	0	0	0	0	0	0	0
Total		2	3	0	0	6	16	5	12
Cleaning staff	<= 20	0	0	0	1	0	0	0	0
	21 - 30	0	0	4	1	0	0	0	0
	31 - 40	0	1	1	14	0	0	0	2
	41 - 50	0	0	0	8	0	0	0	2
	51 - 60	0	0	0	6	0	0	0	0
Total		0	1	5	30	0	0	0	4

On the other hand all [100%] of the cleaning staff had neither partial nor complete vaccination.

Complete vaccination was achieved by TATs (44.68%), surgical doctors (41.5%), and medical doctors (36.23%). Nurses (20%), and lab technicians (14.5%), were less vaccinated but none of the cleaning staff (0%)

A minority of surgeons [18.87 %], medical doctors [13.04%], TAT [14.89%], lab technicians [12.9%], and nurses [20%] reported partial vaccination for HBV.

The overall vaccination coverage (complete and partial) was 41.0% (those who completed three doses were only 26.19%, 13.94% were partially vaccinated and 0.86% didn't know their actual dose status.) none vaccinated were 51.5%, and 7.5% didn't know their vaccination status.

There is a significant relation between gender and vaccination status (p=0.014) in such a way that females were likely to be vaccinated compared with males, 27% and 25.18% respectively. It seems that the site of the work has a role in vaccination state as a significant difference was noted between the two hospitals KTH and OMTH, where the complete vaccination coverage was found to be 27.6% and 17.4% respectively. (p =.001).

On average the duration of employment was higher among the vaccinated group (mean± SD =6.9 ± 8.15) compared with non-vaccinated group (mean =5.16 ± 6.3), (p=0.037). On the other hand no significant difference was noted between age and vaccination status (31.1±7.96 vs 30.5±7.59, p=0.49).

Main reasons for non-vaccination were due to a nonspecific cause among female doctors and nurse (21-30 years), due to fearing of side effects among female lab technicians (21-30 years) and due to lack of knowledge among the female cleaning staff (31-40 years) (Table1).

Discussion:

Around 96.22% of surgeons knew their increased risk, and 71.69% of them knew vaccine prevention. The close contact with wounds and blood beside health education might explain this relatively high alert about the infection and vaccination among them. Our findings are quite similar to reports from Pakistan[14].

Despite the fact that they were at increased risk because of handling of blood and blood soaked material in their daily activity, cleaning staff knew very little about HBV, their increased risk of acquiring the infection, the vaccination, and none of them were ever screened. This could likely be caused by ignorance and lack of access to screening in the cleaning staff. These results were very alarming and they did raise red flags about the seriousness of the matter.

In this study, 32.01% HCWs reported screening for HBV. This is very low when compared with that reported in Italy[15], but is quite similar to that in Pakistan[14]. Social and legal fear of being detected as positive for HBV may play a role in this low figure among our HCWs. However, carelessness should not be ignored as a contributory factor.

Among different occupational categories, lab technicians were found to report screening for HBV with highest percentage. This may be attributed to the easy accessibility to the test for lab technicians, and awareness of being at potentially increased risk of HBV infection.

Those who were found to be positive for HBV in our study were 3.6%. Although this figure is lower than the 6.8% and 26% seroprevalence ranges of HBV that were reported in central and southern Sudan respectively, it still holds a great concern as this group carries a higher risk of transmitting the infection to the population. The small number of those who had screening for HBV from the overall sample of our study was probably behind these differences, and may also explain the lower rate when compared to the 15.1% found in Italy[15].

Out of those who were vaccinated, the ones who completed three or more doses were only 26.19%. This strikingly low figure - compared to the universal vaccination coverage levels[14-16] - despite availability of a highly effective vaccine is alarming. Failure to complete the doses and the lack of awareness of the dose status reflects

negligence or carelessness of the staff. Young females (21-30 years) were the most age group who reported complete vaccination in all HCWs. In general our female HCWs were significantly vaccinated more than males (p=0.014). This was similar to what was found in Italy[15]. This could be explained by the fact that, females were unwilling to be a potential transmitter of HBV to their future offspring; hence they were keener to be vaccinated.

HCWs that spent seven years or more were likely to have received one or more doses of the vaccine. This may indicate that our health system is more or less useful; as probably at least some HCWs learned and achieved vaccinating themselves while they were working in these hospitals.

In this study it is clear that the vaccination status (complete) was affected by the occupational category probably reflecting the wide variations in knowledge regarding HBV infection and vaccination as TATs (44.68%), surgical doctors (41.5%), and medical doctors (36.23%), had achieved the highest levels while none of the cleaning staff (0%) were reported to have been vaccinated. Compared to other similar studies we had very low vaccination coverage here in Sudan especially among cleaning staff. This lags far behind the 45% found among the cleaning staff in inner London in 1994[17].

Vaccination coverage levels were found to be significantly higher in Khartoum teaching hospital 27.6% than in Omdurman teaching hospital 17.4%. There is no specific policy for vaccination in either hospital and the reason for this difference remains unknown.

Denying a specified cause for being not vaccinated was the main reason among doctors (medical and surgical), and nurses. The previous result was similar to what was found in Italy, where 72% were not vaccinated due to a nonspecific cause[14]. Surprisingly 15 doctors claim that high prize of the vaccine was behind being not vaccinated! (Table 1). On the other hand, fear of side effects was the main reason among lab technicians. A number of independent scientific bodies have not found evidence to support these concerns and have concluded that hepatitis B vaccine is both safe and effective[18-25].

Conclusion:

In this study it is clear that the overall awareness of increased risk of HBV and knowledge about prevention among our HCWs was low particularly among cleaning staff. This was probably due to lack of appropriate educational programs regarding HBV and its modes of transmission, infection and the way of prevention as well as the unavailability of the vaccine in the past. The picture is better in some categories with a very significant difference between occupational categories.

Implementing extensive educational programs about HBV risks and vaccinations are mandatory.

At present it has become a constant policy for most of our universities to vaccinate their students who were going to work in the medical field. Whether or not to introduce and apply more vaccination laws for HCWs is a real focus of concern, since low vaccination coverage contributes highly to the spread of hepatitis B to HCWs, their patients, and their families resulting in a high prevalence of HBV in the community which has significant social and economic burden.

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