ORIGINAL ARTICLE

Effect of Institute and Educational Level on Knowledge, Attitude and Practice regarding Hepatitis B and C and Vaccination of Hepatitis B Among Medical Students of Karachi, Pakistan

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ABSTRACT

Background: Medical students are usually at high risk of exposure to hepatitis virus. Though, studies revealed that less knowledge, low attitude and practice rate were found among these students for infections.
Objective: To determine the effects of type of college (private/public) and educational level (pre-clinical/clinical group) on the knowledge, attitude and practice regarding hepatitis B and C viruses, and vaccination status among medical students.
Subjects And Methods: It was a cross sectional study conducted in 7 undergraduate medical colleges/universities of Karachi. Data were collected from October 2007 to February 2008 through convenient sampling technique. A pre-tested questionnaire was distributed among 1509 students after taking verbal consent. It contained questions regarding awareness about prevention and transmission, diagnosis and treatment of hepatitis B and C. In addition, it also inquired about the vaccination status of hepatitis B, the awareness of students regarding post exposure prophylaxis and the observations during their clinical rotations. The years of education were categorized into pre-clinical (1st and 2nd year) and clinical (3rd, 4th and 5th years) groups. Chi square was used to find the association between type of colleges and level of education (pre-clinical/clinical) with response variables.
Results: Out of 1509 subjects surveyed, 937 (62.1%) were from public administered colleges and 794 (52.6%) were from clinical group. Eighty five percent of the respondents indicated that they were aware of availability of a vaccine for hepatitis B. Clinical group showed significantly higher percentage than pre-clinical group. Only 57.1% of the students displayed excellent knowledge about the routes of spread of hepatitis B & C. Students of private colleges portrayed relatively better knowledge for treatment procedures than public college students ($P<0.0001$). Clinical group and private college students showed significantly higher knowledge of availability of post exposure prophylaxis for hepatitis B. 53.4% interviewees considered that a patient with hepatitis B should abandon the sexual contacts. About 71% of the respondents were found to be vaccinated with all the 3 doses. Our study revealed a relatively better practicing attributes among private college students, and therefore lesser accidental needle pricking episodes were found in the same group.
Conclusions: Students from private institutes and clinical group showed higher knowledge, attitude and practice related to hepatitis B & C viruses.

Key words: Hepatitis B, Hepatitis C, KAP, medical colleges, year of study, medical students, Karachi, vaccination.

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INTRODUCTION

Hepatitis B and C undoubtedly are considered as major and rapidly spreading viral infections. According to a published report two billions people worldwide are infected with hepatitis B virus (HBV) and 360 million with chronic hepatitis, out of which 600 thousand dies every year.[1] Mother to child, blood fluids,[1,2] unprotected sexual contacts,[1,3] needle sticks injuries,[2] sharing toothbrushes,[3] and person to person contact[2-4] have been reported as major sources of transmission. The prevalence of hepatitis B in Pakistan is reported in between 3-4%[5] and about 6% (ten million people) is currently suffering from hepatitis C.[4]

Medical students are at high risks as they are in direct contact with patients, needle sticks and other surgical instruments.[6] A study showed that 45-65% of the medical students are at least once exposed to body fluids during their medical training.[7]

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In spite of high prevalence of disease around the globe, the efforts to control the HBV gained large success due to development and licensing of vaccine in nineteen nineties. However, surveys showed that health professionals were not fully vaccinated, even though they are on high risk.[8,9] Knowledge rate is also not found satisfactory in some studies[10] especially, in pre-clinical students.[7,10] Briefly, most of the studies indicated that personnel working in medical and health related organizations are at high risk of hepatitis B and C,[3,5,11] but showed low knowledge. Literature showed that all of the studies conducted in Pakistan were either organized in private medical institutes or only one institution. Therefore this study was conducted in 2007 to determine the knowledge, attitude and practices (KAP) for hepatitis B and C and vaccination status among medical students of both private and public medical colleges of Karachi. A part of the study is already published earlier.[12]

OBJECTIVE

To determine the effects of type of college (private/public) and educational level (pre-clinical/clinical group) on the knowledge, attitude and practice regarding hepatitis B and C viruses and vaccination status among medical students.

SUBJECTS AND METHODS

It was a cross-sectional study conducted in 7 undergraduate medical colleges/universities of Karachi, namely; Dow Medical College, Sindh Medical College, Baqai Medical College, Aga Khan University, Ziauddin Medical College, Karachi Medical & Dental College and Hamdard Medical & Dental University. Data were collected during October 2007 to February 2008 through convenient sampling technique. The study was approved by Ethical Review Board of Dow University of Health Sciences. A pre-tested questionnaire was distributed among 1509 students after taking verbal consent. It contained questions regarding awareness about prevention and transmission, diagnosis and treatment of hepatitis B and C. In addition, it also inquired students about their vaccination status for hepatitis B, awareness related to post exposure prophylaxis and the observations during their clinical rotations. The detailed methodology is discussed in an earlier article.[12] To make the analysis easy, the years of education have been divided into pre-clinical (1st and 2nd year) and clinical (3rd, 4th, and 5th years) groups. Furthermore, the questions asked to assess the knowledge of transmission of hepatitis, diagnosis, treatment procedures, preventive methods, bedsides dealing, and transmit of viruses through dental procedures were grouped as follows:

1 Thirteen options for transmission were: blood contacts, sharing razors, mother to child, sexual contacts, sneezing by patients, eating food prepared by an infected person, sharing tooth brush, shaking hands with infected person, pricking through contaminated needles, injection syringes, cough by the patients, eating unhygienic foods and surgery (dental/medical). Correct answers were grouped as: 0-5 = poor, 6-10 = good and 11-13 = excellent.

2 Five options for diagnosis were: urine test, blood test, sputum culture, sign and symptoms of the patients, and stool test. Correct answers were grouped as: 0-3 = poor, 4-5 good.

3 Five options for treatment procedures were: interferon, herbal drugs, blood transfusion, ribavarine and antibiotic. Correct answers were grouped as: 0-3 = poor, 4-5 = good.

4 Five options for preventions were: vaccination, using boiled/mineral water, avoiding cuts or pricks by contaminated syringes or surgical instruments, avoiding unhygienic foods, and avoiding sexual contacts. Correct answers were grouped as: 0-2 = poor, 3-4 = good, 5= excellent.

5 Five options of dental procedures which could spread hepatitis B & C were: braces, implant, filling, scaling, and root canal. Correct answers were grouped as: 0-3 = poor and 4-5 = good.

SPSS version 16 was utilized for all the statistical computations. Chi square was used to find the association between type of colleges and education level (pre-clinical/clinical) with response variables. $P < 0.05$ was considered as significant level.

RESULTS

Among 1,509 subjects surveyed, 937 (62.1%) were from public administered colleges and 794 (52.6%) were in the clinical years of their studies.

Knowledge: Table 1 shows the knowledge about the availability of vaccines and the treatment methods for hepatitis B & C patients. Eighty five percent of the respondents indicated that they were aware of availability of a vaccine for hepatitis B. Nineteen percent wrongly stated that a vaccine is available for hepatitis C. With the increasing level of education, the knowledge of availability of vaccines for hepatitis B & C significantly increased ($P < 0.0001$). Only 57.1% of the students showed excellent knowledge about the routes of spread of hepatitis B & C. Private college students and clinical year students showed significantly higher overall knowledge about these viruses ($P=0.006$ & $p<0.001$, respectively). Eighty nine percent of the

students showed a 'good' level of knowledge for diagnosis of hepatitis B and C. However, in response to treatment procedures for hepatitis B & C, only 48.2% students showed 'good' knowledge. Students of private colleges portrayed relatively better knowledge than public college students (P<0.0001). On questioning about the curability of hepatitis B, 53.9% replied 'curable but up to the certain level', with public college students showing relatively higher proportions than private college counterparts (P=0.029). For hepatitis C, 39% of the students answered that it is curable but up to certain level. Among them, clinical years' students indicated good proportion of knowledge about curability of hepatitis C. (P<0.001). The knowledge of prevention from hepatitis B and C was 'excellent' or 'good' of about 90%. Every nine out of ten respondents were positive for the 'Can someone appearing healthy be a patient?' with clinical group of students showing higher proportion. (P=0.003). Half of the respondents showed good knowledge of prevention during dental practices, whereas pre-clinical medical students were found to have less knowledge for the same as compared to clinical group students (P<0.001). Very few students were aware of "any post exposure prophylaxis available for hepatitis B", with private college students and those from clinical groups dominating in this regard to a significant extent with P=0.001 and P<0.001, respectively.

Attitude: Table 2 explains the attitude of the medical students towards the hepatitis B and C patients. Seventy percent of students responded positively that patients should be allowed to work routinely. Students in the clinical years showed higher percentage of correct attitude (P<0.001) towards this question. About every three of the four students recommended that hepatitis patients should not be isolated. Students of clinical groups indicated significantly higher percentage than pre-clinical group (p<0.001). Eight hundred and six (53.4%) interviewees considered that these patients should abandon the sexual contacts. Students from private institutions and pre-clinical group showed significantly higher percentage than public institutions and clinical group, respectively (p<0.001). Sixty percent of the believed that arranging seminars can help in encouraging students to get vaccinated, while 39% enunciated to encourage by door to door campaign and 79% indicated to do it by media. Pre-clinical group students indicated significantly higher opinion for 'door to door campaign' and through 'media awareness' (P<0.05).

Practice: Table 3 depicts the practices of respondents in regard of protection against hepatitis B. Vaccination status for hepatitis B among the students was found to be quite encouraging (78.7%). Interestingly, public college students' vaccination status was better than private college students' (P=0.008). About 71% of the students responded to be fully vaccinated with clinical group of students dominating in this aspect (P=0.003). More than half of the respondents uncovered the fact that their fathers, mothers and sibling were vaccinated. Private college students practice rate was relatively better than public college students (P=0.03). Sadly speaking, accidental needle pricks were found more in public college students (P = 0.01).

DISCUSSION

This study was conducted in 7 medical/dental colleges of Karachi. At the beginning of this study of year 2007, only 8 medical colleges existed in Karachi. Therefore, the outcomes of the study are quite representative of Karachi medical college students. The mean and gender distribution of this article were the same as reported by one of the authors in an earlier study on medical students.[13] Our study shows almost the same level of knowledge about availability of hepatitis vaccine as was shown by Nasir et al (7), unlike the other study that depicted about 10% more awareness for availability of vaccine B as compared to this study.[10] Though, the knowledge of clinical groups' students in both the studies was not statistically higher as compared to pre-clinical groups' students, it was quite unexpected that a significant percentage of the medical students did not know about the availability of vaccine for hepatitis B, even though it was developed somewhat three decades ago and was recommended by World Health Organization to be included into national immunization programs of all highly endemic countries since 1995 and all other countries since1997.[14] Knowledge about route of transmission of disease was found reasonably satisfactory in this study. Private college and clinical group students showed significantly better knowledge than public colleges and pre-clinical group students. These findings are in agreement with Anjum et al,[10] Memon et al,[15] Chabra et al,[16] and Ghahramani et al.[17] However, one study from a private medical college of Pakistan[18] showed much higher percentage for rout of transmission of disease as compared to this study. But a Iranian study[19] disagreed with this result and showed moderate to low knowledge about routes of transmission among the health care workers. Furthermore, some studies[10,17,18] agreed with the result of this study that clinical group students have significantly better knowledge about routes of transmission than pre-clinical group students. About one out of four respondents of this study indicated to have knowledge about the post exposure prophylaxis for hepatitis B with significant higher value for clinical group than

Table 1: Assessment of Knowledge of Medical Students about Hepatitis B and C

Question	College			Year of Study			Total
	Public 572 (37.9)	Private 937 (62.1)	p-value	Pre-Clinical 715 (47.4)	Clinical 794 (52.6)	p-value	
Is vaccine available for Hep B	787(84.0)	497(86.9)	0.125	561 (78.4)	723 (91.2)	<0.0001	1284(85.1)
Hep C	167(17.8)	119(20.8)	0.152	188 (26.3)	98 (12.4)	<0.0001	286(19.0)
Knowledge rate … poor	33(3.5)	27(4.7)		39 (5.4)	21 (2.6)		60 (4.0)
Good	394(42.0)	194(33.9)		363 (50.7)	225 (28.4)		588 (39.0)
Excellent	510(54.4)	351(61.4)	0.006	314 (43.9)	547 (69)	<0.001	861 (57.1)
Diagnosis rate poor	100(10.7)	73(12.8)		114 (15.9)	59 (7.4)		173 (11.5)
Good	837(89.3)	499(87.2)	0.216	602 (84.1)	734 (92.6)	<0.001	1336(88.5)
Treatment rate poor	543(58.0)	238(41.6)		562 (78.5)	219 (27.6)		781 (51.8)
Good	394(42.0)	334(58.4)	<0.0001	154 (21.5)	574 (72.4)	<0.001	728 (48.2)
Is hepatitis B …. Completely curable	259(27.6)	193(33.7)		204 (28.5)	248 (31.3)		425 (30.0)
Curable upto certain level	523(55.8)	290(50.7)		383 (53.5)	430 (54.2)		813 (53.9)
Not curable	78(8.3)	35(6.1)		43 (6)	70 (8.8)		113 (7.5)
Don't know	77(8.2)	54(9.4)	0.029	86 (12)	45 (5.7)	<0.001	131 (8.7)
Is hepatitis C completely curable	120(12.8)	78(13.6)		99 (13.8)	99 (12.5)		198 (13.1)
Curable up to certain level	356(38.0)	232(40.6)		253 (35.3)	335 (42.2)		588 (39.0)
Not curable	339(36.2)	186(32.5)		232 (32.4)	293 (36.9)		525 (34.8)
Don't know	122(13)	76(13.3)	0.537	132 (18.4)	66 (8.3)	<0.001	198 (13.1)
Prevention rate poor	85(9.1)	70(12.2)		109 (15.2)	46 (5.8)		155 (10.3)
Good	597(60.5)	291(50.9)		423 (59.1)	435 (54.9)		858 (56.9)
Excellent	285(30.4)	211(36.9)	0.001	184 (25.7)	312 (39.3)	<0.001	496 (32.9)
Can someone who appears healthy be a patient? YES	809(86.3)	501(87.6)	0.468	597 (83.4)	713 (89.9)	<0.001	1310 (86.8)
Dental rate Good	451(48.1)	301(52.6)		313 (43.7)	439 (55.4)		752 (49.8)
Poor	486(51.9)	271(47.4)		403 (56.3)	354 (44.6)	<0.001	757 (50.2)
Are you aware of any post exposure prophylaxis available for Hep b	153(16.3)	142(24.8)		46 (6.4)	249 (31.4)		295 (19.5)
Hep c	25(2.7)	14(2.4)		12 (1.7)	27 (3.4)		39 (2.6)
Both	37(3.9)	16(2.8)		2(0.3)	51(6.4)		53(3.5)
None/don't know	722(77.1)	400(69.9)	0.001	656(91.6)	466 (58.8)	<0.0001	1122(74.4)

pre-clinical group students. Nisar et al (7) also portrayed considerably low amplitude of knowledge regarding post exposure prophylaxis of hepatitis B, however there was no significant difference between pre-clinical and clinical group. Furthermore, Anjum et al reported that 85% of the students of a private medical college of Pakistan agreed for the availability of post exposure treatment for hepatitis B with significant higher percentage among clinical group students than pre-clinical group students.

Seventy one percent of the respondents reported having been vaccinated against hepatitis B, which is very close to recently reported data from a private medical college of Pakistan.[7] However, there was no statistical significance difference between pre-clinical and clinical groups as compared to this study. Recent data from France[20] unfurls the fact that 100% medical residents are fully vaccinated while 85.5% of 3rd year students in Malaysia showed the same, these proportions being undoubtedly much higher than what we found here in

Table 2: Assessment of Attitude of Medical Students about Hepatitis B and C

Question	College			Year of Study			Total
	Public	Private	p-value	Pre-Clinical	Clinical	p-value	
Should hepatitis patients be allowed to work routinely (YES)	636(67.9)	421(73.6)	0.052	439 (61.3)	618 (77.9)	<0..001	1057 (70.0)
Should hepatitis patients be allowed to do strenuous exercise (NO)	179(19.1)	193(33.7)	<0.001	114 (15.9)	258 (32.5)	<0.001	372(24.7)
Should hepatitis patients be isolated (N0)	677(72.3)	441(77.1)	0.08	491 (68.6)	627 (79.1)	<0.001	1118(74.1)
Should hepatitis patients be allowed to abandon sexual contact (YES)	541(57.7)	265(46.3)	<0.001	424 (59.2)	382 (48.2)	<0.001	806 (53.4)
After being exposed to any of the possible risk factors for hepatitis, did you consult for any post exposure treatment … yes	55(27.4)	50(35.7)	0.1	44 (34.1)	61 (28.8)	0.301	105 (30.8) 908 (60.2)
How can students be encouraged to get vaccinated?							
organizing hep seminars	565(60.3)	343(60.0)	0.898	428 (59.8)	480 (60.5)	0.765	589 (39.0)
door to door campaigning	360(38.4)	229(40.0)	0.533	306 (42.7)	283 (35.7)	0.003	1192 (79.0)
media awareness programs	745(79.5)	447(78.1)	0.529	586 (81.8)	606 (70.4)	0.006	

Table 3: Assessment of Practice of Medical Students for Vaccination of Hepatitis B and C

Question	College			Year of Study			Total
	Public	Private	p-value	Pre-Clinical	Clinical	p-value	
Are you vaccinated for hepatitis B	757(80.8)	431(75.3)	0.008	568 (79.3)	620 (78.2)	0.269	1188 (78.7)
Are you fully vaccinated (3 times)	536(70.9)	289(70.0)	0.946	364 (65.9)	461 (74.7)	0.003	825 (70.6)
Have you been screened for hep B	476(50.8)	269(47.0)	0.155	439 (61.3)	306 (38.6)	<0.0001	745 (49.4)
hep C	276(29.5)	133(23.3)	0.009	281 (39.2)	128 (16.1)	<0.0001	409 (27.1)
Which of your family members are vaccinated for hep b?.... mother	471(50.3)	306(53.5)	0.223	373 (52.1)	404 (50.9)	0.656	777 (51.5)
father	448(47.8)	297(51.9)	0.121	360 (50.3)	385 (48.5)	0.502	745 (49.4)
sibling	602(64.2)	347(60.7)	0.162	453 (63.3)	496 (62.5)	0.772	949 (62.9)
none	159(17.0)	178(13.6)	0.084	88 (12.3)	149 (18.8)	<0.001	237 (15.7)
don't know	124(13.2)	100(17.5)	0.024	134 (18.7)	90 (11.3)	<0.001	224 (14.8)
Have you ever had needle pricks	494(52.7)	259(45.3)	0.01	419 (58.5)	334 (42.1)	<0.001	753 (49.9)
Have you ever had unscreened blood transfusion	25(2.7)	17(3.0)	0.397	18 (2.5)	24 (3.0)	0.006	42 (2.8)

Pakistan. Furthermore, an Iranian study[19] showed that about 95% internists and 84% general practitioners have had complete vaccination for hepatitis B. However, the transplant surgeons in USA[9] were reported to have almost the same inadequate vaccination status as we report in this study.

The screening status for hepatitis B and C was found to be about 50% and 33% respectively with interestingly higher proportions in pre-clinical group. This percentage of hepatitis B screening is close to the study of Nisar et al[7] conducted in a private medical college of Pakistan, but quite lower than Iranian internist, dentists and Para-medical staff as reported by Kabir et al.[19] The consciousness for viral diseases and better facilities for screening could be the major reasons for this significant difference. This notion is further solidified by the fact that only 63% of respondents' siblings were

proclaimed to be vaccinated against hepatitis B. Half of the respondent students indicated that they experienced needle prick some time in their medical life. This prevalence of needle stick injury is in agreement with Akhter et al study[8] conducted on health care workers of a tertiary care hospital of Karachi. However, it is lower than other national studies.[15,21,22] Swe et al[23] has reported that all the medical students of their survey received at least one needle stick injuries during their study period. According to different studies, 11% - 50% of the undergraduate medical students were exposed to occupational sharp injuries during their study period. Furthermore, it is reported that at least 590,000 percutaneous exposures to blood and body fluid occurs yearly to the health care providers.[24]

In most of the responses, the students of clinical groups showed significantly better information than pre-clinical groups. Therefore, there is a need to increase the level of education and incorporate some chapters regarding preventive measures in the syllabus of medical education. Furthermore, the students of private medical colleges showed significantly enhanced knowledge about this clinical entity and preventive measures and better attitude towards the hepatitis B patients than the students of public institutions. In Pakistan, the number of students in the class of public institutions is significantly higher than private institutions. As a matter of fact, students entering the public institutions carry a better educational background but since the instructor to student ratio is considerably low; their knowledge was found to be hampered as compared to their private colleagues.

The study has three main limitations, 1) Although this study covers 7 out of 8 medical colleges existed at that time; nevertheless the results cannot be generalized for the medical/dental students of Pakistan. 2) The study is self-reported. Even though one study indicated that the self-reporting shown high sensitivity when dealing with vaccine coverage among elderly population.[25] Ii should be noted that the respondents are medical students. Consequently, due to social desirability of preventive health behavior could lead the respondents to over report of partial/complete vaccination doses. 3) The design of the study is cross-sectional; therefore, the study cannot provide causal relationship.

It is recommended that the students should be informed of the medico legal, ethical and clinical importance of immediate reporting after any exposure, and they should have smooth and speedy access for consultation, treatment and follow-up. In addition, chapters regarding standard procedures of universal precautions against needle stick injuries, preventive measures and basic knowledge of blood borne pathogens should be added in the early stages of undergraduate medical curriculum.

CONCLUSIONS

The study shows that the knowledge, attitude and practices of students of clinical groups are significantly higher than the students of pre-clinical groups. Furthermore, the students of private institutions carry enhanced knowledge in some respects than the students of public institutions.

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