

Genotype Distribution of Hepatitis C Virus in District Jacobabad, Sind, Pakistan and the Risk Factors Associated With it

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ABSTRACT

Objectives: Our study focused on HCV's genotype distribution in district Jacobabad and its associated risk factors.

Study Design: Cross sectional study

Place and Duration of Study: This study was carried out at a Private Clinic in Jacobabad, Sind, Pakistan from January 2013 to July 2013.

Materials and Methods: 153 samples were collected and their HCV status was confirmed by PCR.

Results: Out of 153 people, 100 were male and 53 females. Majority of the people were natives of Jacobabad city (90%). Genotype 3 was the most prevalent form (80%) with 3a being the most prevalent subtype. 65% had a history of using unsterilized needle of which 3a had the highest association (87.4%). 5.5% of the subjects had received transfusions during their lifetime, with type 1 and 4 genotype having a 50% history of it. 69% had no history of sharing needles. 12.2% had a history of surgical intervention. Surgery had a 100% association with genotype 1. 2.5% had received dental treatments in the past, most evident with types 3 (65%). 61.4% had visited their barber recently. 6.3% people had ever received a tattoo, while majority of the people (92.8%) had no history of drug addiction. Reports of accidental pricks, sexual contacts or transmissions during delivery were negligible. History of tattooing, accidental pricks and transmission via sexual contact were mostly seen with type 3. No apparent cause of HCV was seen in 15%.

Conclusion: Unsterilized needles and visits to the barbers for shaving are a major risk factor for Hepatitis C in this region of Pakistan. This could be attributed to the lack of knowledge about these dangerous practices.

Key Words: HCV; genotype; Pakistan, Jacobabad, Sind; genotype distribution; risk factors

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INTRODUCTION

Hepatitis is a global public health issue and according to WHO, around 3% of the world's population is infected with Hepatitis C virus (HCV), amounting to 170 million people.¹ Pakistan is said to have a high prevalence of the disease, around 8%, which amounts to 10 million people being infected with HCV.^{2,3}

A few areas of Sind and Punjab are said to have even higher levels of Hepatitis C than the general prevalence seen in Pakistan.⁴

HCV has been classified into 6 major genotypes, from type 1-6. These genotypes differ in their response to therapy, transmission and the end result.

Currently studies about HCV genotype distribution in Pakistan are still in its early stages and those conducted primarily focus on the major cities of Pakistan.

Our study focuses on a rural area of Sind that has not been covered by any researcher so far. Through our

study we collected 153 samples, all of whom had visited our clinic in Jacobabad, Sind. Since Jacobabad lies at the junction of 3 main provinces of Pakistan and the dire need of such studies in this region highlights the importance of our research for Pakistan and this region.

MATERIALS AND METHODS

This questionnaire based cross sectional study was conducted at a private clinic in Jacobabad, Sind, Pakistan. Sind, being the 3rd largest province area wise and the 2nd largest population, with Jacobabad lying near its junction with Punjab and Baluchistan.

The study period was of 6 months that is from January 2013 to July 2013. A total of 200 people visited us during this period, out of which 153 subjects who tested positive for HCV by PCR were included in our study (76.5%). PCR was carried out by a local laboratory in the city.

The included subjects were not only the local residences of Jacobabad city but also people visiting our clinic from nearby towns and villages of Punjab and Baluchistan as well. The visiting patients included men, women and children of all age groups and religion.

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Our questionnaire was divided into 3 parts; the first one involving the person's demographic details, while the second one dealt with the current laboratory reports and investigations of the individual and the third one inquired about the risk factors.

Questions were asked and the questionnaires were filled out personally by the principal investigator himself and an informed consent was obtained prior to this.

Data entry and analysis was done using Statistical Program for Social Sciences Program (SPSS) version 17.0 and frequencies, cross tabulations and chi square test were obtained.

RESULTS

Among 153 people whom we questioned, 100 were male (65%) and 53 were females (35%). The ratio of male: female correspondents was 1.88. The mean age reported was 37.06 years with a standard deviation of 6.58. Majority of the people were natives from Jacobabad city (90 %) while a few were from Baluchistan (6%) and Punjab (4%).

The genotype frequency seen in our study had the given pattern: genotype 3 being the most prevalent with 80% followed by genotype 2 which was 15%, genotype 1 being 4% while the mixed genotype (1 & 4 and 3 & 4) making up the rest. The least frequent was genotype 4 (0%). (as shown in figure 1). In genotype 3, subtype 3a was the most prevalent form seen in around 50% of the patients followed by subtype 3b in 17% and subtype 3c in 0.5%. (Figure: I)

Out of 153 people who had tested positive for HCV, 65% the genotypes had a history of using unsterilized needle of which 3a had the highest association 87.4% which was followed by 3b with 74%.

5.5% of the subjects had received one or more transfusions during their lifetime, with those with type 1 and 4 genotype having a 50% history followed by type 2 with 34.6% and type 3 with 19.7%. Those with type 3 and 4 had no history.

69% responded no when asked about a history of sharing needles. 12.2% of the correspondents had a history of surgical interventions. In our study surgery was mostly associated with type 1 genotype (100%) then type 2 genotype (73%) followed by type 3 (65%). While 2.5% had received dental treatments in the past. An association with dental treatments was most evident with types 3 (seen in 65% of the people who had type 3) and in 50% of those with type 2 genotype.

When asked about their visits to the barber, 61.4% had visited their barber recently, while 38.6% had responded no to this question.

Only 6.3% people having HCV had ever received a tattoo, while when asked about drug addiction, majority of the people (92.8%) had no such history. Tattooing in our study was mostly seen in type 3 (15.8%) followed by type 2 (15.4%)

Almost all of those who had tested positive for HCV had no history of accidental pricks (seen in 0.2% only) or of sexual contacts or transmission from mother to child during birth (0.8%). Accidental pricks in our study were mostly seen in type 3 (3.9%) and type 2 genotype (3.8%). Another interesting fact noted was that out of all the type 3 had the highest association of sexual contact (seen in 7.9%) followed by type 2 (3.8%) and type 1 n 4 that had no association. While a few cases had no apparent cause seen in 15%. (Figure 2: Main risk factors that our subjects were exposed to).

GENOTYPES AND THEIR PERCENTAGES

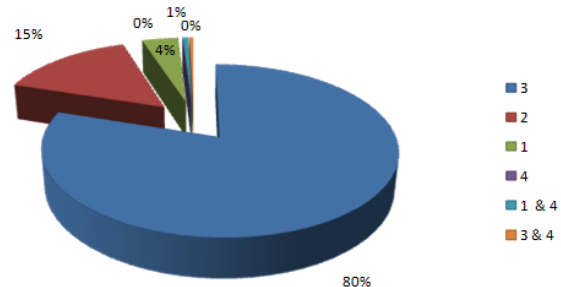


Figure No.1: Showing prevalence of different HCV's genotype in Jacobabad, Sind, Pakistan

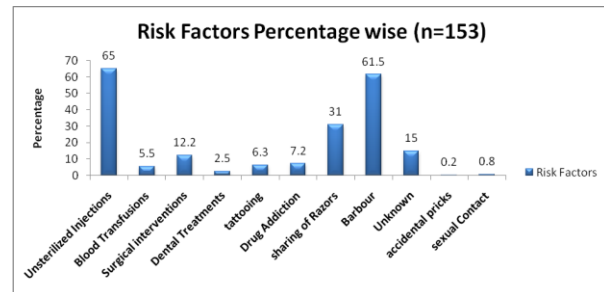


Figure No.2: The main risk factors that our subjects were exposed to

DISCUSSION

HCV which is a linear stranded RNA having positive polarity⁵ was first identified in 1989 and belongs to the Flavi group of viruses. Hepatitis C is acquired through IV needle use, razors, sharing tooth brushes, sexual contact and from the mother to child during delivery. While acute form of hepatitis C is mainly asymptomatic, it is the chronic form that can lead to the hepato-cellular cancer and cirrhosis.²

Diagnosis of Hepatitis C is made by ELISA or PCR.⁴ According to Yasir et al the main cause of transmission of hepatitis C in Pakistan is armpit and facial shaving through barbers. A similar pattern is seen in our study with unsterilized needles and arm pit shaving being the main causes of transmission. Although Pakistanis were aware about HCV but knowledge about its risk factors still seem to be low. A study conducted at a clinic in Karachi, Pakistan showed that 61% found hepatitis C to

be a viral disease and 49% felt that needles and injections are vehicles for its transmission.⁶

Worldwide HCVs prevalence in blood donors is around 0.5-8% while in Pakistan there is 9% anti HCV positivity amongst professional blood donors, 4% for healthy family donors and 8% for voluntary blood donors. A history of blood transfusion was only seen in 5.5% of our patients who had HCV.

IV drug users have the highest risk of acquiring HCV (around 90%) as also seen in our research and was the main cause of HCV in our patient population (seen in 65%). Although HCV has been found in milk and saliva but transmission via breast milk hasn't been documented yet.⁷

HCV has been phylogenically been divided into 6 major genotypes. These different genotypes have different properties, treatment responses and outcome.⁵

HCV 1a and 1b are the main genotypes found in USA and European countries.^{8,9} Japan mainly has type 1b¹⁰ while genotype 4 is found mainly in Middle East and the north African countries.¹¹ Genotype 5 is prevalent in South African while genotype 6 in Hong Kong.^{12,13}

South East Asia mostly has genotype 1 n 3. Sustained virology response is mainly predicted through HCV genotype and patients with different genotype respond differently to alpha interferon.¹

Genotype 3 was the predominant genotype in Pakistan, occurring in the highest amount in all provinces of Pakistan followed by genotype 1 in Punjab while untypable genotype in the rest of the provinces.⁵ Genotype 3 was also the most prevalent form in our study, but genotype 2 came 2nd with type 1 being 3rd.

Studies have confirmed that the form of HCV genotype prevalent in Pakistan is type 3 (75-90%) with type 3a being the main one² and 86% of those infected with 3a in Pakistan were the ones who had a history of receiving multiple injections.¹⁴

Genotype 1a and 1b are transmitted via surgeries and dental procedures, a pattern seen in our research as well while genotype 4 is not prevalent in Pakistan and is also transmitted by surgeries.¹⁴

In another study conducted by the department of zoology of Islamia College Peshawar in 2011, genotype 3 accounted for 79% of all genotypes with its rate in Punjab being 69%, Sind 77%, Khyber Pakhtunkhwa (KPK) 58% and 61% in Baluchistan. There was no difference in the HCV genotype with regards to the age and sex of the patient.⁵

In a study conducted in Baluchistan, Pakistan, 40 HCV seropositive samples from different locations in Baluchistan were selected and were genotyped. The results showed genotype 3a to be the most prevalent form.²

Idrees concluded that the only area of Pakistan where regional difference in genotype was observed was in the province of Baluchistan¹⁴

Genotype 3 being most prevalent in Pakistan does have its advantages as it has a shorter treatment duration along with it being less costly and its lack of side effects when compared to genotype 1. Genotype 1 has the 2nd highest frequency and it is along prevalent in China and Iran and may have entered Pakistan through the migration of people.⁵

Idrees also concluded in his study of 3351 samples of HCV genotype obtained from all four provinces that the frequency of genotype 1 is slowly increasing in Pakistan while genotype 3 frequency remains constant and would be in the coming decade or so be replaced by genotype 1.¹⁴

CONCLUSION

Since Hepatitis is a global public health issue and has a high prevalence in Pakistan, the general public should be made aware about its mode of transmission and its risk factors as the reuse of non sterilized syringes, poverty, lack of education, unscreened transfusions of blood, contaminated razors used by barbers are the main reasons aiding its spread inside Pakistan. Our study confirms genotype 3 and 3a to be the most prevalent genotype form and subtype seen in this region of Pakistan.

Unsterilized needles and visits to the barbers for shaving are a major risk factor for Hepatitis C in this region of Pakistan. This could be attributed to the lack of knowledge about this dangerous practice (using used syringes and contaminated blades for shaving) and local physicians and clinics in Jacobabad and adjoining areas trying to cut down on their costs while maximizing their profits.

Since studies on the distribution of Hepatitis C genotype among the Pakistani population, specially from the remote regions of Sind and Baluchistan are lacking, this research could be an important step in finding out the prevalence of Hepatitis C genotype along with its method of transmission amongst this population.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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