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INCIDENCE OF HEPATITIS C IN DIFFERENT PARAMEDICAL STAFF WORKING AT DIFFERENT HOSPITALS IN PAKISTAN

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ABSTRACT

Acquisition of blood borne pathogens is a potential occupational health hazard for Health care workers (HCWs) across the world. Transmissions of over 20 different pathogens have been reported in HCWs because of occupational exposure. Despite of continuous progressive

preventive measures and employment of modern medical apparatus, HCWs performing exposures prone procedures run a risk for a vast array of blood borne pathogen like Hepatitis C Virus (HCV). HCV is a predominant cause of severe pathological consequences like acute hepatitis, chronic liver diseases and hepatocellular carcinoma. The study was aimed to evaluating the Prevalence of Hepatitis C in different Paramedical Staff working at different hospitals. Results obtained helped to take measure to treat Hepatitis C infection from Health Care Workers and minimize the risk of transmission of infection. Total 71 samples were collected for study in which Doctors, Staff & Auxiliaries working in indoor, Emergency, O.T & Pathology Lab staff were included. Out of 71 samples 06 were positive for HCV on rapid device method. These positive samples were then confirmed by ELISA method by which 05 samples were reactive for HCV and 01 sample was non-Reactive for HCV. This study demonstrates that proper training of Health care workers in the medical field can be pivotal in preventing HCV and it is necessary to carry out recycling programs addressing issue of universal precautions which are:

- Disposal of laboratory infections waste material according to WHO / International Procedures.
- Proper training of Health care workers in the field of Laboratory biosafety i-e handling of infectious material, avoid exposure, proper disposal of biohazard waste and recognition of symptoms of infection or exposure.

Keywords: Paramedical Staff, ELISA, HCV, WHO, Antibodies

INTRODUCTION

Hepatitis C is a blood borne Liver disease caused by the Hepatitis C Virus (HCV) and was first identified in 1989. The disease was first identified in 1989. The disease was initially known as "Non-A, Non-B Hepatitis". The Hepatitis C virus belongs to the *flaviviriadae* family of viruses and is spread primarily through direct contact with the blood of infected individuals (Theodore and Jamal, 2006). HCV infection is a leading cause of chronic liver disease or Cirrhosis of liver. With an estimated 3 percent population of the world is currently infected with hepatitis C and approximately 170 million persons at risk of hepatitis disease (Chen and Morgan, 2006). Therefore, World Health Organization (WHO) recognized hepatitis C as a global health problem. The high prevalence of hepatitis C, and the need to understand its epidemiology, warrants global surveillance of the disease in order to determine specific health care measures for disease prevention and control. Primary

exposure to hepatitis C virus leads to an acute infection, which is usually relatively mild. Only 20-30% of infected individuals develop clinically evident acute hepatitis C in their attempt to resolve the infection. Symptoms include Jaundice, fatigue, abdominal pain and intermittent nausea (Centers for the Disease Control and Prevention: CDC, 2004).A study done by (Radziewicz et al.,2007) reviewed that Studies in Pakistan on small targeted groups including blood donors, health professionals, drug abusers and chronic liver disease patients indicate that the prevalence of hepatitis C is as high as 40%. However, literature is still inadequate to clearly reflect the overall picture due to its limitation on identifying the incidence in healthy individuals. Several studies indicate that the rate of positivity for HCV is much higher in rural areas than the peri-urban areas of Pakistan. It is worrisome to note that 66% population of Pakistan is living in the rural areas where general public either carries the burden of the disease or they are at a high risk of contracting the disease due to several malpractices and misperceptions. It includes unavailability of proper health care delivery system, unscreened blood transfusions, and lack of education, poverty, and above all, misusage of drugs (Jiwani., 2011). Thus, such alarming situation has profound implications on patients, families, health care professionals and the whole society. A study done by (Radziewicz, et al., 2007) shown that the major modes of HCV transmission in Pakistan are use of contaminated needles and instruments in medical practice, unsafe blood and blood products transfusion, intravenous drug use, face and armpit shaving with unsterilized instruments by barbers, ear and nose piercing, poor personal hygiene habits and quackery (poor medical practice by non-qualified people). The single most important cause of HCV transmission in the country is lack of proper screening of the transfusion blood (Raja et al., 2008).Another small study carried out by (Sarwar et al., 2008) indicates prevalence of hepatitis C in Pakistan as 3% (range 0.5 -31.9%) showing significant variation in areas of the country. HCV was highest in Punjab 6.7% followed by Sindh 5.0%, Baluchistan 1.5% and Khyber Pakhtoonkhwa 1.1%.

Subjects and Materials

This study was conducted in August 2014 to December 2014 in Federal General Hospital Chakshahzad Islamabad. Total 71 study subjects were selected in the research. Inclusion criteria Doctors, Staff & Auxiliaries working in indoor, Emergency, O.T & Pathology Lab were included while Employees of finance & Accounts departments, Peons & Security Personals and Drivers were excluded from study due

to minimum exposure to infection in hospital.

Sample Selection:

- Every 3rd Doctor from 40 working in Hospital. Sample Size 13.
- Every 3rd Nurse from 72 working in Hospital. Sample size 24.
- Every 3rd Medical Technician working in O.T, Lab totals 30. Sample size 10
- Every 3rd Ward boys and ayas working in Hospital total 40. Sample size 13
- Every 3rd Sanitary worker working in Hospital total 33 sample size 11.

Sample collection:

Venous blood samples were collected from Health care workers by Veiny puncture technique. Skin of venipuncture site was cleaned with 70% alcohol and allowed to dry. Using a sterile and dry needle and syringe 5cc of blood was withdrawn from a suitable vein in the arm. Blood was allowed to clot and spun at 3000 revolution per minute (rpm) for ten minutes in an electric centrifuge to obtain serum.

Determination of Anti-HCV antibodies in Health Care Workers:

Anti HCV antibodies presence were determined in blood samples of the individuals by using HCV Rapid Test Cassette in pathology (serology) department of Federal General Hospital, Islamabad. It is a chromatographic immunoassay for the qualitative detection of anti-HCV antibodies in patient's serum. Samples of all healthcare workers who are reported positive for HCV antibodies by Rapid device method were further confirmed by Enzymes liked immune Assay (ELISA).

RESULTS

Systematically 71 samples were collected from health care workers. Doctors, Staff & Auxiliaries working in indoor, Emergency, O.T & Pathology Lab staff were included in the study. Out of 71 samples 06 samples are positive for HCV on rapid device method as mentioned in table below. These positive samples were then confirmed by ELISA method by which five samples were reactive for HCV and 01 sample was non-Reactive for HCV as shown in table (table 1).From 05 HCV positive patients who were confirmed by ELISA method three were male and two were females. The gender wise distribution of reactive samples is shown in table (table 2). According to marital status of HCV positive patients three were married males and one was married female similarly from unmarried category only one patient was unmarried female. Gender wise status of married and unmarried couples is mentioned in table (table 3).On history of different reactive incidences three HCV positive patients have occupational needle

stick injury, two patients have blood transfusion, and two patients have surgical operation and no one have history of other infection like TB and AIDS. History of different reactive incidences is shown in table (table 4).

Table 1: Prevalence of HCV in examined health care worker by Rapid kit and ELISA method

S.NO	Method	Total No of Samples Examined	No of Reactive Samples (%)	No of non-reactive samples (%)	No of Borderline (%)
1	Rapid Test	71	06 (8%)	65 (91%)	0
2	ELISA Test	06	05 (83%)	1 (16%)	0

Table 2: Prevalence of HCV in examined health care worker by Rapid kit and ELISA method

S.NO	Method	Total Numbers of samples Examined	No of Reactive Samples (%)	No of non-reactive samples (%)	No of Borderline (%)
1	Rapid Test	71	06 (8%)	65 (91%)	0
2	ELISA Test	06	05 (83%)	1 (16%)	0

Table 3: Status of Married and Unmarried individuals

S.NO	Total No of Samples	Married males (%)		Unmarried males (%)		Married Female (%)		Unmarried Female (%)	
1	71	Positive	Negative	Positive	Negative	Positive	Negative	Positive	Negative
		03 (13%)	20 (87%)	0 (0%)	23 (100%)	01 (6%)	15 (94%)	01 (11%)	08. (89%)

Table 4: History of different reactive incidences

S NO	Incidence	No of Cases (Yes)	No of Cases (No)
1	Occupational Needle Stick injury	03	02
2	Blood Transfusion	02	03
3	Surgical operation	02	03
4	History of other Infections(TB,AIDS)	0	05

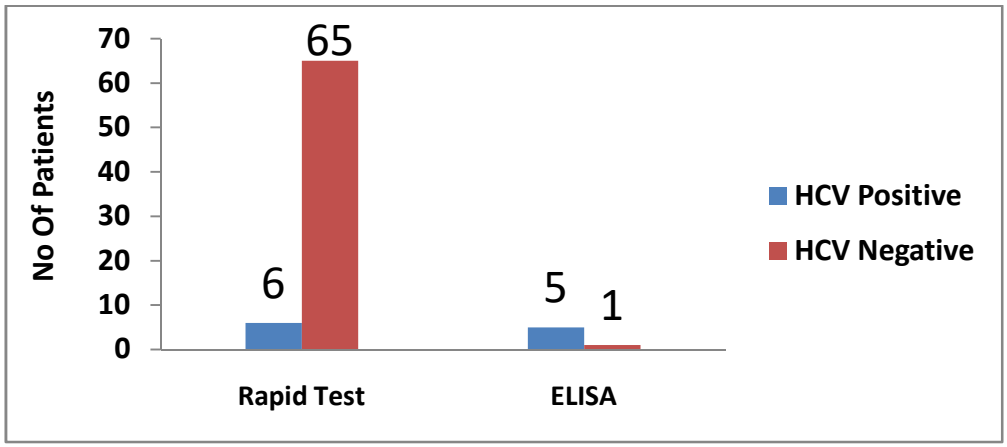

Figure 1: Prevalence of HCV by Rapid Test and ELISA method

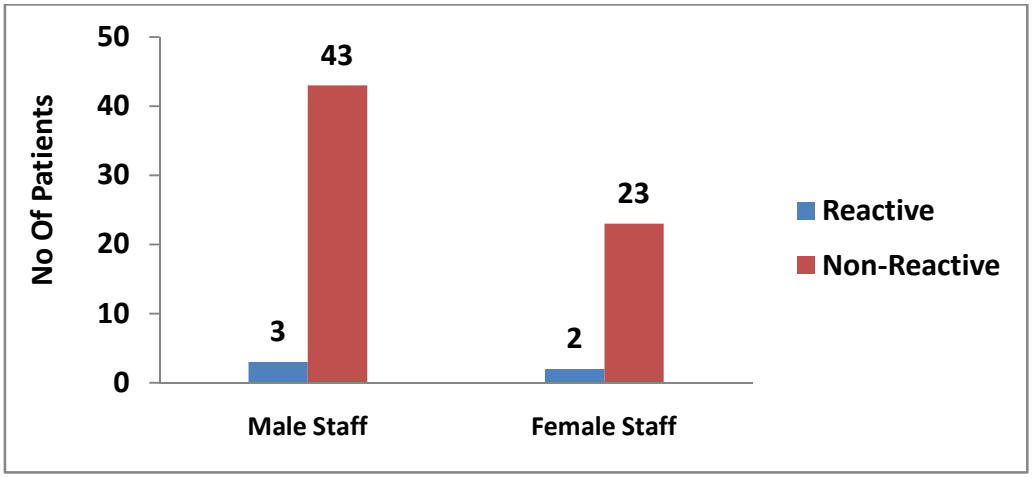

Figure 2: Gender wise distribution of all Hospital staff included in the study

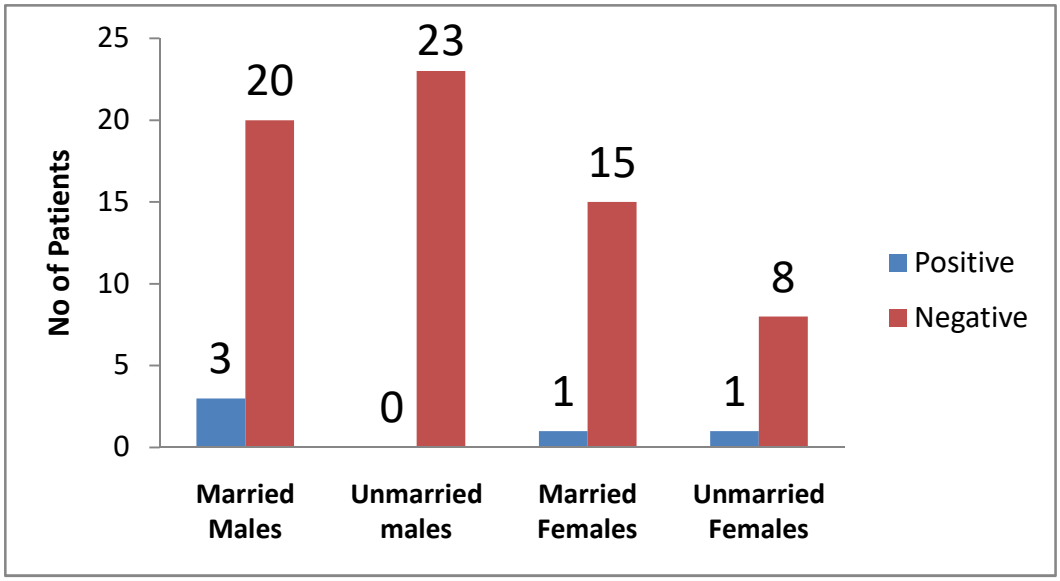

Figure 3: Gender wise status of married and unmarried couples

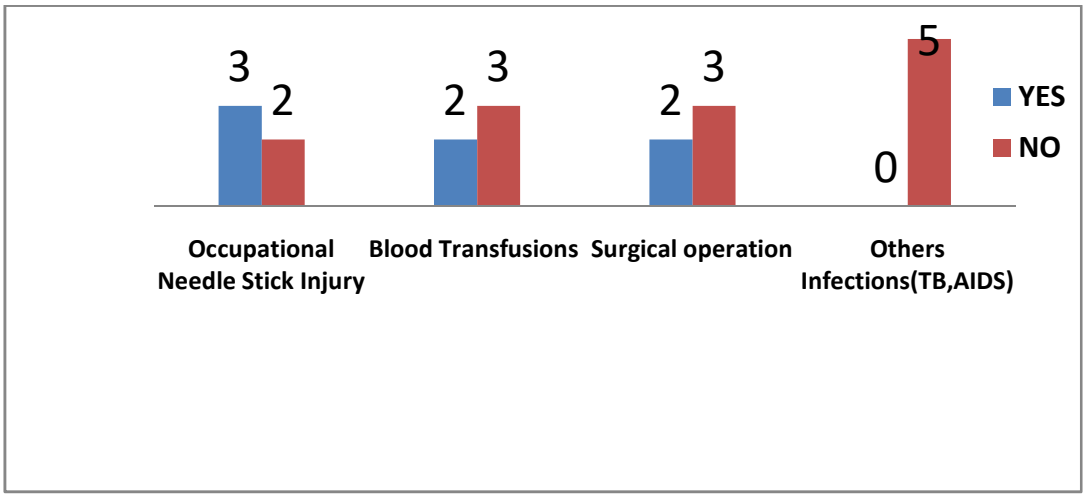

Figure 4: History of different reactive incidences

DISCUSSION

The HCV prevalence studies carried out in our country during past decades had limited geographical scope, different time frames, applied diverse methodologies, and predominantly focused on hospital based studies and high risk population groups. Despite considerable diversities and limitations, these studies reported the high prevalence of HCV, promulgating the high burden of viral hepatitis poses threat to population's health (Khan et al., 2011).In these hospitals setting of preventive measures was already inexistence, but they were improved after the identification of hepatitis as serious occupational hazard. Due to absence of good preventive measures in the past e.g. extensive reuse of non-sterilized syringes, fragile health structure, unscreened blood transfusion, use of contaminated razor by barber, general poverty and poor education, a high prevalence rate was reported in general population of Pakistan .The evidences showed that all these factors appear to have played the predominant role in occupational transmission of HCV (Kesieme et al., 2011).

Rate of seroprevalence of HCV antibodies in the general population of Pakistan have been reported as 5.31%-7.5%. In this study 7.0% anti-HCV positivity was recorded. This figure was higher to that reported from Rawalpindi (5.6% out of 250), from Karachi (6% out of 217) and from Abbottabad (5.6% out of 125) (Ali et al., 2010).The difference in high prevalence rate in this study and low prevalence in previously published literatures from diverse regions of Pakistan reflects the variation in the distribution of HCV between and within different Pakistani geographical areas, actual difference in risk at different hospitals, and the compulsion of mandatory screening of serological status of patients in these hospitals before undergoing invasive procedures (surgery/ dental), which alerts the Health Care Workers to facilitate appropriate planning during treating the infected patients. On the other hand attempts of viral screening of blood donors have markedly reduced the transfusion-related infections rate in patient population (Beyrer et al., 2010).

However, methodological differences of sampling strategies and published data of relatively small-scale surveys also contribute to these differences in seroprevalence. This study results showed that although all Health Care worker were aware about the importance of screening for hepatitis as it made aware of self-care, start therapy and also apply appropriate preventive measure during their provision of services, however there were gaps in their knowledge and practice (Brehaut et al., 2009).The absence of a prophylactic vaccine from HCV infection, the logic of

this approach would dictate that repeat and continual screening for HCV is recommended. Another malaise in our health system is the reuse of contaminated needles and equipment in health related procedure. In this study history of dental treatment, history of surgery and blood transfusion has been demonstrated to be responsible as a route of transmission of HCV. This finding verified results of the earlier studies.

Current study was in agreement with previous study that the major contributing factors towards increased HCV prevalence include unchecked blood transfusions and reuse of injection syringes in Pakistani population, as several small groups involved in recycling and repacking of used un-sterilized syringes, which were easily available in market at low cost. Screening in the long term, reduce the pool of hepatitis-infected Health Care worker performing exposure prone procedure, consequently reduce the frequency of Health Care worker to patient transmission events (Stephens et al., 2009).

As persistence of hepatitis infection has grave consequences and no satisfactory treatment is available so far, it will be fast growing gargantuan proportion if special precautions will not take to check its transmission in hospital setting. Therefore the use of preventive precautions is important tools to save themselves of this growing menace (Sambo et al., 2011). The focus was needed on the safety educational training programs to all level of Health Care worker and it should be emphasized that there is need to maintain utmost care regarding dealing with needles and sharps and caution during the in between handling also. Moreover the areas, incidences, trends, activity, procedures and occupational groups that result in a high risk of transmission of hepatitis to Health Care worker should be identified in a tactful manner, carefully analyzed and will be used to design the preventive strategies for them.

CONCLUSION/RECOMMENDATIONS

1. This study demonstrates that proper training of Health care workers in the medical field can be pivotal in preventing HCV and it is necessary to carry out recycling programs addressing issue of universal precautions which are:
2. Disposal of laboratory infections waste material according to WHO / International Procedures.
3. Proper training of Health care workers in the field of Laboratory biosafety i-e handling of infectious material, avoid exposure, proper disposal of biohazard waste and recognition of symptoms of infection or exposure.

Conflict of interest: The authors declare no conflict of interest.

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