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ORIGINAL RESEARCH

Prospective cross-sectional study regarding awarenss about hepatitis b and c among dental undergradutes in northern India

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ABSTRACT
An epidemiological cross-sectional study was conducted among dental colleges of Punjab. Out of total 1800 students, 840 students were included for study of Hepatitis C and 1342 students were included for study of Hepatitis B. The difference in number of students exists as the study was conducted over different time intervals for both Hepatitis B&C. the study was carried out during academic year 2018-2019.A Knowledge, attitude and practice (KAP) survey was conducted for 840 undergraduates for hepatitis C and 1342 undergraduates for hepatitis B of dental undergraduates of Punjab. The students were distributed with a validated questionnaire having 15 questions for hepatitis C and 20 questions for hepatitis B. The questionnaire contained questions related to different aspects of disease regarding awareness, transmission, awareness of spread of infection to dental health care personnel along with signs and symptoms were assessed. The vaccination status was an important part of the study. The knowledge about vaccination along with the status of it was noted to present the true stature of immunization among dental students.

Key words: Hepatitis B, Undergraduate, Dental

INTRODUCTION

The hepatitis B Virus (HBV) is a DNA virus that infects only humans was first discovered by Dr. Blumberg in 1964 and was awarded Noble Prize in 1976. It along with Hepatitis C virus (HCV) causes inflammation of liver [(1)] leading to chronic hepatitis. The condition can be self-limiting or can progress to fibrosis, cirrhosis or liver cancer. Around 170 million people are affected worldwide by infection of hepatitis C with 3-4 million new infections each year and around 8000-10000 deaths per year.

They are transmitted by parenteral and mucosal exposure to infected blood and serous fluids. Common routes of infections include mother to infant, usage infection practices, sexual contact, blood transfusion and tattooing [(2)]. The overall rate of HBsAg reported was between 2%-8% in most of studies. The carrier rate in India of 4.7% among the widely quoted figure with an estimated carrier population of 56.5 million may be an exacerbation. This data was collected by blood bank donors, including professional blood bank donors who are known to have a higher prevalence of HBV infection. Lodha et al[(3)] did a systemic review of literature of prevalence of Hepatitis B in India was 1-2%. It was estimated that point prevalence of Hepatitis B among tribals and non- tribals populations was 3.07% and 11.85% respectively and the overall prevalence was 3.70%. India has a population of more than 1.25 billion, and with an estimated prevalence of 3% HBV carrier rate[(4)]. India is likely to have more than 37 million HBV carriers [(5)]. The estimated prevalence of HCV infection in India is about 0.5%-1.5% [(6)]. Despite the low prevalence of HCV, India with its large population accounts for a significant proportion of the global HCV burden [(7)]. Approximately 12-18 million people are thought to be infected with HCV in India [(8)].

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Dental considerations-

Every health care speciality that involves contact with mucosa, blood or blood contaminated with bodily fluids should have the goals of ensuring compliance with standard precautions and other methods to minimize infection risks[9]. Dental students who work in various dental departments like Oral Surgery, Endodontics, Pedodontics, Orthodontics, prosthodontics are generally at a higher risk of occupational hazard due to lack of experience and skill in performing dental procedures during clinical period[10-11]. Dental patients and Dental Health Care Personnel (DHCP) are at a risk for infection with microorganisms that either colonize or infect the oral cavity and the respiratory tract or may be present in the oral tissues from the circulating blood [12]. Dentistry among all the other health care professionals are considered to be at highest risk of HBV exposure, with infection rate among dentists that are 3-10 times higher than general population [13-18]. In dental care settings microorganisms can be transmitted through direct contact with contaminated instruments or surfaces, splash or spray of infectious fluids or materials in the mucosa of the eyes or mouth, and by inhalation of airborne infectious agents [19]. In health care settings, needle sticks or other sharps injuries are responsible for most occupational HBV transmission. In addition, HBV has been shown to be able to survive for as much as 1 week on environmental surfaces [20]. Therefore, relapses in infection control practices and poor barrier techniques account for the remainder of transmission cases among health care workers and also may be responsible for many cases of nosocomial or patient to patient transmission [21-23].

In dental care settings, microorganisms can be transmitted through direct contact with blood, oral fluids or patient materials. Indirect contact with contaminated objects like instruments, equipment's or environmental surfaces. Contact of conjunctival, nasal, or oral mucosa with droplets eg. Spatter containing microorganisms generated from an infected from an infected person and propelled a short distance e.g. By coughing, sneezing or talking. The most common source of occupational exposures in dentistry are percutaneous injuries with sharp instruments such as cutting instruments and anaestheticneedles [24-28]. A survey of dental practitioners by the American Dental Association showed that private practitioners experience an average of 3.2 injuries per year. Approximately 50% of HCV infected individuals have HCV-RNA in their saliva [29]. In addition, there is a direct relation between presence of HCV in saliva and plasma HCV load [29-31].

It may imply that dental environment may be specially at high risk for occupational HCV transmission. However, direct or indirect blood or body fluid exposures that can inoculate HBV into cutaneous scratches abrasions burns, other lesions or on mucosal surfaces have been documented [25-26]. HCV is not transmitted efficiently through occupational exposure to blood. The average incidence of anti-HCV seroconversion after accidental percutaneous exposure from an HCV- positive source is 1.8% (range: 0% to 7%) [32-35]. Transmission rarely occurs from mucous membrane exposure to blood and no transmission has been documented from intact or non-intact skin exposure to blood[36-37]. Management of exposure: immediately after exposure the region/ wound is carefully washed without rubbing as this may inoculate the virus into deeper tissues, which are done with soap and water for several minutes. A complete detailed medical and clinical history of patients may be recorded.

Post exposure prophylaxis: all dentists should be vaccinated and immunised for hepatitis B. till date no vaccine for hepatitis C. considering the risks of infection and associated morbidity and mortality, its of utmost important that dental professionals are well aware of hepatitis B&C. All these is urgent need for HBV vaccination of all dental professionals. Therefore this study was carried out to understand the level of awareness among dental undergraduates.

STUDY

An epidemiological cross sectional study was conducted among dental colleges of Punjab. Out of total 1800 students, 840 students were included for study of Hepatitis C and 1342 students were included for study of Hepatitis B. The difference in number of students exists as the study was conducted over different time intervals for both Hepatitis B&C. the study was carried out during academic year 2018-2019.

The aim of the study was to know about the knowledge& awareness about hep. B&C. Infection amongst the students of dental colleges. To know about the status of hepatitis B immunization and reasons for not getting vaccinated among undergraduates from 1st year dental students to interns.

MATERIALS & METHODS

A Knowledge, attitude and practice (KAP) survey was conducted for 840 undergraduates for hepatitis C and 1342 undergraduates for hepatitis B of dental undergraduates of Punjab. The students were distributed with a validated questionnaire having 15 questions for hepatitis C and 20 questions for hepatitis B. Inclusion criteria: All students who were ready to fill the study questionnaire and willing to participate in study. Exclusion criteria: Those students who refused to participate were excluded from study.

RESULTS

The questionnaire contained questions related to different aspects of disease regarding awareness, transmission, awareness of spread of infection to dental health care personnel along with signs and symptoms were assessed. The vaccination status was

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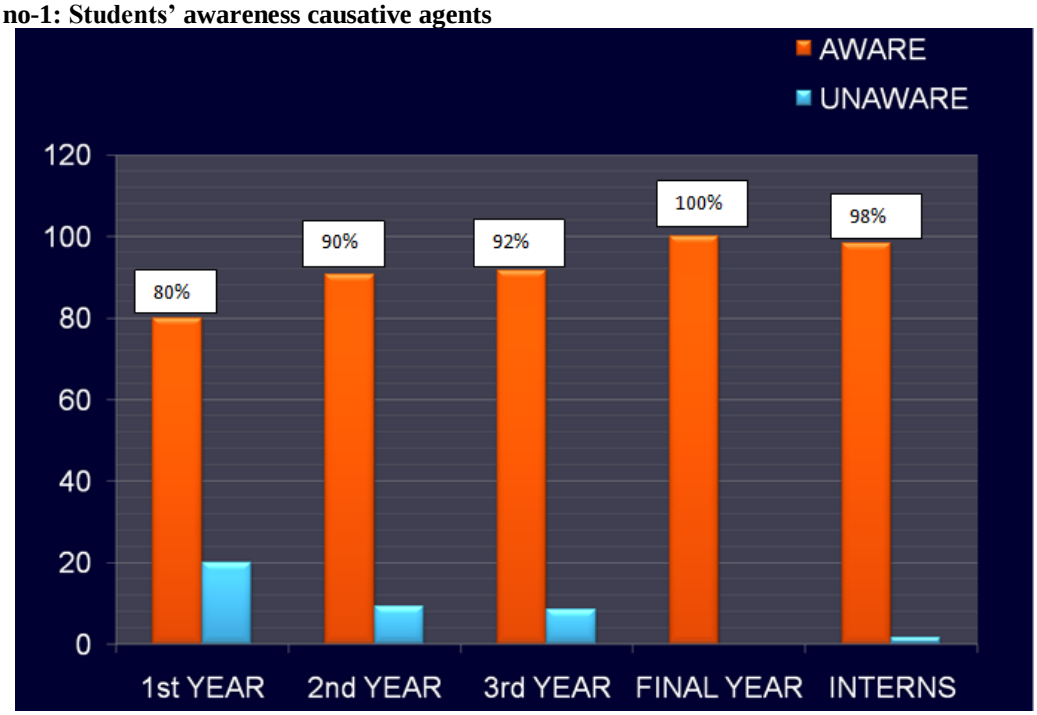
an important part of the study. The knowledge about vaccination along with the status of it was noted to present the true stature of immunization among dental students. Important reasons regarding lack of vaccination against HBV was:

- LACK OF MOTIVATION- 22.09%(1st year)<34.88%(2nd year)>12.90%(3rd year)>6.10%(final year)>4.62%(interns).
- NEVER THOUGHT ABOUT VACCINATION-29.07%(1st year)<32.56%(2nd year)<37.10%(3rd year)>34.15%(final year)<12.13%(interns).
- NO NEED OF IT-11.63%(1st year)>8.14%(2nd year)>1.61%(3rd year)>1.22%(final year).

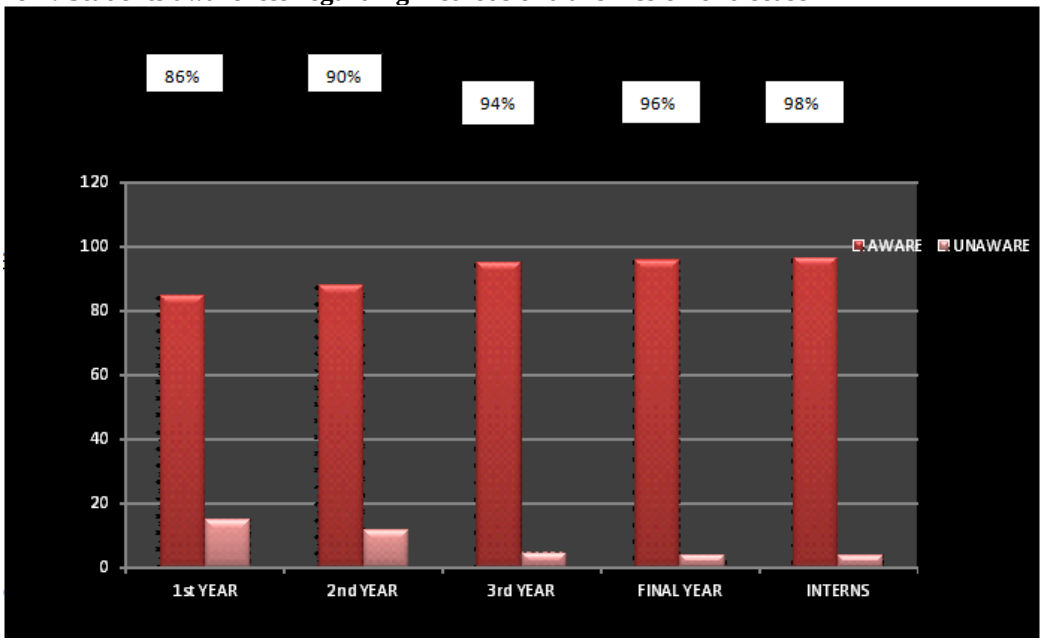
The further questions were related to hepatitis C as it a disease of which students are least aware about. Basic knowledge was tested as hepatitis C being a permanent infection along with its risk to medical and dental healthcare personnel. Moving further signs and symptoms along with its prevention measure were screened. The important question regarding hepatitis C was whether it is asymptomatic infection or not. The questionnaire as distributed among all the years with options being aware or not making the answer pattern less complicated.

STUDY RESULTS

Graph no-1: Students' awareness causative agents



Graph no-2: Students awareness regarding methods of transmission of disease



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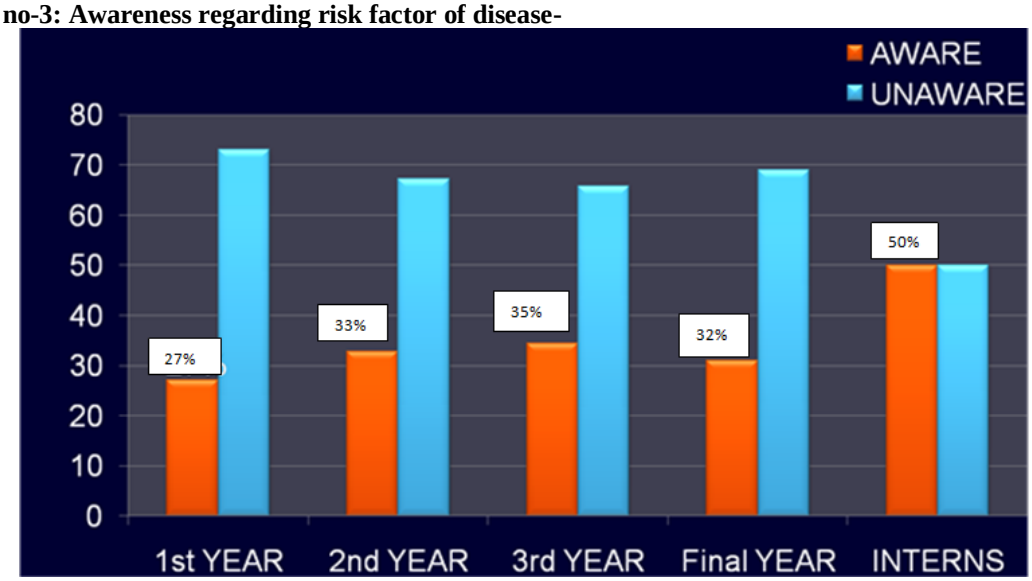
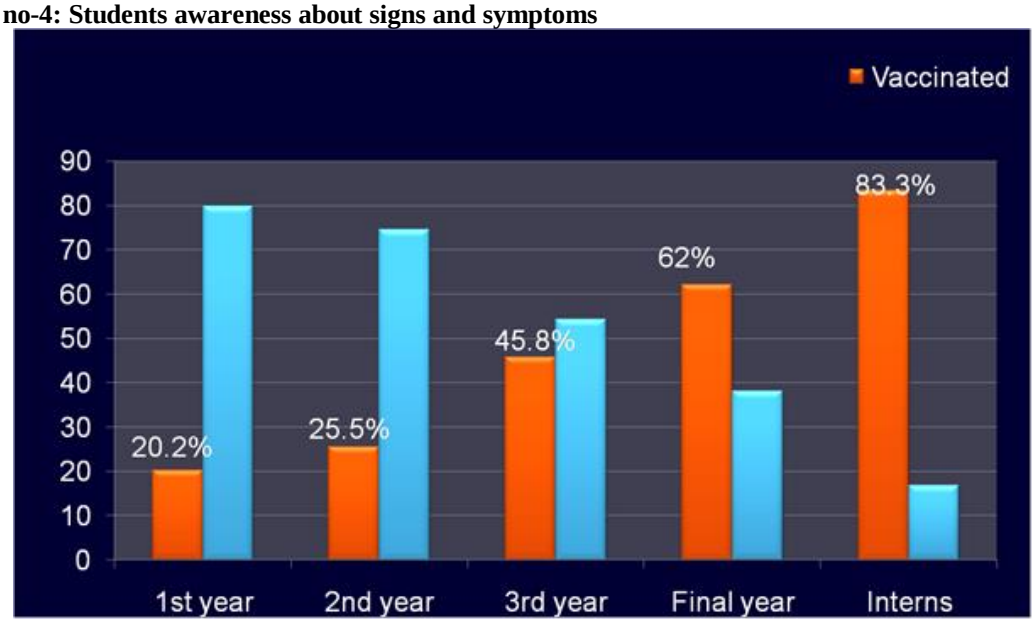
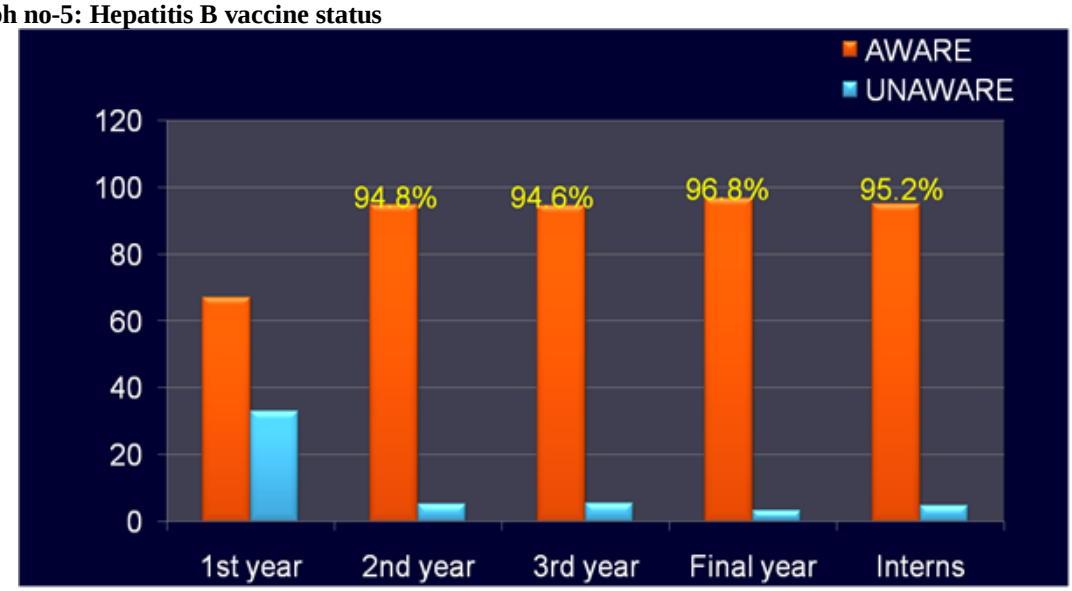
Graph no-3: Awareness regarding risk factor of disease-



Graph no-4: Students awareness about signs and symptoms



Graph no-5: Hepatitis B vaccine status



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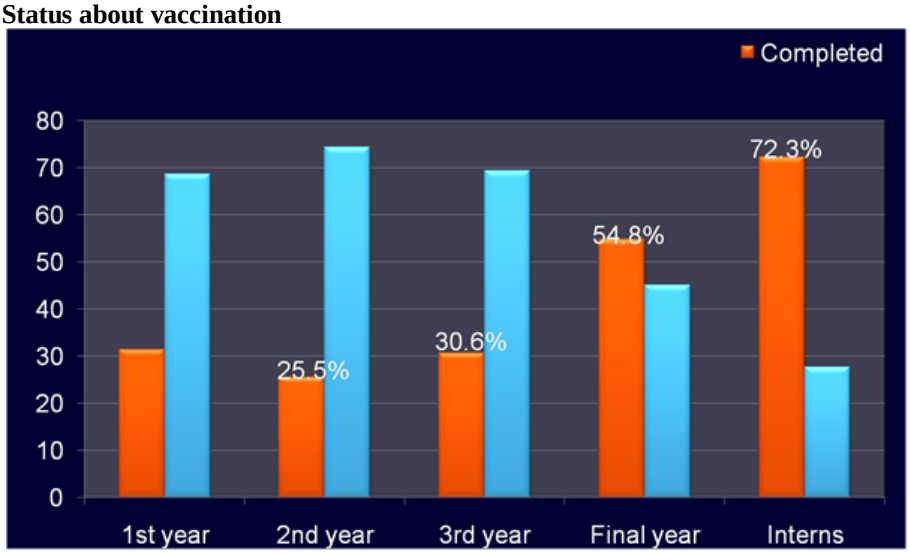
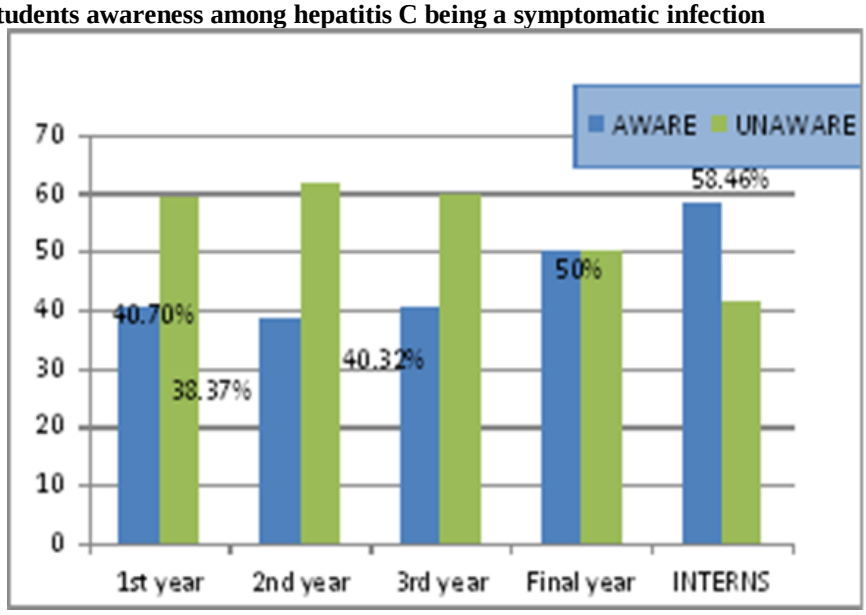
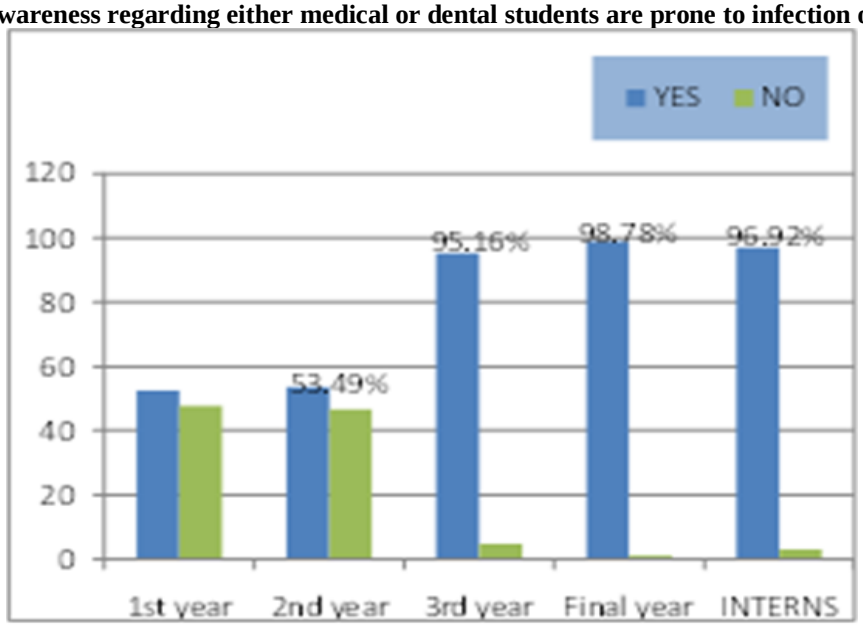
Graph no-6: Status about vaccination



Graph no-7: Students awareness among hepatitis C being a symptomatic infection



Graph no-8: Awareness regarding either medical or dental students are prone to infection or not?



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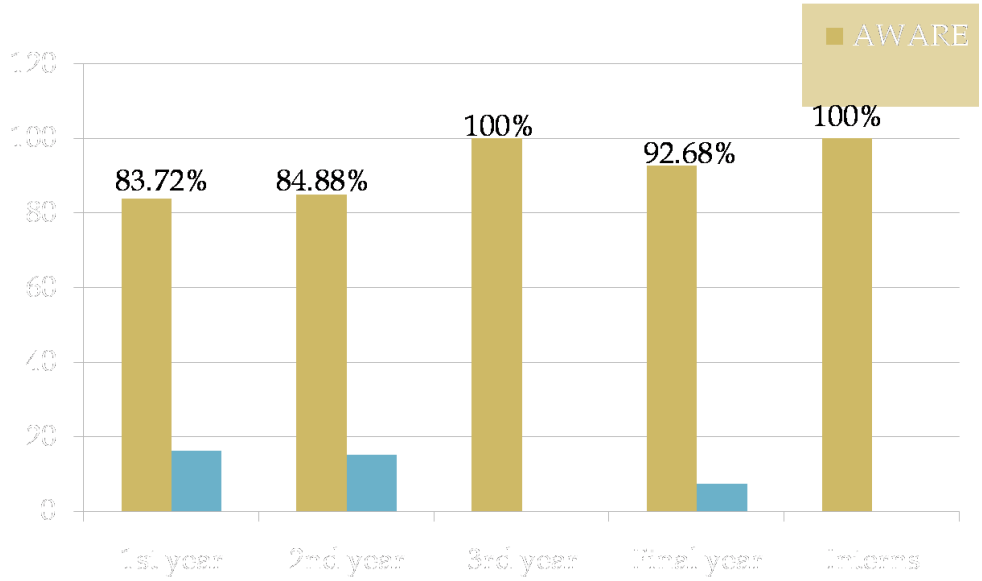
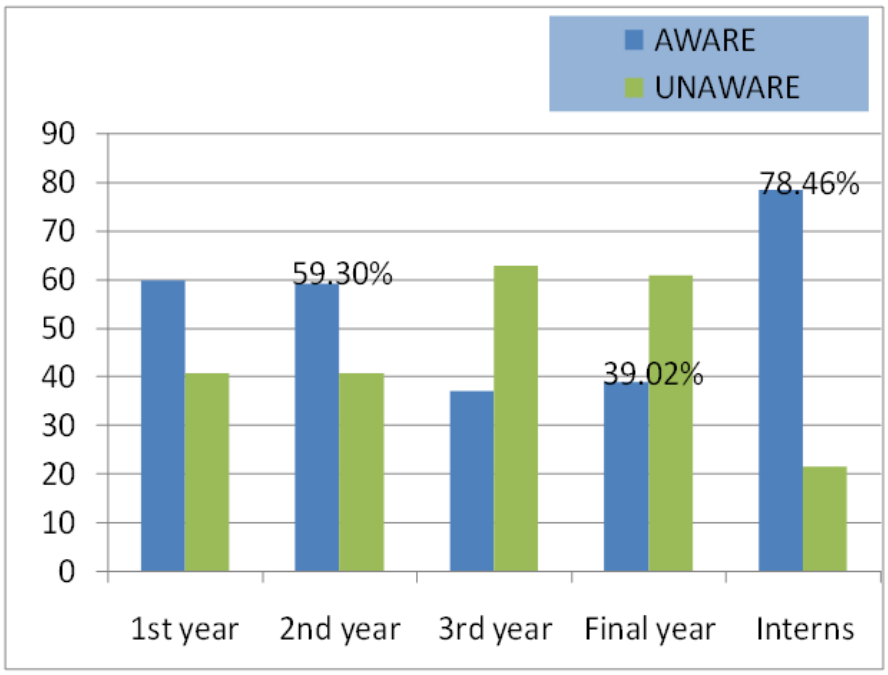
Graph no-9: Awareness regarding methods of prevention of hepatitis C-



Graph no-10: Awareness regarding hepatitis C being a permanent infection or not-



Causative agents of hepatitis B infection(Graph 1): maximum final year (100%) were aware followed by interns (98%) then 3rd year (92%), 2nd year (90%) and least by 1st year (90%) .Mode of transmission of infection(Graph 2): maximum interns(98%) were aware followed by final years (96%) then 3rd year (92%), then 2nd year (88%) and least among 1st year(84%). Student awareness about risk of spread of infection(Graph 3): maximum interns (50%)were ware followed by 3rd year(35%), then 2nd year (33%), then final year (32%), and least by 1st year (27%). Students awareness about signs and symptoms of disease(Graph 5): final year (96.8%), followed by interns (95.2%) then 3rd year (94.6%), then 2nd year (94.8%) and least by 1st year (66.8%0(graph 4). Vaccine status: maximum interns (83.3%) were vaccinated followed by final year (62%),%), then 3rd year (45.8%), then 2nd year (25.5%) and least by 1st year (20.2%). Completion of hepatitis course(Graph 6): maximum interns (72.3%)presented with completed vaccination course followed by final year(54.8%), then 3rd year(30.6%), 2nd year(25.5%)and least by 1st year (32%). Student awareness about whether hepatitis C is asymptomatic or not(Graph 7): maximum number of interns(58.46%) were aware followed by final year(50%), then 1st year(40.70%),then 3rd year (40.32%), least by 2nd year(38.37%). Students awareness about whether doctors and medical students are prone to infection or not(Graph 8):

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Maximum awareness was seen among final years(98.78%) followed by interns(96.92%), then 3rd year(95.16%) ,then 2nd year(53.49%) and then 1st year(52%). Students awareness regarding prevention of hepatitis C (Graph 9): maximum awareness was present among interns(100%) and followed by 3rd year(100%),then final years(92.68%) ,the 2nd years(84.88%) and then 1st year (83.72%). Students awareness whether hepatitis C is permanent infection(Graph 10): maximum awareness was present among interns (78.46%) followed by 1st year (60%),then 2nd year(59.30%), the final year(39.02%) and then 3rd year(37%).

DISCUSSION

Hepatitis B and C are globally dreaded infectious disease which mainly afect liver functioning ad sometimes causes irreversible liver injury. Approx. 30% of world population have been infected with hepB[38] and 3% with HepC[39]. Atleast 1 million people die annually from HBV related chronic liver disease[40]. The dental environment is associated with significant risk for HBV transmission and to a lessen degree of HCV exposure and infection. Dental Health Care personnel(DHCP) are required to receive Heaptitis B vaccination and must follow infection control strategies that are cinsistent with standard precautions to reduce the risk for hepB and C transmission. The present survey was conducted to know about awareness of hep. B and C among dental undergraduates. It was found out that each participant was aware about Hep. B&C, but their was a lot of difference of knowledge regarding risk factors of infection, status of availability of vaccine among students.

To draw comparsion between developing countries awareness with the developed nations, so awareness parallel was drawn among India and America. No significant study was found among the American Journals which shows the statistics of knowledge among medical and dental undergraduates about Hep.B & C. While in this study it was evaluated that a fair knowledge was present among Indian dental undergraduates about the diseases. 90% were aware about the caustive agents followed by 91.6% presented knowledge about transmission of disease. While a lot of misconceptions indicated lack of proper knowledge with students. Some students believed that disease might spread by animal bitting, hugging and kissing, water brone and mosquito bite. About clinical features of disease, 89.6% students were aware. Vaccination status and its knowledge was an important point. Just 47.36% were vaccinated, while 43.3% had completed their course of hepatitis B.

Moving further to Hepatitis C section, the incidence of HCV is increasing in most parts of the world especially in underdeveloped and developing countries and India is no exeption. According to government figures prevlence of HCV has been observed in Punjab, Andhra Pradesh, Puducherry, Arunchal Pradesh and Mizoram[41]. 45.57% students knew that Hepatitis C ia aymptomatic infection, an average of 79.27% students knew that medical and dental students are prone to infections. While, an average of 92.2% students knew about prevention of disease. An average of 54.75% students were aware about Hepatitis C is a permanent infection.

The present study also looked into vaccination status for Hepatitis B and demonstrated a suprising results like higher number of dental undergraduates are not vaccinated or not sure about vaccination status. It can be seen that the level of awareness increases study, higher classes like interns & final years are more aware about than of 1st,2nd& 3rd year. The study didn't measure the anti-HBS antibody level to actually measure about the immune status of the participants.

The study also included comparison with some Indian studies to provide a strong revalant base for the data proposed. This study was compared with an Epidemiological study conducted in Patiala among dental students by Vishal Malhotra etal[41]. In study by Malhotra et al[41] fair knowledge was present among participants about caustive agents which seemed to corelate with our study. About modes of transmission of disease, in study by Malhotra et al[41] 79.1% were aware which is a bit lower than our study but their were certain misconceptions which were popular among participants in both studies. It indicates lack of knowledge among the participants. While comparing clinical features of disease, 89.6% students were aware as compared to 45%[41] which seemed to be quite lower than our study and shows lack of knowledge. In study by Malhotra etal[41], 78.5% were vaccinated which was higher than our study as 47.36% were vaccinated in our study. Moving to completion of vaccination status, 67.5% completed their course in Malhotra etal[41], which presents to be higher than our study. Low percentages of vaccine status shows lesser awareness and knowledge among dental students about the importance of vaccination and the need of spread of knowledge and providing compulsory rules to be vaccinated.

The compaison of Hepatitis C was done with study conducted undergradute Dental students in Karad, Maharshtra by Priyanka M Mane[42]. In th study[42], 93.7% were aware about transmission factors which was in correlation with our study. Just 53.6% were aware about accurate signs ans symptoms[42] which was quite lower than our study which may be due to variation in study pattern. 71% were aware about vaccine along with 49.4% were about non availability of heaptitis C vaccine[42], which was in accordance with our study.

CONCLUSION

In present day, even though the study group constitutes of well educated dentalstudents were not well aware of the disease. It is vital to make dentaal students aware of gravity of disease due to close exposure of dental profession to different kinds of

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patients. Good number of these students also didn't complete their vaccination before starting clinical practice. Most were unaware of whether the vaccination was protecting them or not(sero-conversion-Anti HbS tries). It is suggested that during graduation, education programmes & campaigns on disease must be conducted. Screening programmes and CDE lectures should be conducted. Education is important as students play an important role in dissemination of knowledge & raising awareness among the communities. It is suggested that vaccination is made mandatory in dental colleges with vaccination schedule completed in 1st year of dental graduation. . Also its recommended that protection by vaccine is measured by anti-HbS titre hould be done before students complete graduation and starts dental practice.

REFERENCES

1. Robert H.Purcell. The discovery of hepatitis viruses, Gastroentrology 1993;104(4);955-963.
2. Clinics in liver disease-Feb,2010.vol.4 no.1.
3. Lodha R, Jain Y, Anand K, KabraSK, Panda CS. Hepatitis B in India. A review of disease epidemiology. Indian Pediatr. 2000;38:349-371.
4. Batham A, Gupta MA, Rastogi P, Garg S, Srrenivas V, Puliyel JM. Calculating prevalance of hepatitis B in India: using population weights to look for publication bias in conventional meta-analysis.India J Pediatr.2009;76:1274-1257.
5. Puri P. Tackling the Hepatitis B Disease Burden in India.Journal of clinical and Experimental Hepatology.Dec2014,vol.4,no.4;312-319.
6. Puri P, Anand AC, Saraswat VA etal. Consensus statement of HCV task force of the Indian National Association for Study of the Liver (INASL). Part I: status report of HCV infection in India. J Clin Exp Hepatol.2014;4(2);104-116.
7. Sievert W, Altraif I, Razavi HA, etal. A systematic review of hepatitis C virus epidemiology in Asia, Australia and Egypt. Liver Int. 2011;31(suppl 2):61-80.
8. Dhiman RK. Future of therapy of hepatitis C in India: a matter of accessibility and affordability? J Clin Exp Hepatol.2014;2(2);85-86.
9. Gallabah K, Warbuton D, Sihmbly K, Renton T. Needle stick injuries among dental studens: risk factorsand recommendations for prevention;Libyan J med 2012;7:17507.
10. Bains R, Bains VK, Kumari R. A cross sectional pilot survey of sharp injuries among dental students in a tertiary care dental hospital in Lucjnow, India. J Patient Saf Infect Control 2018;6(3):78-82.
11. Ali Hussian, M Ram, Galinde J, Jindage. Occupational exposure to sharp instruments injuries among dental, medical and nursing students in Mahatma Gandhi Mission Campus, Navi Mumbai India. J. Contemp Dent, May-August 2012;2(2)-10.
12. Kohn WG, Collins AS, Cleveland JL, etal Guidelines for infections control in dental health care settings. Morb Mort Weekly Rep 003;52(rr7);1-61.
13. Mosley JW, Edwrds VM, Casey G, etal. Hepatitis B virus infection in dentists. N Eng J Med 1975;293(15);729-743.
14. Mosley JW, White E. Viral Hepatitis as an occupational hazard of dentists. J Am Dent Assoc 1975;90:992-7.
15. Feldman RE, Schiff ER. Hepatitis in dental professionals . JAMA 1975;232:1228-30.
16. Smith JL, MayandJE, Berquist KR, etal. From the Centres for Disease Control: comparative risk of Hepatitis B among physicians and dentists. J Infect Dis 1976;133(6):705-6.
17. Hollinger FB, Grander JW, Nickel FR, etal. Hepatitis B prevalance within a dental student population. J AM Dent Assoc 1977;94;521-7.
18. Wei RB, Lyman DO, Jackson RJ, etal. A hepatitis serosurvey of New York dentists. NY State Dent J 1977;43:587-90.
19. Bolyard EA, Tablan OC, Williams WW, etal. Hospital Infection Control Practices Advisory Committee. Guideline for Infection control in health care personnel, 1998. Am J Infect Control 1998;26:289-354.
20. Bond WW, Favero MS, Peterson NJ, etal. Survival of hepatitis B viru after drying and storage for one week(letter). Lancet 1981;1:550-1.
21. Francis DP, Favero MS, Maynard JE. Transmission of Hepatitis B virus. Semin Liver Dis 1981;1:27-32.
22. Favero MS, Maynard JE,Peterson NJ, etal. Hepatitis B antign on environmental surfaces (letter). Lancet 1973;2:1455.
23. Lauer JL, VanDrunen NA, Washburn JW, etal. Transmission of Hepatits B virus in clinical laboratory areas. J Infect Dis 1979;140:513-6.
24. Cottone JA, Dillars RL, Dove SB. Frequency of percutaneous injuries in dental care providers(abstract). J Dent Educ 1992;56:34.
25. Gonzalez CD, Pruhs RJ, Sampson E. Clinical occupational bloodborne exposure in a dental school. J Dent Educ 1994;58:217-20.
26. Polish LB, Tong MJ, Co RL, etal. Risk factors for hepatitis C virus infection among healthcare personnel in a community hospital. Am J Infect Control 1993;21:196-200.
27. Siew C, Chang SB, Gruninger SE, etal. Self-reported percutaneous injuries in dentists: implications for HBV and HIV transmission risks. J Am Dent Assoc 1992;123:36-44.
28. Younai FS, Murphy DC, Kotelchuck D. Occupational exposures to blood in a dental teaching environment: results of a ten year survillance study. J Dent Educ 2001;65:436-48.
29. Hermida M, Ferreiro MC, Brral S, etal. Detection of HCV RNA in saliva of patients of hepatitis C virus infection by using a highly sensitive test. J Virol Methods 2002;101:29-35.
30. Fabris P, Infantolino D, Biasin MR,etal. High prevalance of HCV-RNA in the saliva fraction of patients with chronic hepatitis C infection but no evidence of HCV transmission among sexual partners. Infection 1999;27:86-91.
31. Belec L, Legoff J, Si-Mohamed A, etal. Mucosal humoral immune response to hepatitis C virus E1/E2 surface glycoproteins and cervicovaginal fluids from chronically-infected patients. J Hepatol 2003;37:364-9.
32. Alter MJ. The epidemiology of acute and chronic hepatitis C. Clin Liver Dis 1997;1:559-68.
33. Lanphear BP, Linnemann CC, Jr Cannnon CG, etal. Hepatitis C virus infection in healthcare workers: risk

DOI: 10.69605/ijlbpr_14.1.2025.53

of exposure and infection. Infect Control Hosp Epidemiol 1994;15:745-50.
34. Puro V, Petrosillo N, Ippolito G. Italian study group on occupational risk ofHIV and other bloodborne infections. Risk of hepatitis C seroconversion after occupational eposure in healthcare workers. Am J Infect Control 1995;23:273-7.
35. Mitsui T, Iwanko K, Masuko K, etal. Hepatitis C virus infection in medicl personnel after nedlestick accident. Hepatology 1992;16:1109-14.
36. Sartori M, La Terra G, Aglietta M, etal. Transmission of hepatitis C via blood splash into conjuctiva(letter). Hepatology 1992;16:1109-14.
37. Ippoloito G, Puro V, Petrosillo N,etal. Simultaneous infection with HIV and hepatitis C virus following occupational conjuctival blood exposure (letter). JAMA 1998;280:28.
38. Babar Rehman Fazal. Knowledge, Attitude and Practice regarding Hepatitis B&C among dental surgeons of Khyber College of Dentistry (KCD) Peshawar and Bolan Medical College (BMC) Quetta. Biomed J Sci7 Tech Res. 2017;vol.1:issue6.
39. Gayathri Monika M, Kumar Santhosh M.P. Knowledge, Awareness and Attitude among Dental Students about hepatits B infection. J. Pharma Sci& Res. Vol.8(3). 2016,168-170.
40. World Hepatitis Day. Watch out for infected needles;2013. Available http://www.health.india.com/disease-conditions/world-hepatitis-day-2013-watch-out-for-infected-needles/(accessed 15 janurary 2014).
41. Malhotra V, Kaura S, Sharma H. Knowledge, attitude and practice about hepatitis B and infection control measures among dental students in Patiala. J Dent Allied Sci 2017;6:65-9.
42. Mane M Priyanka, Patil R Satish, Ptail S Supriya, Karande G.S. Study of knowledge, Attitudes and Practices toeards Hepatitis B and C infections among Undergraduate Dental students. International Journal of Contemporary Medical Research. Volume5I Issue 7 I July 2018I ICV:77.83.