The Nucleus **47**, No. 4 (2010) : 333-337

The Nucleus
A Quarterly Scientific Journal of Pakistan
Atomic Energy Commission
NCLEAM, ISSN 0029-5698

HEPATITIS C IN RURAL AREAS OF ISLAMABAD, PAKISTAN

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(Received May 13, 2010 and revised in accepted in revised form December 06, 2010)

Hepatitis is recognized as significant public health problem worldwide. There are one hundred and seventy five million Hepatitis C virus carriers around the world. Global prevalence ranges from 0.1 to 5 % with an average of 3 %. There are very few studies done at national and international levels to find the prevalence of HCV in our population. It is a Picorna virus that may invade the body usually through, intra venous devices and contaminated instruments. It may remain silent for years or cause acute hepatitis to chronic liver disease. Hepatocellular carcinoma is well known complication. Most of the epidemiological studies have so far been carried out on the population with high socio-economic status attending tertiary care hospitals in the cities that have good sterilization techniques. Whereas rural dispensaries are the drainage zones for HCV due to unqualified and untrained technical staff and lack of sterilization procedures. We, therefore, selected some villages (Chirah, Tumair, Thanda pani and Alipur) around Islamabad to assess the prevalence of HCV and tried to compare different epidemiological factors with urban areas in this randomized cross-sectional study conducted from May to August 2009. Two hundred asymptomatic volunteers were randomly selected from patients attending local dispensaries in this study zone. The subjects were given a detailed questionnaire to study and fill accordingly. Details of study were explained to them. Patients included in the study were between 20-50 years of age, having gastrointestinal symptoms. Excluded subjects were pregnant women, patients on ant-viral therapy and known cases of HCV. 5 cc blood samples were taken and transported in ice containers to PINSTECH Complex Hospital laboratory within two hours for chromatographic analysis. We observed that 16.5% of the individuals were infected with HCV**.** Invasive procedures like D&C by dais and ear piercing were the major transmitting factors in females, whereas I/V devices, dental treatments and barber cutting in males was the dominant risk factors. The use of non disposable glass syringes for injection was also an important mode of transmission.

Keywords : Hepatitis, Epidemiological studies, Gastrointestinal symptoms

1. Introduction

Viral Hepatitis is a major public health problem. It is one of the major blood borne infection worldwide and its carriers develop chronic hepatitis leading to cirrhosis and hepatocellular carcinoma [1]. Blood transfusions, use of contaminated syringes, haemodialysis, abortions, frequent dental procedures, are all common routes for contracting HCV [2]. Hepatitis C virus is a growing problem due to multiple causes.

It is estimated that more than 170 million people worldwide have been infected with hepatitis C virus [3, 4]. Overall prevalence in the healthy population of world is 0.01-2% [5]. The prevalence in India is 1.5% [6], Bangladesh is 2.4% [7].

In Pakistan various prevalence studies were conducted in many tertiary care hospitals mostly on healthy blood donors. Modes of transmission were accordingly assessed. Blood transfusion, surgeries, endoscopies and I/V devices were the major etiological factors in these urban areas. In pre-employment testing of anti HCV in Islamabad a total of 47538 individuals were tested and 2528 (5.31%) were positive [10]. Study carried out at Shifa International Hospital, Islamabad showed 5.31% prevalence of HCV [11]. In a community survey at Hafizabad conducted by a team of Agha Khan University Hospital, 20 out of 313 samples (6%) were found positive for HCV [12]. In 2001, Aslam et al. have reported a prevalence of 23.8% in Gujranwala [13]. Among the general population in Lahore, Amin et al. have reported a prevalence of 13.5% [14]. Modes of transmission were accordingly assessed. Blood transfusion, surgeries, endoscopies, and I/V devices were major etiological factors in urban areas tertiary care hospitals. Overall prevalence in Pakistan was

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0.44% in 1994 in healthy children [8] to 1.18% in healthy blood donors [9].

Most of the epidemiological studies have so far been carried out on the population with high socio-economic status attending tertiary care hospitals that have good sterilization techniques. In rural areas where dispensaries or primary care centers are unqualified and untrained technical staff and there is serious lack of sterilization procedures have not been studied yet This study was therefore, conducted to assess the prevalence of HCV in patients attending such hospitals/ dispensaries. These facilities existed in some villages around Islamabad (Chirah, Tumair, Thanda pani and Alipur).Most frequent sources of this infection were also assessed.

2. Materials and Method

2.1. Subjects

200 patients (Males: 74, Females: 126) were randomly selected from the dispensaries and clinics of the study zone. The study zone spreads about two km around Nilore having poor socio-economic population of about 50,000 people. A written questionnaire was filled by the trained medical staff (medical officers and nurses working in PCH) for each person after an interview with him/her. One male and one female dispenser collected the samples by due permission from the incharges of medical centers. The information recorded was seen by the volunteer who gave his willingness by putting signature/thumb impression on it. Patients were asked about age, address, education, earning, number of family members, diet. Gastrointestinal complaints like vomiting and pain in epigastrium, history of jaundice, blood transfusions, excessive use of injectables, history of ear piercing, D&C, C section in females and history of hair cutting by barber in males. Patients included in this study were between the ages of 20 to 50 years. They presented with gastro intestinal complaints for more than 6 months. Patients excluded from the study were pregnant ladies and those who received anti viral therapy within the last 3 months. Informations like type of personnel practicing, their education, and their knowledge of sterilizing techniques were also recorded.

2.2. Sampling Technique

5 ml blood was collected from each case by venepuncture and sent to PINSTECH Complex Hospital (PCH) where the serum was separated from it by centrifugation for analysis by one step rapid chromatographic immunoassay method on the same day (within one hour).

2.3 Quality of Detecting Technique

The technique applied to test the anti HCV antibodies was dot immuno chromatographic method. It is a single step technique made by ANOVA. The components are a foil pouch, a micropipette, buffer solution and its basic principle is antibody antigen reaction which determines the colour change when reaction occurs . A control was first tested to see if the system was working correctly. All the reagents were equilibrated at room temperature (15-30 ^{o}C) prior to testing. Briefly following procedure was applied:

1. Removed the test device from the foil pouch and used it as soon as possible.

2. Placed the test device on clean and level surface. Transferred 5 µl of serum of the specimen by a micropipette to the reaction wall of the test device, followed by the addition of 2 full drops of buffer.

3. Waited for the red line to appear. The result was read after 10 minutes.

Due to non-availability of funds, ELISA, an expensive technique could not be arranged. However, the manufacturer claims that the test was highly specific for antibody to Hepatitis C virus when compared with a leading commercial HCV EIA test i.e., It showed 96.8 % sensitivity, 99 % specificity and 98.9 % accuracy.

2.4. Data Analysis

Chi square test was applied to compare the prevalence between males and females. One way ANOVA was applied to compare various risk factors. Data analyzed statistically using SPSS (Statistical programme for social sciences) version 18.

3. Results

Table 1 shows the prevalence of HCV in our subjects. 33 out of 200 (16.5 %) volunteers were found positive for HCV. Comparison between males and female (Table 2) showed no significant increase of prevalence in females as compared to males ($p>0.3$).

Table 1. Observed overall prevalence of anti-HCV in rural subjects.

	Number	Percentage (%)
Anti HCV Positive	33	16.5%
Anti HCV Negative	167	83.5%

Table 2. Prevalence of anti-HCV in rural males and females.

Gender	Total Number	Number of Anti –HCV Positive	Percentage (%)
Male	74	12	16.21%
Female	126	21	16.66%

The grouping of our subjects on the basis of route of transmission in our subjects is shown in Table 3. Statistical analysis of frequencies of different sources of infection observed in our population showed that these frequencies varied significantly among different groups ($p<0.001$) and use of contaminated non-disposable glass syringes I/V devices was the most frequent route of transmission (24.5%), whereas ear piercing by the repeated use of cloth sewing needles by domestic women was the next most frequent route (15%). D&C (Dilation & Curettage) by the dais (10.5%) in females, dental treatments and barber shave cuts were also very frequently observed routes. A significant proportion of subjects were also infected through surgeries and blood transfusions. Infections through C-section, health workers and tattooing were relatively less common.

4. Discussion

The world statistics on hepatitis shows that 170 million people are infected worldwide with hepatitis C virus and this is five times as high as HIV infection and half the case of hepatitis [4, 14, 15]. The prevalence rate among the healthy population of Africa is 5.3%, Europe 1.03%, East Mediterranean 4.6%, Western pacific Union 3.9% and America 1.7 % [14]. The incidence seems to be more in developing countries probably due to limited health care services, improper sterilization techniques for medical equipments and medical malpractice. The worldwide prevalence of hepatitis C is 3.1% while in South East Asia it is 2.15% [16].

Table 3. Exposure to risk factors.

S. No.	Risk Factor	Number exposed	Percentage (%)
1	Blood Transfusion	15	(7.5%)
2	D & C	41	(10.5%)
3	Ear Piercing	30	(15%)
4	I/V Devices	49	(24.5%)
5	Surgery	13	(6.5%)
6	Health worker	2	(1%)
7	Tattooing	1	(0.5%)
8	Dental Treatment	18	(9%)
9	Barber Shave Cuts	22	(11%)
10	C- Section	5	(2.5%)

In Pakistani results of different studies vary from region to region. A study carried out at Shifa International Hospital Islamabad showed an incidence 5.3% for HCV [8]. In another study carried out on patients who underwent hemodialysis prevalence of 24% was observed [9]. Study of Lubna et al. conducted at Karachi reported 6% incidence of HCV among healthy people in Hafizabad [12] and suggested therapeutic injections as the possible source of this infection In a study on potential paid blood donors by Khattack MF et al. the prevalence ranged from 1-18% in southern Pakistan to 6.21% in northern part of province. It is estimated that about half of injections administered in Pakistan involve reused syringes [11]. Most of the quacks in our country just wash the syringes with plain water and then reuse at their illegal private clinics. It is not only the use of contaminated syringes but also the number of injections given [15] that determines the severity and frequency of infection. Blood transfusions have been considered as most important factor for transmission of HCV infection since long, even before the time, HCV screening was introduced [16]. That's why prevalence studies have been done mostly on blood donors in Pakistan. However, other sources of infections such as repeated use of contaminated syringes, barbering, D&C etc. should not be ignored. This study therefore opens new avenues of research.

Table 4. Prevalence of anti-HCV in different cities of Pakistan.

S. No.	Place	Author / year	No tested	Method	HCV positive
1	Islamabad	N. Khokhar et al. [11] 1998-2004	47,538	ELISA	5.3%
2	Islamabad	M. Umar et al. [18] 2005 meta analysis of studies un published data	79192	Different method	9.8%
3	Lahore	A. Johar [14] 2004	757	Chromatography immuno assay	13.5%
4	Bunnair NWFP	N. Mohammed [19] 2005	16400	3rd generation ELISA	4.57%
5	Hafizabad	Luby et al. [12] 1994	313	RIBA/Immuno blot	6%
6	Lahore	Aslam et al.[13] 2001	488	-----	16%
7	Gujranwala	Aslam et al.[13] 2001	1922	-----	23.8%
8	Mardan	Sheraz Akhter et al. [20] 2004	700	HCV one step test design Aclox lab	9%
9	Karachi	Abbas Hussain et al. [21] 2000	750	-----	16.24%

In our study area we found very high prevalence of HCV (16.5%) in our subjects. The observed data also shows that I/V devices and ear piercing were the most common cause of infection. The proportion of individuals infected by D&C, dental treatments and barber shave cuts were also very high. The illegal and incorrect medical practice promotes the repeated use of disposable needles and unsterilized surgical apparatus, frequent dental procedures with unsterilized instruments, D&C etc. We have found that paramedics and dais with lack of surveillance by any medical council or government institution are practicing in rural dispensaries and clinics without any medical qualifications. Most of the clinics working in this area are being operated without sterilization procedures with serious lack of knowledge about sterilization apparatus. All these need effective control by health authorities [8].

5. Conclusion

Unlawful practices of washing and reuse of contaminated syringes and surgical apparatuses is very common in our villages. Barbering, gynaecological, dental procedures, ear piercing and other invasive medical and non medical activities are also carried out under unsterilized conditions. Use of multi dose vials also support transmission of disease. Blood and other blood products are frequently infused without testing for HCV and HIV in rural dispenseries.Un-qualified paramedics and dispensers using unsterilized instruments are enhancing health hazards. This has resulted in increased incidence of HCV in our rural population.

6. Recommendation

There is a need to create awareness at public and private level about the importance of the risk factors. Government should take effective measures to control the illegal medical practice. PMDC registration of all medical practitioners in these areas should be checked in order to identify and prosecute quacks. Patients with HCV infection should be educated not to donate their blood and organs for transfusion and transplantation unless their blood samples are tested for the presence of virus. Barbers should be registered and educated on the use of sterilized razors. Awareness should also be created among the general public on the use of condoms during sexual activities to avoid any sexual transmission. Mothers with HCV should avoid pregnancy and lactation. Unauthorized dental treatments and tattooing should be dealt legally.

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