A Cross-sectional study on the Knowledge, Attitudes and practices toward hepatitis B virus vaccination statusamong Lao Dental Students

Abstract

Introduction: hepatitis B virus (HBV) infection is a global health problem is a worldwide health concern. The health worker are risk of exposure especially among dentist, to prevent and control of HBV infection is need to have Good knowledge, attitude and practice (KAP).This study had been assessedtheKAPofhepatitis B virus infectionpreventionand investigate the vaccination status among Lao dental student at the University of Health Sciences.

Aim: To investigate Lao dental universitystudents'knowledge, attitudes and practices towards hepatitis Bvirus vaccination status

Method: A cross-sectional studywith quantitativemethod usinga questionnaires comprising 42 questions was designed to assess the knowledge, attitudes and practices towards hepatitis Bvirus infection among dental studentsat the University of Health Sciences, Faculty of Dentistry and serum was test for HBV surface antigen by rapid test and anti HB surface antigen were quantified by ELISA. Statistical package for Social Sciences Program SPSS and the Chi- square test were used in describe compare variables and P value < 0.05 was considered significant.

Result : Among of 223 participants were retained for the study out of 304 in dental students, the mean age was 23.6(SD 3.5)year and 60.1% were female. 102(45.7%)of dental students had good level of knowledge of HBV infection, the women were 1.17time (95%CI:1.03-1.33, *P*= .01). more likely to had a good knowledge than man. Participants with 4th year students level were more (95%CI: 0.04(0.00-0.31) *P*< .001)likely have good level knowledge than another students level. with 96.4% were recognized that dentist and health care worker are at risk of contracting, with 71.8% agree that HBV is the most wide spread. About 63.2%of the students agree that all health care worker should receive the B virus vaccination before working in the dental clinic. Only1.3% has received at least one dose of HBV vaccine, in contrast 88.3% who never had any dose of HBV vaccine. The proportion of HBsAg was 1.3% which indicated that chronic HBV infection and the unsophisticated of HBV infection were 87%.

Conclusion

The dental students are high risk of HBV infection because of very low vaccine uptake. present study reveals an overall shown that they have low level of knowledge, fair attitude, and practice, therefore we recommend that all dental students should be receive 3 doses of vaccine before their entry into clinical practice area

Key words:*Hepatitis B vaccine, knowledge, Attitudes, Practices, Lao dental student*

Introduction

Hepatitis B virus (HBV) infection is a global health problem Up to 900 000 people die each year from hepatitis B and its complications such as cirrhosis and liver cancer[1]. Working at dental Clinical is high risk of exposure and transmission to their patients, it is commonly transmitted through blood , and infection body fluids, if dental health care worker unvaccinated have a 10 times to risk of becoming infected with hepatitis B because this diseases is easily to transmitted [2]. Hence, dental surgery should be prevented by the routine exercise of good clinical hygiene. Dental students in clinic practical are contact with patients and it danger of acquiring viral hepatitis.

In Lao people's democratic Republic (PDR) is one of countries in Asian with highly endemic of Hepatitis B infection, up to 10% chronic infections in adults Work [3]. The data on hepatitis B knowledge and attitudes of Lao dental students are lacking; similarly the vaccination status reported of dental students who are risk of getting from

this infection is limited. The dental students should not only learn treatment but also need to know the epidemiological aspect of disease such as transmission, prevention and control the spread of this disease in dental hospital and society. Therefore, this study will conducted to investigate the knowledge, attitudes and practice toward hepatitis B vaccination status amongLao Dental Students

Methodology

A descriptive cross- sectional study had been conducted to determine the vaccination status, knowledge, attitudes, and practice, this study had been conducted in March /2023 to March /2024.

Theparticipants include male and female students attending third, fourth, fifth and sixth grades as well as on postgraduate dental students at the faculty of dentistry, university of Health Sciences was interviewed about their knowledge, attitudes and practice on hepatitis B vaccine. Inclusion criteria: dental students in fourth, fifth and sixth grades as well as on postgraduate dental students who are stay in Vientiane at the time of this study and agree to participate in this study. Exclusion criteria: dental students in grades 1-2 were excluded. Dental Students who stay in another provinces and upset during the time of this study, dental students who not willing to give consent to participate in study will be exclude. The sample size waspower to determine the prevalence of hepatitis infection in the study population. The sample size were calculated by using the Cochran Formula (John Wiley &Sons, 1977):

$$n = \frac{(Z)^2 xP(1-P)}{d^2}$$

$$n = \frac{(1.96)2 \times 0.05(1-0.05)}{(0.03)2} = 202$$

Where Z= 1.96, d= 0.03 and P=0.05 (from 2020 study in Laos)

by adding 10% for non-response rate, the total of participants was 223 students. The study participants were selected by a random sampling technique. The number of students in each grade was rounded up to 47 Sampling method: According to the dental curriculum at the university includes six academic years of undergraduate study and two years of postgraduate, Clinical practice and patients contact start from the third grade forwards.

Data collection:A brief face-to-face the questionnaire were used for data collection in this study, close-end and open questions were divided into three parts. The first part is demographic characteristic of students who participant including age, gender, and academic level. The second parts are Knowledge of vaccine. The third part was investigated the behavior and attitude towards vaccination and their vaccine status. A total questionnaires are 42 which consists of 22 questions on knowledge, 8attitude, 8practices and 4vaccination status . Before this study start the questionnaires forms was pre-tested on random 30 samples of dental students in other classes which not included in the sample size in this study. Each correct response was allotted one mark , a few question were having multiple options

Serology assays:

After completion the interview , nurses was take a blood sample from median cubical vein in each participant, 5mL of blood will be collected into a test tube by using a syringe 10ml and disposable hypodermic needle (1 inch or 2.54 cm) [4]. Samples identified with a consecutive code were transported to the Laboratory of central hospital . The hepatitis B surface antigen (HBsAg) status was determined by rapid test (Standard Diagnostics, Lumiquick, USA). Following manufacture instructions. The blood was centrifuged to obtain serum and stored at -8°c until further use. The anti HBs, and anti-HBc were detected using enzyme linked immunosorbent assay(ELISA) for the qualitative in serum or plasma (Bioneovan Co., LTD, Beijing, China), following the manufacture's instructions.

Data analysis :

The blood was centrifuged to separate the serum use for research of antibodies. The serum sample were test qualitatively for the serological markers Anti-HBs. This was used the enzyme-link immunosorbent assay test (ELISA) following the manufacturer's instructions. The multivariable analysis to determine the predictors of HBsAg positive and the presence of anti-HBs. The anti-HBs of ≥10IU/L was considered as the natural immunity of HBV. With a P value of <0.2 all factors with P value of <0.05 at 95% confidence interval were considered statistically significant

Statistical analysis:

Data were entries in databases by using Microsoft excel 2017 and statistical package for Social Sciences Program version 26 (SPSS Inc., Chicago, IL) had been used for data analysis. Categorical variables obtained from the questionnaire had been described as frequencies and percentages, and the Chi- square test had been used in describe compare variables. P value < 0.05 were declared as statistic significant. T-test had been conducted to compare knowledge between different grades. The level of knowledge, attitude, and practices of the study participants were assessed using the sum score of each outcome based on Bloom's cut-off point[5][6][7], (>80%–100%) high levels, (60%–80%) moderate levels , and (<59%) low levels. For knowledge: Good: ≥ 15-22 points, Moderate 8-14 points,and Low: 0-7 points.For attitudes and practices: Good: ≥6-8 points, Moderate 3-5points, and Low: 0-2 points.

Result

Characteristics of Participants

Out Of the304 Lao dental students, 223 were included in this study, the response rate was 73.3%.Among participants were female 134(60.1%) and 89 (39.9) were male. In age was range between 22-41 years; 29 (13.0%) were postgraduate students and 194(86.9%) was an undergraduate student. Among 223students, 48 were third year students, 50 fourth year students, and 50 were fifth year students, 46 six year students(table1).

Level of Knowledge on HBV

The participants had right level of knowledge of HBV infection was 98(43.9%)most of participants correctly the transmitted through dental treatment 182(81.2%), and HBV transmitted from patient todentist181(81.2%), HBV was contaminated blood and body fluids 180(80.7%), transmitted by needle stick during dental treatment 177(79.4). Up to 132(59.2%) knew that HBV can be transmitted by genes. Only 36(16.1%)of students were aware about fever can also occur as aSymptoms of HBV infection.Nevertheless most students were well aware about spread of hepatitis B, but there were misconception also as 122(64.7) holding hands with an infected person, sharing toilets 87(39.0), and Drinking same cup 55(24.7)(table2). There were female were 1.17 time more likely to have a good knowledge than man with (95%CI: 1.03-1.33, P = .01).Students 4th year had high knowledge level 5.68 withsignificant more another student classes (95%CI: 2.35-13.7, P< .001) as in (table 3). the overall distribution of knowledge, attitude and practice about HBV had been shown in the (table 4) and (graph1)bloom cut off.

Attitudes toward HBV infection,

The majority of students have a positive attitude with96.4% were recognized that dentist and health care worker are at risk of contracting, with71.8% agree that HBV is the most wide spread. About 63.2%(141/223)of the students agree that all health care worker should receive the B virus vaccination before working in the dental clinic. with 89.7% were willingnessto treating HBV patients, about two third 67.7% were comfortable to work as the same environment as a person infected with hepatitis B

Practical measures for HBV prevention andperception of HBV vaccine, and vaccination status

Regarding preventive and protective practice, showed that 77.2% percent of participants has concerning regarding being infected with HBV, and 89.2% of participants respond for wearing gloves before touching patients, 99.6% using face mask, and 78.0% used protected eyes wear during contract and treatment patients. With 74.5 had a needle stick or sharp during working at the dental area, and wash their hand after contract with patient's body fluids96.0%.Only3(1.3%) has received at least one doseof HBV vaccine, in contrast 197(88.3%) who never had any dose of HBV vaccine (table5).

Serelogical profiles

The result showed that the number of participants who had been exposed to HBV positive of Anti-HBsAg 3(1.3%) which indicated that they had chronic HBV infection.27(12.1%) had Anti-HBs>10mlU/mL while

193(86.5%) had no immunity (Table 6)

Table1: Demographic characteristics of the study sample (n=223)

Variables	Frequency	Frequency(%)
Gender		

Female	134	(60.1%)
Male	89	(39.9%)
Age (Years)		
18-25	193	(86.5%)
26-35	27	(12.1%)
36-41	3	(1.3%)
Classes		
3rd year	48	(21.5%)
4th year	50	(22.4%)
5th year	50	(22.4%)
6th year 46	(20.6%)	
Post graduate	29	(13.0%)
Total	223	(100%)

Table 2: Knowledge of participated dental students to wards hepatitis B infection at University of Health Sciences (n=223)

Hepatitis B knowledge questions	Correct answers N (%)
1. HBV could transmitted through dental treatment	182(81.2)
2. HBV could have transmitted from dentist to patient	113(50.7)
3. HBV could have transmitted from patient to dentist	181(81.2)
4.HBV sensitive to low temperature, dryness, and UV rays	55(24.7)
5.HBV could be survived for prolonged time on unsterilized surface	116(52.0)
6.HBV could be infectious outside the body	97(43.5)
7.HBV infection always have symptomatic	62(27.8)
8.Symptoms could appear people who got HBV infection	36(16.1)
9.HBV transmitted by needle stick during dental treatment	177(79.4)
10.HBV lead to other types of hepatitis infection	108(48.4)
11.HBV is less infectious when compared with HIV	93(41.7)
12.HBV could be contaminated blood and body fluids	180(80.7)
13.HBV can be transmitted by genes	132(59.2)
14.HBV could transmitted through the air	62(27.8)
15.HBV could Transmitted by from sexual relationship	114(51.1)
16.HBV could Transmitted by during birth	93(41.7)
17.HBV could Transmitted by sharing spoon or bowls for food	51(22.9)
18.HBV could Transmitted by sharing a toothbrush with an infected person	47(21.1)
19.HBV could Transmitted by holding hands with an infected person	122(64.7)
20.HBV could Transmitted by sharing toilets	87(39.0)
21.HBV could transmitted by drinking same cup	55(24.7)

HBV: hepatitis B virus

Table 3 factors associated with good knowledge of HBV infection

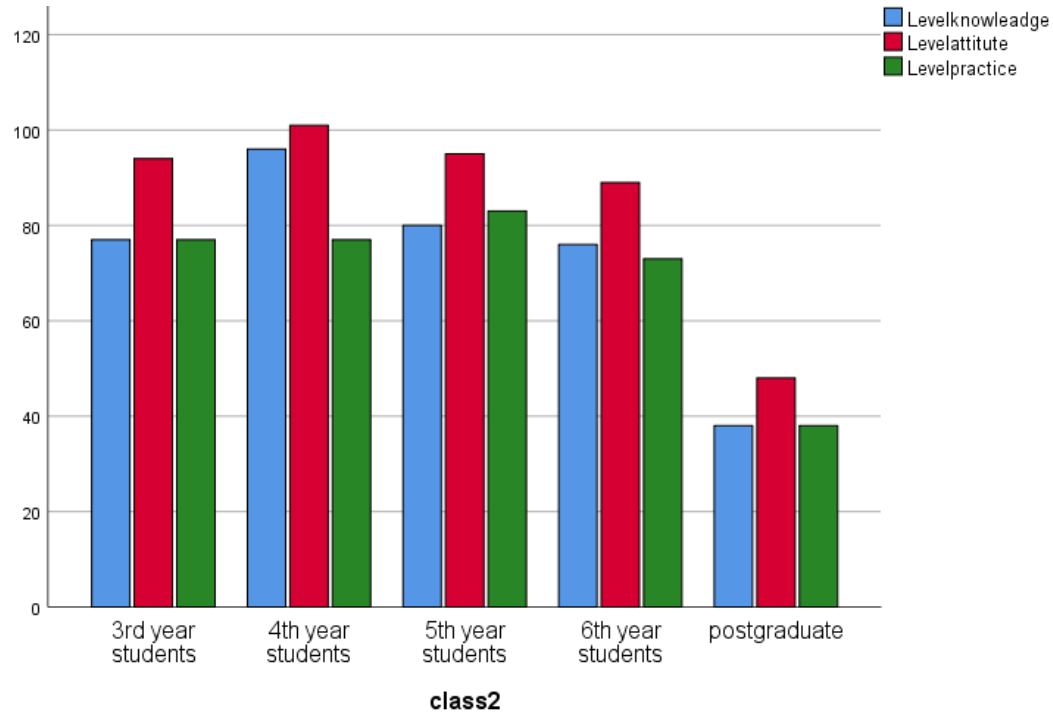
Variable	Total	Good knowledge n (%)	OR (95%CI)	P-value
Age				
19-25	192	26(11.7%)	0.39(0.32-0.47)	0.00*
26-41	31	9(4.0%)	1	
Sex				
Male	89	10(11.2%)	1.17(1.03-1.33)	0.01*
Female	134	25(18.7%)	1	
Level of education				
Postgraduate	29	8(27.6%)	2.18(0.44-10.72)	0.33**
			1	
6th year students	46	24(52.2%)	0.43(0.79-2.43)	0.34**

5th year students	50	22(44.0.2%)	1 0.52(0.09-3.03)	0.47**
4th year students	50	30(60.0%)	1 0.04(0.00-0.31)	0.00**
3rd year students	48	18(37.5%)	1 0.45(0.09-2.25)	0.33**

Abbreviation:OR, Odds ratio, confidence interval,* Binary logistic regression ** Multiple logistic regression

Table 4. Level of knowledge, attitude and practice score of the dental students(blooms cut off)

Knowleadge score(22)	**postgraduate**	**6th year**	**5th year**	**4th year**	**3rd year**		
High(15-22)	17	8	15	24	26	22	19	30	22	18
Moderate(8-14)		4		7		2		1		8
Low(1-7)										
Attitude score(8)										
High(6-8)		21		28		30		29		28
Moderate(3-5)		6		13		17		8		16
Low(0-2)		2		5		3		13		4
Practice score(8)										
High(6-8)		20		21		22		27		29
Moderate(3-5)		9		24		26		19		13
Low(0-2)		0		1		2		4		6



graph1. Level of Knowledge, attitude and practice score of the students

Table5. Practices of dental students towards hepatitis B prevention at the University of Health Sciences

HBV practice and Vaccination questions	Yes n(%)	Non(%)
Have you ever screened for hepatitis B?	30(13.5)	193(86.5)
Do you wear gloves before touchingpatient?	184(89.2)	39(10.8)
Have you had a needle stick or sharp or prick?	218(97.8)	5(2.2)
Do you wear goggles during treatment procedures of patient?	174(78.0)	49(22.0)
Have you treated a hepatitis B virus patient?	221(99.1)	2(0.9)
Do you wash your hand after contact with patient's body fluids?	214(96.0)	9(4.0)
Do you using mask to protect yourself when treating patient?	222(99.6)	1(0.4)
Do you bend needles into a medical waste container?	171(76.7)	52(23.3)
Have you concern regarding hepatitis B virus infection?	172(77.2)	51(22.8)
Have you got hepatitis B virus vaccination ?	26(11.7)	197(88.3)
How many vaccine doses hepatitis B virus ?		
One dose	3(1.3%)	
Two doses	9(4.0)	
Three doses	14(6.3)	

Table6. Result of HBsAg and Anti-HBs distributed by level of education

	Number(%)			
Sample group	**HBs Ag positive**	**Anti-HBs Positive**	**Anti-HBsNegative**	**Total**
Postgraduate	0 (0)	1(3.4)	28(96.6)	29
6th	2(4.3)	6(13.0)	38(82.7)	46
5th0 (0)	10(20.0)	40(80.0)	50	
4th	1(2.0)	9(18.0)	40(80.0)	50
3rd	0 (0)	1(2.1)	47(97.9)	48

Discussion

The global Health Sector strategy toward hepatitis B (HBV) for elimination as major threat and reducing new infections but HBV remain worldwide problem and common in south east Asia with rate of chronic infection of 7-10% among the general population [8]. The healthcare worker including dental professional is high risk to exposed of the HBV infection to as they efficiently transmitted of blood borne and body fluids [9]. To prevent or reduce of this infection disease the infection control guidelines should be applied. The cross-sectional study was carried out to assess the level of knowledge,attitudes, and practice and also finding out the prevalence of hepatitis B among dental students at University of Health Sciences, Laos.

The result of this study, describes the KAP towards HBV infection among dental students at the University of Health Sciences. Our result shown that the overallof knowledge regarding HBV about transmission through dental treatment and from patient to dentist was high (81.2%) contaminated blood and body fluids, contaminated needle stick during dental treatment patients. This finding was consistent with the previous study from Northwest Ethiopia[10].It was higher than 77.2 dental student knowledge in ADENuniversity[11] and Saudi Arabia among dental student that reported high level knowledge of HBV infection[12].Nonetheless, we found that most of students were well aware about spread of hepatitis B, but there was misconception of HBVcould be lead to other types of hepatitis infection, andtransmitted by holding hands with an infected person, sharingtoilets, and drinking same cup. The finding of current study which revealed that only 102(45.7%)of dental student who had good knowledge of HBV infection.There is a slightly significant difference between female and male in knowledge. The fourth year students had lowest a significantly knowledge score, this cloud be because their level study the microbiology within their present class.Although almost students in senior level show as low level of knowledge, they show higher in level of attitude and a good level of practice that may indicate the infection control measurement is constraint, this is need for encouragement to conveys the course of training.The participates with 96.4% recall that health care worker are more at risk of being infection with HBV than another work, and 70% of participants though that HBV vaccine was safe, despite that there was 88.3% who never had any dose of HBV vaccine, there were several studied suggest that the vaccination being a prerequisite for clinical work [13,14]

Regarding the statement on attitude, the obtained data showed better attitudes of female higher than males,
WHO recommend that the preventive of vaccine to all health worker in countries which high HBV located . however in this study had the less than one third among the study compared to a number of similar studies[15,16,17]. This low number of HBV vaccine might be unapproachable or high cost of vaccine. In this study , approximately more than two thirds of participants were geologically with no against HBV infection this large amount is concerning and it higher than previous study in Laos[18, 19]

Conclusion

The dental students are high risk of HBV infection because of very low vaccine uptake. present study reveals an overall shown that they have low level of knowledge, fair attitude, and practice,therefore we recommend that all dental students should be receive 3 doses of vaccine before their entry into clinical practice area.

Consent

All participants were informed about the study in details and sign an consent form.

Ethical considerations

The study was approved by the ethic committee for health research from the University of Health Sciences, Ministry of Health , Lao PDR (REC 503/2023)

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Limitations

This present study data was obtained by questionnaire , there could be a recognized bias of the participants. And this study was conducted only in dental students there is a need to conduct future studies for all students in health care the University of Health Sciences who are practicing and working in the clinical.

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