Low coverage of hepatitis B vaccine and determinants among health professionals working in Amhara regional state hospitals, Ethiopia

Berhanu Elfu Feleke
Department of Epidemiology and Biostatistics, University of Bahir Dar, Ethiopia

Abstract

More than two billion people have been infected with hepatitis B virus (HBV), 360 million have chronic infection and 600,000 die each year from HBV-related liver disease or hepatocellular carcinoma. Each year more than 66,000 health professionals are infected by hepatitis B virus and vaccination against hepatitis B saves the life’s of these health professionals. The aim of this study was to determine the prevalence and associated factors of hepatitis B vaccine coverage in a resource limited settings. A cross sectional study design was conducted. The study was conducted on 1184 health professionals at Amhara national regional state, Ethiopia. Simple random sampling technique was used. Structured questionnaire was used to collect the data. Descriptive statistics were used to identify the prevalence while Binary logistic regression was used to assess the determinants of hepatitis B vaccine coverage. The coverage of hepatitis B vaccine was 4%. Vaccination were affected by the high cost of the vaccine (AOR=0.25, 95%CI=0.1-0.63: P=0.03), year of experience (AOR=5.13, 95%CI=1.87-14.11: P=0.02), unavailability of the vaccine (AOR=0.25, 95%CI=0.1-0.63: P=0.03), year of experience (AOR=7.27, 95%CI=2.23-23.72: P=0.01). Low hepatitis B vaccine coverage was observed. The ministry of health should avail the vaccine to all those health professionals, develop awareness on HBV and improve the affordability of the vaccine.

Introduction

Hepatitis B is a contagious liver disease that results from infection with the hepatitis B virus (HBV). At initial infection, a person can develop an acute infection, which can range in severity from a very mild illness with few or no symptoms to a serious condition requiring hospitalization.1 Patients in the first 6 months manifest with the symptoms of acute viral hepatitis. Some patients fight the infection and clear the virus without any intervention. For others, the infection remains and leads to a chronic or lifelong illness. Chronic HBV refers to the illness that occurs if the HBV remains in a person’s body. HBV infection can result in devastating health problems;1 approximately 15-25% of patients develop serious health problems including liver damage, cirrhosis, liver failure, and hepatocellular carcinoma (HCC).1,2

Approximately 2 billion people have been infected with HBV, more than 360 million people have chronic viral hepatitis, and 600,000 annual mortalities have been registered due to HBV infection.2,6

Each year, more than 3 million health professionals suffer from percutaneous exposure to blood borne pathogens. More than 66,000 health professionals are infected by HBV, 500-600 health professionals are hospitalized, and more than 200 health professionals develop chronic hepatitis as a result of their occupation.2,9 Each year, more than 400,000 health professionals suffer from percutaneous injuries in the United State of America (USA).10 The prevalence of HBV infection in Brazilian health professionals is 0.8%.11

Sub-Saharan Africa (SSA) has a burden of 7-26% of chronic HBV infections.12 Approximately one-quarter (25.7%) of Nigerian surgeons are infected by HBV.13 The prevalence of HBV infection in Ugandan medical students ranges from 45-79%.14 The probability of HBV infection in an unvaccinated person with single sharp injury ranges from 6-30%, with higher risk among health professionals.5,15-17

The transmission of HBV is possible if a person is in contact with infected body fluids.2 HBV is more infectious than HIV (50-100 times), and humans are the primary reservoirs.15 Importantly, the virus can remain alive for 7 days outside the human being and can infect others.2 Vaccination is a primary way to prevent HBV infection.1 In USA, occupational exposure to HBV infection historically accounts for 4.5% of acute HBV cases.19

We have no medication that can cure HBV, which underscores the importance of hepatitis B vaccination. The hepatitis B vaccine is safe and effective if appropriate doses are given during a period of 6 months. With more than 90% effective protection after all doses,2,3,20,21

After the implementation of universal Hepatitis B vaccination in the 1990s by many countries, especially in the western world HBV mortality and morbidity reduced significantly.3 The hepatitis B vaccine averts new infection, which in turn leads to prevention of HCC.3,25,26

A 1998 study from Pakistan revealed that the coverage of hepatitis B vaccine among health professionals was 49%. Hepatitis B vaccination was affected by the high cost of the vaccine and the belief that they are not at risk of hepatitis B virus infection.27 A 2003 study in the USA showed that the coverage of hepatitis B vaccine among health professionals was 75% and was highest among nurses and white health professionals.28

Studies from Pakistan indicated that the coverage of hepatitis B vaccine among health professionals ranges from 49% to 86%.29,32 A 2009 survey from Pakistan identified that the most common reasons cited by health care workers (HCWs) for not getting vaccinated were forgetting dosage schedule, lack of awareness and negligence.33

Another study from Georgia in 2010 identified that the coverage of Hepatitis B vaccine among health care personnel was 12% for physicians and 54% for nurses. The uptake of the vaccine was affected by perception of the vaccine’s safety and perception of the risk of infection.34

Conflict of interest: the author declares no potential conflict of interest.

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Correspondence: Berhanu Elfu Feleke, Department of Epidemiology and Biostatistics, University of Bahir Dar, 1160 Bahir Dar, Ethiopia.

Tel.: +251.9181312095.

E-mail: elfufeleke@gmail.com; berhanue@bdu.edu.et.

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A 2011 finding from Pakistan predicted that work pressure, negligence, unaffordability and unavailability were the barriers for taking the hepatitis B vaccine.35

A 2013 finding from Lao PDR identified that the coverage of hepatitis B vaccine among health professionals was 21%, and the uptake of the vaccine was affected by sex, age, marital status, educational status, and poor knowledge about the vaccine.
vaccination among health professionals who
know where to receive the vaccine were 5.13
times higher (95% CI=1.87-14.11; P=0.02).
Peer pressure increased the probability of vac-
cination by 3.8-fold (95% CI=1.34-10.74; 
P=0.01). The hepatitis B vaccine was unavail-
able to 75.6% of health professionals. This fac-
tor decreased the odds of vaccination by 75% 
(AOR=0.25, 95% CI=0.1-0.63; P=0.03). As the 
years of experience increased, the odds of vac-
cination increased by 7.27-fold (95% CI=2.23-
23.72, P <0.01), (Table 3).

Discussion

The prevalence of Hepatitis B vaccine cover-
age was 4%, low compared to studies in sub-
Saharan Africa,38 may be due to the commit-
ment of the decision makers and health pro-
fessionals regarding the issues.

Work load decreased the probability of hepa-
titis B vaccination by 81% (AOR=0.19, 95%
CI=0.08-0.46). This finding agrees with find-
ings from Iraq.35 This finding may be becau
se health professionals may not have suffi-
cient time to go where vaccines are admini-
stered.

Negligence regarding hepatitis B vaccine 
decided the odds of vaccination by 96%
(AOR=0.04, 95% CI=0.01-0.11). This result 
agrees with findings from Iraq.35 This find-
ing may be because if they are negligent, 
they will not give importance to this issue.

Universal precaution training increased the 
发病率 of hepatitis B vaccination by 14.75-fold 
(95% CI=5.66-38.44). Approximately 63% 
of study participants perceived that they are not 
at risk for Hepatitis B. This belief decreased 
the odds of vaccination by 66% (AOR=0.34, 
95% CI=0.15-0.79). This finding agrees with 
findings from Georgia and Pakistan.28,37 This 
result may be because they will not become 
ready to avert the infection if they perceive 
that they are not at risk of the vaccine. The pol-
icy maker should understand that in-service 
training on universal precaution must be con-
sidered as one method of preventing HBV 
infection.

The cost of the Hepatitis B vaccine was unaffor-
dable to 79.9% of the study participants. 
This factor decreased the odds of vaccination 
by 88% (AOR=0.12, 95% CI=0.05-0.28). This 
result agrees with findings from Iraq and 
Pakistan.35,37 This finding is because health 
professionals are underpaid in sub-Saharan 
Africa, so that they cannot afford the payment 
for the vaccine because the vaccine is expen-
sive. The health authority should avail the vac-
cine at affordable cost to every health profes-
sionals.

Awareness of hepatitis B vaccine increased the 
probability of vaccination by 4.55-fold (95% 
CI=1.53-13.49). This finding agrees with 
results from Lao PDR, Iraq, and Pakistan.35,36,37 
This finding may be because health profes-
sionals will not understand the actual situation 
if they do not know about the vaccine. Only 
47.9% of health professionals know where to 
receive the hepatitis B vaccine. The odds of 
vaccination among health professionals who 
know where to receive the vaccine were 5.13 
times higher (95% CI=1.87-14.11). This find-
ing is because health professionals will not 
be able to receive the vaccine if they do not know 
where the vaccine is available. This suggests 
conducting sensitization camping among 
health professionals and implement strategies 
for wider vaccination.

Peer pressure increased the probability of 
vaccination by 3.8-fold (95% CI=1.34-10.74). 
This finding may be because peer pressure 
increases the awareness of the study partici-
pants. The hepatitis B vaccine was unavailable to 
75.6% of health professionals. This factor 
decreased the odds of vaccination by 75% 
(AOR=0.25, 95% CI=0.1-0.63). This result 
agrees with findings from Pakistan.27 This 
result is because unavailability hinders the 
accessibility of the vaccine. As the years of 
experience increased, the odds of vaccination 
increased by 7.27-fold (95% CI=2.23-23.72). 
This result agrees with findings from Iraq.37 
This result may be because the health profes-
sionals’ awareness of the vaccine increases as 
they become more experienced.

Universal precaution training increased the 
odds of Hepatitis B vaccination by 14.75-fold 
(95% CI=5.66-38.44). This training will 
increase awareness of infection prevention 
among health professionals so they will 
become ready to become vaccinated2 (Table 3).

Conclusions

Low levels of Hepatitis B vaccination were 
observed. Work load, negligence, training on 
universal precaution, unaffordability, aware-
ness, knowledge where to get the vaccine, 
peer pressure, unavailability and years of 
experiences were the predictors of Hepatitis 
B vaccination. The availability and affordability 
of the vaccine was limited to all health profes-
sionals working in hospitals. The issue of HBV 
vaccine was not given due attention by deci-
sion makers.

Recommendations

The decision makers should make the vac-
cine available at an affordable fee to all health 
professionals working in health institutions. 
Efforts should be made to increase the aware-
ness of health professionals about hepatitis B.

Table 2. Non-significant variables for hepatitis vaccination (n=1125).

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cross tabs</th>
<th>Unvaccinated</th>
<th>COR [95% CI]</th>
<th>AOR [95% CI]</th>
<th>P-value</th>
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<td>2.09 [0.73-6.0]</td>
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<td>26</td>
<td>638</td>
<td>0.95 [0.5-1.81]</td>
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<td>527</td>
<td>1.44 [0.76-2.74]</td>
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Table 3. Determinants of Hepatitis B vaccination coverage (n=1125).

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<th>AOR [95% CI]</th>
<th>P-value</th>
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<td>0.62 (0.3-1.29)</td>
<td>0.04 (0.01-0.11)</td>
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<td>12.31 (5.43-28.98)</td>
<td>14.75 (5.66-38.44)</td>
<td>&lt;0.01</td>
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<td>Perception that they are not at risk</td>
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<td>0.31 (0.16-0.61)</td>
<td>0.34 (0.15-0.79)</td>
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<td>12</td>
<td>1.27 (0.61 - 2.59)</td>
<td>4.55 (1.53-13.49)</td>
<td>&lt;0.01</td>
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<td>Knowledge where to get vaccine</td>
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<td>1.51 (0.8 - 2.88)</td>
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<td>Peer pressure</td>
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<td>&lt;2 years</td>
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<td>&gt;=2 years</td>
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References

1. CDC. General information on hepatitis B virus. Atlanta: CDC Departement of Viral Hepatitis; 2010.
2. CDC. Hepatitis B Information for the Public. Atlanta: CDC Departement of Viral Hepatitis; 2009.


