

KNOWLEDGE AND RISK PERCEPTION OF HEPATITIS C AMONG DENTAL AND NURSING PROFESSIONALS: A CROSS SECTIONAL MULTICENTRE STUDY

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INTRODUCTION

Health care workers, medical and dental students are at occupational risk of blood-borne pathogens like hepatitis B virus, hepatitis C virus and HIV.(1) According to world health organization (WHO) about 130-170 million people are chronically infected with hepatitis C virus, with more than 350, 000 people dying from hepatitis C related liver disease each other. Accident exposure occurs when the health care professionals are in contact with blood and body fluids and it is estimated that approximately 40% of hepatitis cases in world were caused by occupational substance exposures, HCV is seven times more infectious than HIV (human immunodeficiency virus) and occur as result of percutaneous transmission of hepatitis C virus through infectious blood.(2,3) The level of risk depends upon the number of infected patients in a particular medical institute, the

level of education of health care workers (HCWs), the preventive measures undertaken by HCWs and sensitivity about asking their patients about risk behaviour for HCV. It has been reported that 50% of health care professionals in their student life suffer from needle prick injuries(4), both medical and dental professionals are at high risk of needle prick injuries.

Many persons who are positive for HCV are not aware of their disease, above all patients with hepatitis C may sometimes experience discrimination and stigmatization in the work place, by family members and by members of the community including from health care professionals and their (HCWs) willingness to treat hepatitis C positive patients.(5)

Knowledge and awareness of the clinician plays a key role in prevention of spread of infection. Kermode et al.(6) in their study found a positive correlation between information and perception of risk, knowledge of blood borne virus transmission, and universal precautions about per cutaneous injury, among HCWs. Therefore, we undertook the present study to assess the knowledge and awareness among health care professionals, of an educational institute, regarding HCV infection.

MATERIALS AND METHOD

A cross sectional study was

conducted among dental students (graduates, interns, post graduates), teaching staff and Nursing staff of a post graduate teaching institutes. Approval was taken from the Institutional Ethics Committees.

A closed-ended questionnaire was given to the participants. The subjects were informed about the design and purpose of the study and their verbal consent was obtained. Confidentiality was assured to all the respondents.

Seven questions with subparts were used to explore knowledge and awareness regarding HCV. Respondents were divided according to their year of graduation and staff category into different groups namely, BDS first year, BDS second year, BDS third year, BDS final year, Interns, Postgraduate student and dental Staff and Nursing staff.

The data collected was first tabulated as the percentage of correct answers, and further analysed for knowledge and awareness levels.

STATISTICAL ANALYSIS

Results obtained were entered in the SPSS version 16. 0 software for statistical analysis (Chicago IL USA). These results were analyzed using chi-square test. The level of significance was set at p value < 0. 005

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RESULTS

Questionnaire was distributed to 1214 participants, out of which 954 subjects responded (BDS 1st year 237, BDS 2nd year 149, BDS 3rd year 171, BDS 4th year 129, BDS Intern 51, post graduate students and dental staff 81, Nursing staff 96). With regard to correct answers, statistically significant differences were seen between the groups (Table1 and Table2).

Knowledge regarding the investigation that need to be carried out in accordance to signs and symptoms (question1: before major/minor surgery/ dental treatment, which of the following investigation do you advice?):

Results reveals that 37.98% students from BDS first year were not aware of the type of investigations that need to be carried out, when compared to 3.14% of respondents from PG&2nd, 3rd, 4th year, Intern. Statistically significant difference (<0.005) was seen between the respondents groups.

Knowledge regarding the availability of hepatitis C vaccine (question2: Is HCV vaccination available?):

22.78% of BDS Ist year, 23.80% BDS 2nd year, 26.86% BDS 3rd year, 37.20% BDS final year, 76.47% Intern, 81.45% PG & Staff, and 43.75% Nursing staff were aware

of the non-availability of vaccine against Hepatitis C. The difference between the group was found to be statistically significant (<0.005)

Knowledge regarding complication from hepatitis C infection (question3 : HCV infection can result in chronic hepatitis and liver cancers?)

In the present study 38.29% BDS Ist year, 57.14% BDS 2nd year, 54.40% BDS 3rd year, 37.20% BDS Final year, 76.47% Intern and 81.45% dental postgraduate and staff more aware of the complications from Hepatitis C. The difference between the group was found to be statistically significant (<0.005)

Table 1: Summary of knowledge and attitude level among different groups regarding HCV infection

Number of responses															
		Istyr	%	2 nd yr	%	3 rd yr	%	4 th yr	%	Interns	%	Pg's & Staff	%	Nursing	%
Total respondent		237		189		171		129		51		81		96	
Q 1	Correct	147	62.02	129	68.50	132	77.19	111	86.04	45	88.20	78	96.26	78	81.25
	Wrong	90		60		39		18		6		3		18	
Q 2	Correct	54	22.78	45	23.80	54	26.86	48	37.20	39	76.47	66	81.45	42	43.75
	Wrong	183		144		117		81		12		15		54	
Q 3	Correct	108	38.29	108	57.14	102	59.40	84	65.11	36	70.58	69	85.15	57	59.37
	Wrong	129		81		69		45		15		12		39	
Q 4	Correct	48	20.25	45	23.80	111	64.95	111	86.04	45	88.23	78	96.29	69	71.87
	Wrong	189		144		60		18		6		3		27	
Q 5	Correct	180	75.94	102	53.96	123	71.90	96	74.14	42	82.35	72	88.56	84	87.50
	Wrong	57		87		48		33		9		9		12	
Q 6	Correct	0	0	57	30.15	57	33.33	51	44.18	30	58.82	48	59.26	54	56.25
	Wrong	237		132		114		78		21		33		42	
Q 7	Correct	15	6.32	45	23.80	90	52.63	90	69.76	38	74.50	75	92.59	74	77.08
	Wrong	222		144		81		39		13		6		22	

Table 2: Showing the mean and standard deviation (SD) between the different groups regarding the correct responses.

Number of correct responses								
Q. No.	Istyr	2 nd yr	3 rd yr	4 th yr	Interns	PG's & Staff	Nursing	p value
1	147	129	132	111	45	78	78	<.001
2	54	45	54	48	39	66	42	<.001
3	108	108	102	84	36	69	57	<.001
4	48	45	111	111	45	78	69	<.001
5	180	102	123	96	42	72	84	<.001
6	0	57	57	51	30	48	54	<.001
7	15	45	90	90	38	75	74	<.001
Mean	78.86	75.86	95.57	84.43	39.29	69.43	65.43	
SD	67.81	35.95	30.57	25.89	5.35	10.45	14.94	

Knowledge regarding the risk of transmission of HCV infection to health care professionals (question 4: Are you aware of the risk of transmission of hepatitis C infection to health care professionals)

88. 23% dental intern, 96. 29% postgraduates, 71.87% nursing staff showed awareness regarding route of transmission of infection via patients compared to respondents from 20. 25% BDS 1st year, 23.80% BDS 2nd year, 64. 95% BDS 3rd year, showing a lack of awareness about the risk factors. The difference in the result was statistically significant (<0.005) between the groups.

Knowledge regarding handling of HCV patient (question 5: will you handle a patient if you are aware that the patient is already having HCV infection?)

75. 94% first year, 53. 96% 2nd year, 71. 90% 3rd year, 74. 14% 4th year, 82. 35% intern, 88. 56% PG and staff and 87. 50% nursing showed the positivity in handling patient. Statistically significant difference (<0.005) was found among different groups.

Knowledge regarding guidelines for managing HCV patients (question 6: Are you aware of the guidelines for managing HCV patients?)

30. 15% 2nd year, 33. 33% 3rd year, 44. 18% 4th year, 58. 82% intern, 59. 26% PG and Staff, 56. 26% Nursing, showed regarding the awareness of guidelines for managing the HCV patient. The difference was found to be statistically significant ($p < 0.005$).

Knowledge regarding prevention of HCV After exposure to HCV (question 7: are you aware of the guidelines to be followed after accidental exposure to HCV?)

6. 32% 1st year, 23. 80% 2nd year, 52. 63%, 69. 76% 4th year, 74. 50% intern, 92. 59% P. G and Staff, 77. 08% Nursing, showed the awareness regarding the guidelines to be followed after accidental exposure to HCV. The difference was found to be statistically significant ($p < 0.005$).

DISCUSSION

One important characteristic of root filling material is antibacterial activity on microorganisms in the endodontic space.(1) According to Canatore et al, 2004 the ideal condition for an endodontic sealer are : adequate consistency and adhesion to dentinal walls, adequate working time, capacity to produce a hermetic seal, easy handling, radiopacity, expansion at the time of set, antibacterial action, biocompatibility, insolubility in tissue fluids, to allow retreatment of the canal, do not discolour dental tissues, no antigenic action, no mutagenic action.(6)

The agar well diffusion method used in the present study is one of the most commonly employed technique for evaluation of antimicrobial activity. The prediffusion period, which consists of maintaining the inoculated culture medium at room temperature for 2 hours, is an important step for demonstrating the antimicrobial activity of calcium hydroxide-based materials, MT A-based sealers and Bioceramic sealer. The results of our study were in accordance with those obtained

by Leonardo et al (2000), who employed similar methodology.(7)

Our results revealed that all of the materials tested possessed antimicrobial activity, substantiated by the formation of growth inhibition zones in all the three sealers evaluated. The antimicrobial activity of calcium hydroxide-based materials (Apexit) may be related to ionization with subsequent release of hydroxide ions and an increase of pH levels, creating an unfavourable environment for microbial growth. It also have an anti-inflammatory property, low toxicity and osteogenic repair potential. Antibacterial effect of Apexit was also demonstrated by Sjogren et al. who put intracanal medication of calcium hydroxide in root canals of teeth with periapical pathology. They proved in their study the complete removal of *Actinobacillus actinomycetemcomitans*.(8)

The antimicrobial activity of MTA was evaluated by Torabinejad et al., who demonstrated its effectiveness against some facultative bacteria. He observed an initial pH of 10.2 for MTA, rising to 12.5 in 3h. It is known that pH levels in the order of 12.0 can inhibit most microorganisms, including resistant bacteria such as *Enterococcus faecalis*.(9)

Bioceramic based sealer have showed a potent antimicrobial activity in this study. Its antibacterial activity is primarily related to the development of the nanostructure of the calcium aluminate particles.(10) Bioceramic sealer when used along with guttapercha, it forms a hermetic seal in root canal that prevents the penetration of various

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microorganisms.(11) Zuang et al, showed that Bioceramic based sealer killed all bacteria within two minutes of contact. The authors proceed to explain that its potent anti-bacterial effect may be a combination of its high pH, hydrophilic nature and its active calcium hydroxide diffusion.(12)

The results of our study revealed that all the sealers tested possessed antimicrobial activity, as demonstrated by the formation of growth inhibition zones against *Enterococcus Faecalis*. Bioceramic (smart bio paste) produced the largest zones of microbial growth inhibition against the bacteria, while Apexit showed the least antimicrobial activity. The efficacy of MTA Fillapex was less as compared to Bioceramic but greater than Apexit during the various time interval mentioned in this study. (13)

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