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HEPATITIS B AND C IN HEALTHCARE WORKERS: PREVALENCE, RELATION TO VACCINATION AND OCCUPATIONAL FACTORS

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ABSTRACT: Infection with Hepatitis B virus (HBV) and Hepatitis C virus (HCV) in occupationally exposed health care workers (HCWs) should be accepted as a realistic possibility. This study aimed at estimating prevalence of hepatitis B and hepatitis C virus infections among health care workers with the final goal to encourage HBV vaccination of the non-immune Indian health care worker in a tertiary hospital. A total of 219 samples were screened from November 2012 to October 2013. They were screened for the presence of hepatitis B surface antigen (HBs Ag), and anti- HCV antibodies by the third generation ELISA. The HBsAg prevalence was 1.37%. Anti-HCV antibody was not detected in any of the health care worker screened. 63.47% of health care workers were not immunised. All HCWs who were positive for HBsAg were non- immunised. A moderate HBV infection rate and low HBV vaccination coverage were found in the study. India is a tropical country still endemic for HBV infection and new strategies to promote HBV vaccinations are to be adopted.

KEYWORDS: Hepatitis B & C, Health care workers, Vaccination

INTRODUCTION: Approximately three million health care workers (HCW) are exposed to percutaneous blood each year.¹ The risk of HBV infections among HCWs is four times higher than in the general population and depends on the prevalence of HBV infected patients, nature and frequency of contact with blood and body fluids, duration of employment and immunization status. A high prevalence of these infections in the general population, the large capacity of infectious virus and daily contact with biological fluids and potentially contaminated instruments are key risk factors for HCWs for the transfer of HBV and HCV infection.² Infection with hepatitis B virus (HBV) and hepatitis C virus (HCV) in occupationally exposed health care workers (HCWs) should be accepted as a realistic possibility.³ Blood contains the highest HBV titres and is the most important vehicle of transmission in the health- care setting. HBV is relatively stable in the environment, remains viable for at least 7 days on environmental surfaces at room temperature.⁴ Screening for hepatitis B & C is still not being performed in many health setups. Due to tremendous increase in surgical workload, operation theaters could be one of the main sources of transmission of hepatitis B & C⁵. Preoperative screening for hepatitis B & C in patients is not routinely performed even for elective surgery in our country because of multiple factors and this may pose a major risk to health care workers. Major factors are, lack of public awareness about the disease, inadequate funding for health care and poor health facilities throughout the country. Whereas the literature on hepatitis B virus infection in India is growing, there is still paucity of information on HBV and HCV among HCWs. This paper contributes to this discourse by presenting the prevalence estimates for hepatitis B and hepatitis C virus infections among health care workers.

MATERIAL& METHODS: The study was carried out in department of Microbiology over a period of 1 year from November 2012 to October 2013. Serum samples were collected from all the health care

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professionals in KIMS hospital and KIDS, KIMSCON Narketpally after receiving the consent. Hepatitis B surface antigen and Anti Hepatitis C antibody tests were done by ELISA method using third generation ELISA kits (J. Mitra Industries India).

OBSERVATIONS AND RESULTS:

| Health care personnel | Number (%) |
|-----------------------|------------|
| Doctors: Faculty | 13 (5.93) |
| Post-Graduates | 25 (11.41) |
| Nurses | 60 (27.39) |
| Technicians | 27 (12.32) |
| Ayas | 41(18.72) |
| Radiology technician | 12 (5.47) |
| Dentist | 35 (15.98) |
| Clerical Staff | 6 (2.73) |
| Total | 219 |

Table 1: Sample Distribution among Health Care Personnel N= 219

Three (1.37%) out of 219 health care personnel were positive for HBsAg. Among the positives there was 1 technician, 1 nurse, and 1clerical staff. Serum samples from all health care personnel were negative for Hepatitis C antibodies.

| Occupation | HBsAg | | Anti-HCV | |
|----------------------|----------------|-------------------|-------------|-------------|
| | R n (%) | NR n (%) | R n (%) | NR n (%) |
| Physician | 0(0) | 13 (5.93) | 0(0) | 0(0) |
| Post graduates | 0(0) | 25(11.41) | 0(0) | 0(0) |
| Nurses | 1(0.45) | 59 (26.94) | 0(0) | 0(0) |
| Lab technician | 1(0.45) | 26 (21.00) | 0(0) | 0(0) |
| Radiology technician | 0(0) | 12(5.47) | 0(0) | 0(0) |
| Ayas | 0(0) | 41(18.72) | 0(0) | 0(0) |
| Dentist | 0(0) | 35(15.98) | 0(0) | 0(0) |
| Clerical Staff | 1(0.45) | 5(2.28) | 0(0) | 0(0) |
| Total | 3(1.37) | 216(98.63) | 0(0) | 0(0) |

Table 2: Relation between the occupation and rate of hepatitis B and C infection among all participants

| Vaccination | HBsAg | |
|-------------|------------|-------------|
| | R n (%) | NR n (%) |
| Yes | 0(0) | 77 (35.15) |
| No | 3(1.37) | 139 (63.47) |

Table 3: The relation between the prevalence of HBsAg and anti-HCV and Vaccination of participants

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| Study | Total no of HCW's | HBsAg Positives | anti-HCV Positives |
|--|-------------------|-----------------|--------------------|
| Abdelsalam Nail et al. ¹ | 211 | 5 (2.4%) | 0 (0 %) |
| Mirsad Cabaravdic et al ² | 3, 330 | 49 (1.47%) | 11 (0.3%) |
| Ziraba et al ³ | 370 | 30 (8.1%) | - |
| Mirza Khalil Bahmani et al ⁴ | 346 | 9(2.6) | - |
| Luiz A.S. Ciorlia et al ⁶ | 1, 433 | 11 (0.8%) | - |
| Rola I. Jadallah et al ⁷ | 52 | 05 (0.96) | - |
| Bo-Moon Shin et al ⁸ | 571 | 14 (2.4%) | - |
| Anand Kalaskar and Mahesh Kumar ⁹ | 442 | 5(1.13%) | 0 (0 %) |
| Zakaria Astal et al ¹⁰ | 399 | 11 (2.8%) | 5 (1.3%) |
| Baldo V, Floreani A et al ¹¹ | 245 | 1 (0.4%) | 2 (0.8%) |
| Duseja A, Arora L, et al ¹² | 3556 | 61 (1.7%) | (0.87%) |
| Ganju S A, Goel A. ¹³ | 200 | 5% | 0 (0 %) |

Table 4: Prevalence of HBsAg and anti- HCV in health care professionals from Various Studies

DISCUSSION: Health care personnel are at risk for blood borne pathogens like hepatitis B and C. The study was done to screen HBsAg and antibodies to hepatitis C among health care personnel by using ELISA. All the samples were collected in asymptomatic health care personnel. Three out of 219 (1.37%) health care personnel were positive for HBsAg. This is comparable with previous studies.^{1,2, 4, 5, 7, 8, 9, 12} None of the samples were positive for antibodies to HCV^{1, 9, 13}. All the above three HBsAg positive participants were not vaccinated for hepatitis B. Among these three positive cases two revealed past history of jaundice. This could be prevented by vaccination. By following strict universal safety precautions which includes vaccination against hepatitis B, transmission of these blood borne pathogens can be reduced.

CONCLUSION: Health care providers are at risk of getting hepatitis B and C and they can also become source of infection to others. Regular screening for these pathogens once in six months, in the hospitals is essential to prevent the risk of transmission of these infections to others. Early diagnosis during asymptomatic period can be made easily and proper treatment can be instituted. Sensitization programmes about universal safety precautions are to be organised regularly to all health care workers.

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