

PREVALENCE OF HEPATITIS C AMONG FACTORY WORKERS OF GUJRANWALA (PUNJAB) PAKISTAN

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ABSTRACT:- Hepatitis C is the most prevalent viral hepatitis in Pakistan. Factory workers, having low literacy rate and poor economic background are one of the most susceptible groups of population exposed to this viral infection. Present study was aimed to know the prevalence of hepatitis C virus (HCV) infection among factory workers in a thickly populated industrial city of Gujranwala located in province Punjab (Pakistan) as there is insufficient published literature related to hepatitis in this area. Anti HCV screening was performed in 852 male subjects working in various industrial units who presented themselves as voluntary blood donors. Subjects were distributed in three groups (Age Group I: 16-25 years; Group II: 26-35 years; Group III: More than 35 years). Total prevalence rate of hepatitis C among this population was 5.16% (44/852). The prevalence in subjects of group-I was 3.10% (19/612). Highest ratio (11.38%; 19/167) was found among subjects of group-II. The prevalence rate of hepatitis C in subjects of group-III was 8.22% (6/73). Statistical analysis shows an association between age groups and catching of hepatitis C. This high seroprevalence of hepatitis C in this working class population indicated higher risk of getting this viral infection. It also indicated urgent need for creating awareness about the possible preventive measures for this population.

Keywords: Prevalence of hepatitis C, factory workers, Gujranwala (Pakistan).

INTRODUCTION

Hepatitis C is a serious public health problem. Globally there are about 170 million people having this chronic viral infection [1]. Injection needle pricking/reuse, surgical and dental procedures and unsafe blood transfusion services etc. were identified as common risk factors. Pakistan is present in region with high prevalence rates of hepatitis C virus (HCV) [2]. However seroprevalence of hepatitis C is lower in neighboring countries of Pakistan like India, Iran, Afghanistan [3]. Many studies have been reported to find the infection rate of HCV in different regions of Pakistan [4, 5, 6] but population based studies are scarce to estimate the factual incidence of hepatitis C in different cities of Pakistan [5]. Most of epidemiological studies are confined to hospitalized patient populations [7, 8]. The prevalence of hepatitis C in Pakistan is 5% and gender wise analysis showed no difference [6]. Another small study reported 3% prevalence with a wide range of 0.5-31.9% showing significant difference in different areas of Pakistan [4]. Intra provincial comparison reveals that the Punjab province, have highest prevalence of HCV (6.7%); then Sindh province (5.0%) followed by Balochistan (1.5%) and Khyber Pakhtoonkhwa (1.1 %) [8]. Gujranwala is a thickly populated industrial city within Punjab province located 744 feet above sea level. There are thousands of small & medium entrepreneurs (SME's) and a huge number of cottage industrial units of wide diversity like manufacturing of industrial machinery, motor pump, fan and washing machine industry, electric goods, soap, ball point, rubber tube, kitchen wares, metal and melamine utensils, ceramics and sanitary industry, agriculture machinery, steel and plastic industries and woolen textiles etc. [9]. Because of uncontrolled discharge of industrial effluents, the levels of environmental pollution are much higher than required standards [10]. According to national survey which was conducted by Pakistan Medical Research Council the prevalence of hepatitis C in Gujranwala was 6.3% showing that about 243000 people with HCV infection are residing in this district [6]. In one of our previous study we have reported prevalence

of hepatitis as 4.75% and hepatitis C as 2.60% among college students in Gujranwala [11]. Aslam & Aslam in 2001 reported 23.8% prevalence of hepatitis C in Gujranwala [12]. However very limited information is available at population level showing the prevalence of HCV infection in Gujranwala. People working in factories have high risk of getting this viral infection because of exposure to multiple risk factors. The present study was planned to assess the incidence of hepatitis C infection in human population working in different industries.

MATERIALS & METHODS

Collection of blood samples

Screening for hepatitis C was carried out among apparently healthy male volunteer blood donors, working in factories located in district Gujranwala (Pakistan). The blood samples were collected by certified technicians. Blood was allowed to coagulate. Sera were collected after centrifugation at 5000 rpm for 10 minutes at 4°C. The detection of antibodies against hepatitis C virus in the sera was detected using enzyme immunoassays. All procedures were performed according to informed institutional guidelines.

Enzyme immunoassay (EIA)

The hepatitis C diagnostic kit (EIA-ANTI-HCV DSI S.r.I. Italy) based on an enzyme immunoassay was used according to manufacturer's instructions for detection of IgG and IgM antibodies to HCV in human blood serum. Polystyrene stripped 96 well plates coated with recombinant antigens (*E.coli*) structurally analogous to (HCV-NS5-Ag) proteins of HCV is firstly treated with diluted serum samples and viral antibodies were captured if present, by antigens. These bound HCV antibodies were detected by adding highly specific monoclonal mouse antibodies to human IgG and IgM conjugated with horseradish peroxidase (HRP) in the second incubation period. The captured enzyme acts on chromogen generated color which is proportional to anti HCV antibodies present in serum sample, determined by ratio of OD to the calculated cut off value.

RESULTS

Screening for HCV infection was carried out on 852 male subjects. All these subjects were working in industrial units of varied nature in different capacities. The prevalence of hepatitis (B & C) in this population was found to be 9.15% (78/852) in this population with 3.99% (34/852) for hepatitis B and 5.16% (44/852) for hepatitis C. Out of positive subjects for hepatitis, 56.41% showed positive serology for hepatitis C against 3.85% who were positive for both hepatitis B and C. All the subjects were divided in three groups on the basis of age. The results are summarized in table 1. All subjects were found HIV negative. Prevalence of HCV infection among these factory workers was 5.16%. The HCV prevalence among subjects of group-I (Age between 16-25 years) was 3.1% (19/612). Highest prevalence was found among subjects of group-II (Age between 26-35 years) which was 11.38% (19/167). The prevalence of hepatitis C in subjects of group-III (having age over 35 years) was found to be 8.22% (6/73). Using SPSS, χ^2 test was used to calculate the p-value which indicated an association between age groups and getting infection of hepatitis C.

DISCUSSION

About 3% world population is positive for HCV infection. Every year about three to four million new people get infected with hepatitis C, most of them develop chronic liver diseases including hepatocellular carcinoma [13]. The goal of present study was to determine the incidence and risk of HCV infection among factory workers who presented themselves as healthy volunteer blood donors in a thickly populated industrial city of Punjab province (Pakistan). Many studies have been carried out to know the prevalence of hepatitis in different areas of Pakistan. Most of these studies are from the volunteer blood donors or based on hospital patient populations. However very limited data was available about Gujranwala district regarding prevalence of hepatitis C especially no study was found about the HCV infection in populations of people working in factories. Overall prevalence of hepatitis C in Pakistan has been reported as 4.9% [6].

Table 1. Cross tabulation of age groups and incidence of hepatitis C among factory workers

Groups	HCV Positive	HCV Negative	Total	% of HCV positive
I (17-25years)	19	593	612	3.10
II (26-35years)	19	148	167	11.38
III (Over35years)	6	67	73	8.22
Total	44	808	852	5.16

Table 2. Chi Square Test

	P-Value	Degree of Freedom	Asymo. Sig. (2-sided)
Pearson Chi Square	190738*	2	.000
Likelihood ratio	17.165	2	.000
Linear by Linear Association	12.588	1	.000
Total Valid cases	852		

*1 cells(16.7%) have expected count less than 5. Minimum expected count is 3.86

In another study the frequency of hepatitis C has been reported as 4.7%, ranging from 0.4% - 33.7% in different areas of Pakistan [13]. In Punjab province (Pakistan) the frequency of hepatitis C ranges from 1.9% to 13.1% in different regions with overall prevalence of 6.7%. In Gujranwala prevalence rate was 6.3% (58/926). This frequency of hepatitis C in Gujranwala was higher as compared to nearby districts of Gujrat (5.4%) and Narowal (4.0%) and lower than Sialkot (7.0%), Hafiz Abad (12.9%), Sheikhpura (8.7%) and Lahore (6.8%) [6]. Highest prevalence (23.8%) of anti-HCV positive serology was reported for Gujranwala [12]. Among healthy blood donors in Sialkot, 15.6% were found positive for HCV [14]. Low prevalence (0.5%) was found among college students as compared to very high prevalence (30%) among paid blood donors [15]. An overall prevalence of hepatitis was 8.34% in factory workers with 1.98% for hepatitis B and 6.35% for hepatitis C [16]. In the present study we have calculated an overall prevalence of hepatitis in factory workers as 9.15% with 5.16% for HCV. Subjects of group-I have seroprevalence of 3.10% which is less than the prevalence in the general population of the city. Subjects of group-II having age between 25 to 35 years have highest prevalence of 11.38% which is quite high as compared to general population [6]. Also prevalence rate of HCV is much higher in factory workers as compared to college students of Gujranwala which is 4.08% for hepatitis and 2.32% for hepatitis C [11]. This difference in prevalence among these two populations of the same city might be due to differences of knowledge, attitude, access to awareness programs and exposure to multiple risk factors. Studies based on blood donors usually have a limitation of underestimating true infection rate because high-risk groups are excluded as young and healthy people are likely to act as volunteer donor than elderly people; this might affect the overall prevalence rate in elder age groups (fewer subjects in group-III). Main risk factors for hepatitis infection include the use/reuse of contaminated syringe needles in medication and drug abuse and unsafe blood transfusions [4]. A study in China showed a significant association between HCV infection and extramarital sexual contacts and drug abuse [17]. An association was suggested between HCV infection and small pox vaccination among Pakistani volunteers [18]. Other

potential factors involved in hepatitis transmission include use of contaminated razors for shavings at barber shops [19]. Poor knowledge of barbers and reuse of razors have been reported for 46% of shaves [20]. Most of the factory workers belong to low income and less literate class of the society with poor knowledge about the preventive measures of the disease [16] so they are more exposed to risk factors. This indicates an urgent need for awareness campaign and establishment of better screening and treatment facilities for this important class of the society. Our results and others also indicate that a central surveillance or reporting system [2] should be established at provincial or national level to track trends in HCV infection rates in different population groups so that better ways of prevention can be devised.

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