Hepatitis: Prevalence, Risk Factors and Associated Co-morbidities in Local Population of Karachi, Pakistan

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Abstract

Hepatitis is inflammatory condition of liver due to a viral infection which may results in acute and chronic form. Types A, B, and C are most prevalent hepatitis viruses. Frequent mode of transmission of these infections include oral, fecal and parenteral route. Hepatitis B, C and D are mainly transmitted through infected blood. Pakistan is endemic area for viral hepatitis B and C and their prevalence was estimated with 7.4 % infection rate in 2009. This population focused study with objective of monitoring of health status of local residents was carried out from February to July 2014 in Karachi, Pakistan. Data was collected (N=200) from patients and physicians using structured Questionnaire and by also reviewing medical records of subjects from various hospitals and clinics and interpreted to evaluate the risk factors, prevalence and associated comorbidities of hepatitis in local population. Rate of infection with Hepatitis C was found high (58%), followed by Hepatitis B (24%). Few cases of Hepatitis D coexisted with hepatitis B were also observed. Frequency of Hepatitis A was observed 10%. Different modes of viral transmission were also studied. Results were calculated with SPSS 20.0, using chi square and independent t-tests. It was also concluded that Hepatitis B and C infections are vital factors for causing drastic morbidity and mortality. Hence Initiation of awareness programs along with effective preventive measure is important to reduce the high prevalence of hepatitis in society.

Keywords: Prevalence; Hepatitis; Risk factors; Awareness; Mode of transmission; Karachi

Introduction

Health and literacy rate of Pakistan is below standard mark. Pakistan as a developing country is ranked 134th out of 174 countries in a report published by Human development index of the United Nations [1]. Rate of infection with hepatitis B and C is high in Pakistan as 12 million individuals are suspected to have this disease [2]. Beside these findings, In Pakistan foremost reason of acute viral hepatitis (AVH) is hepatitis E virus (HEV) mostly found in adult’s population having low socioeconomic values and fecal contamination of water is the main source for spread of this disease [3]. General features of hepatitis virus A, B, C, D and E are presented in Table 1. Factors associated with high prevalence of infections include poor regulation of health standards for transmission of blood, inappropriate use of recycled and low quality needles and syringes, non-sterilized surgical tools and dental instruments, repeated exposure of infected syringes in drug users, tattooing, nose and ear piercing and shaving using same needle or blade, haemodialysis, sexual intercourse, needle-stick injuries and peri-natal infections [4,5]. Mostly hepatitis infections are acute but B, C and D may also lead to chronic infections, associated co-morbidities, disability and death [5-8]. Substantial proportion of liver diseases is associated with hepatitis B and C virus infections. According to WHO 2004 report yearly mortalities were found 308,000 and 785,000 respectively by liver cancer and cirrhosis caused by HCV while WHO also rated Pakistan as 2nd amongst world countries having drastically high rates of chronic infectivity. About 8.6 Million Pakistanis are affected with hepatitis C [9]. Co-infections with hepatitis are not infrequent, which also present a challenge for treatment of these conditions [10]. Estimated complications of these chronic infections are expected to rise in next few decades dramatically and hence eventually burdenize the health setup of a disease with greater annual health care expenditure [11,12].

Incredible efforts are obligatory to promote awareness in public and proper education programs need to be initiated regarding risk and hazards associated with transmission of viruses [13,14]. In present work, we studied the prevalence, mode of transmissions, risk factors, associated co-morbidities and treatment available for hepatitis in local population of Karachi, Pakistan. The main purpose of this study was to assess and monitor the health status of local population with the objective to figure out the related facts for this disease.

Material and Methods

Study design

This observational descriptive study was conducted between February to July 2014 and data was collected from different areas of Karachi, Pakistan (Clinics and Hospitals). Individuals having hepatitis infections were incorporated in this study. A well-designed questionnaire was developed which consisted of 20 close-ended plus 5 open ended questions. The format of questionnaire was designed to acquire important information about the respondents’ disease type, severity and intensity, associated comorbidities, modes of transmission, and treatment protocols. Patient’s demographic data was also tabulated for disease prevalence with respect to age and sex. During this study patient medical records were studied, and their lab values for liver function test (LFT), hemoglobin and Creatinine clearance were noted down. Furthermore patients and physicians were also interviewed for their consent and involvement.

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that 100 patients were also included in this study that were admitted
then information was collected from patients and physicians. Beside
questionnaire was developed with open and close ended questions and
above 50 yrs i.e. 38% (Table 2). For collection of the data structured
calculated that one year increment in patient age can increase the risk
disease with factor of 1.034 times, while increment will double with
calculated that 100 cases from tertiary care hospitals were also
17. Effect of age and sex in relevance to hepatitis was assessed in
20 yrs (12.5%), 21-30 yrs (21%), 31- 50 yrs (28.5%) and above 50 yrs
sample N=200. Patients were divided in four age groups including 12-
local population of Karachi, Pakistan and was comprised of convenience
Hepatitis is becoming a serious health issue of developing countries,
and professional engaged to healthcare setup to signify the dominance
of hepatitis in society [15-17]. However, mass awareness is still needed
related to effective execution of the vaccination plan. Disease prevalence
disease E 12% and low prevalence of Hepatitis D i.e. 4% (Figure 3).
epidemics especially in hot and rainy periods [19,20]. Frequency of
hepatitis A virus. In Pakistan hepatitis A is present pandemic to
causes and spread of disease. Respondents rated drug users with
vaccination can also decline the age related burden of
4.6 to 23.8 % [23,24]. While high Prevalence in Africa and Asia is also
related to spread of disease is also important to commence. Routine
childhood vaccination can also decline the age related burden of
in different wards of tertiary care hospital and were also grouped
in further six categories according to the severity of disease and
admissions in different wards (Figure 1). Record of patients admitted
in various wards of tertiary care hospitals having Hepatitis A, B, C, D or E is also presented in Figure 2.

In the present study the frequency of hepatitis A was found 10 %.
Personal and public hygiene critically influence the epidemiology of
hepatitis A virus. In Pakistan hepatitis A is present pandemic to
epidemics especially in hot and rainy periods [19,20]. Frequency of
hepatitis B in this study was estimated to be 24 %, hepatitis C 58%,
hepatitis E 12% and low prevalence of Hepatitis D i.e. 4% (Figure 3).
Adult groups are more prone to be effected by HEV. Different authors
also reported small epidemics of hepatitis E in Pakistan [21,22]. The
decrease in frequency of hepatitis B in contrast to Hepatitis C may be
related to effective execution of the vaccination plan. Disease prevalence
of hepatitis C in Pakistan was also reported in different studies between
4.6 to 23.8 % [23,24]. While high Prevalence in Africa and Asia is also
reported by number of authors [25-27]. Comprehensive strategies need
to develop and implement to reduce the disease transmission with
vaccination campaigns. Communities counseling and education with
respect to spread of disease is also important to commence. Routine

Present study was aimed to determine the prevalence of hepatitis in
local population of Karachi, Pakistan and was comprised of convenience
sample N=200. Patients were divided in four age groups including 12-
20 yrs (12.5%), 21-30 yrs (21%), 31-50 yrs (28.5%) and above 50 yrs
(38%). Effect of age and sex in relevance to hepatitis was assessed in
different studies. Ghias and Khalid also indicated the impact of age
and independent sample t tests using SPSS 20.0

Result and Discussion

Hepatitis is becoming a serious health issue of developing countries,
including Pakistan. Great numbers of research studies are performed with
various cohorts of population including drug users, blood donors,
and professional engaged to healthcare setup to signify the dominance
of hepatitis in society [15-17]. However, mass awareness is still needed
about the spread, symptoms, severity, treatment and prevention of this
disease with associated morbidity and mortalities [18].

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related to effective execution of the vaccination plan. Disease prevalence
of hepatitis C in Pakistan was also reported in different studies between
4.6 to 23.8 % [23,24]. While high Prevalence in Africa and Asia is also
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to develop and implement to reduce the disease transmission with
vaccination campaigns. Communities counseling and education with
respect to spread of disease is also important to commence. Routine
childhood vaccination can also decline the age related burden of
hepatitis.

During the study patient and physicians were asked for the main
causes and spread of disease. Respondents rated drug users with
common syringes (41%), transfused blood (24%), infected equipment
(12%), followed by tattooing and ear piercing (6%), while 17% was
found with unknown causes (Table 3). Around 350 million HBV
positive cases were estimated in 2004 worldwide and over 10% in Asia.

<table>
<thead>
<tr>
<th>Type</th>
<th>Transmission</th>
<th>Classification</th>
<th>Genome</th>
<th>Antigens</th>
<th>Incubation period</th>
<th>Chronicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAV</td>
<td>Enteric</td>
<td>Picornavirus</td>
<td>+ssRNA</td>
<td>-</td>
<td>15–45 days</td>
<td>No</td>
</tr>
<tr>
<td>HBV</td>
<td>Parenteral</td>
<td>Hepadnavirus</td>
<td>+dsDNA</td>
<td>HBsAg, HBeAg</td>
<td>45–160 days</td>
<td>Yes (common)</td>
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<tr>
<td>HCV</td>
<td>Parenteral</td>
<td>Hepacivirus</td>
<td>+ssRNA</td>
<td>Core antigen</td>
<td>15–150 days</td>
<td>Yes (common)</td>
</tr>
<tr>
<td>HDV</td>
<td>Parenteral</td>
<td>Delta virus</td>
<td>–ssRNA</td>
<td>Delta antigen</td>
<td>30–60 days</td>
<td>Yes - with hepatitis B</td>
</tr>
<tr>
<td>HEV</td>
<td>Enteric</td>
<td>Hepivirus</td>
<td>+ssRNA</td>
<td>-</td>
<td>15–60 days</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: HAV (hepatitis A virus), HBV (hepatitis B virus), HCV (hepatitis C virus), HDV (hepatitis D virus), HAV (hepatitis E virus)

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<table>
<thead>
<tr>
<th>Age Group</th>
<th>Total</th>
<th>Female</th>
<th>Male</th>
</tr>
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<tbody>
<tr>
<td>12-20</td>
<td>25</td>
<td>12.5</td>
<td>10.7</td>
</tr>
<tr>
<td>21-30</td>
<td>42</td>
<td>21.0</td>
<td>24.7</td>
</tr>
<tr>
<td>31-50</td>
<td>57</td>
<td>28.5</td>
<td>29.0</td>
</tr>
<tr>
<td>Above 50</td>
<td>76</td>
<td>38.0</td>
<td>35.4</td>
</tr>
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</table>

Table 2: Age and Sex Distribution of Study Samples of Hepatitis.

<table>
<thead>
<tr>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
<th>No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>5</td>
<td>26</td>
<td>8.5</td>
<td>19</td>
<td>6.5</td>
</tr>
<tr>
<td>19</td>
<td>6</td>
<td>16</td>
<td>5.3</td>
<td>13</td>
<td>4.3</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>13</td>
<td>4.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: General Features of Hepatitis Viruses.

<table>
<thead>
<tr>
<th>No. of Cases</th>
<th>CCU</th>
<th>General</th>
<th>Gastro</th>
<th>ICU</th>
<th>MICU</th>
<th>Surgical</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>26</td>
<td>19</td>
<td>16</td>
<td>13</td>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1: Severity of Disease.
In various studies different mode of transmissions mainly drug abuse by injections, unprotected sex and transmission during childbirth were supposed to be the primary factors for spread of disease [28-30]. In another study rate of spread of hepatitis C was found 3-4 million per year [31]. Important labs finding including bilirubin aspartate aminotransferase (AST or SGOT), alanine aminotransferase (ALT or SGPT), hemoglobin and Creatinine values of respondents having viral hepatitis were presented in Table 4. These were extracted by reviewing the patient’s medical records. These lab values were used in determining the disease intensity and rationale prescribing of medications. Normal range of total, direct and indirect bilirubin in adult’s is found in order of 0.0-1.4 mg/dL or 1.7-20.5 mcmol/L, 0.0-0.3 mg/dL or 1.7-5.1 mcmol/L and 0.2-1.2 mg/dL or 3.4-20.5 mcmol/L. higher levels of these factors indicates the progression or development of hepatitis, cirrhosis and other liver diseases [32,33]. The customary values of aspartate aminotransferase (AST or SGOT) and alanine aminotransferase (ALT or SGPT) are ranged between 5 to 40 and 7-56 units per liter of serum. In case of liver injury due to hepatitis or other conditions levels of these enzymes change in blood and indicate the liver damage. Like in case of hepatitis A, very high levels of AST and ALT even in 1000U/L may found while in other cases including infection with HCV and other chronic liver diseases slight elevation of these enzymes can occur. Hence, these enzymes are not used as sole indicators to forecast the liver damage [34-36].

The most prevalent comorbidities of viral hepatitis were also

<table>
<thead>
<tr>
<th>Modes of transmission</th>
<th>Percentage of prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syringes</td>
<td>41</td>
</tr>
<tr>
<td>Transfused Blood</td>
<td>24</td>
</tr>
<tr>
<td>Tattooing/ear and Nose piercing</td>
<td>6</td>
</tr>
<tr>
<td>Infected Equipment</td>
<td>12</td>
</tr>
<tr>
<td>Unknown Reasons</td>
<td>17</td>
</tr>
</tbody>
</table>

Table 3: Respondents Knowledge about Modes of Transmission.
observed in present study and shown in Table 5. Chi-square test with 0.05% confidence Interval was used to evaluate the significant values of these comorbidities in patient samples and multiple conditions were found significant in different age groups of patients (Table 6). It was also observed that most of the patients suffered with coupled of comorbid symptoms. In previous studies associated co-morbidities of hepatitis C were also studied and cirrhosis, hepato-cellular carcinoma, and co-infection with HIV were most prevailing with annual deaths rates from 10,000 to 20,000 [37,38]. Prevalence of hepatitis in local population is also estimated with respect to gender by independent t-test using SPSS 20.0 (Tables 7 and 8). Available treatments for hepatitis were also recorded from patients profile and summarized in Table 9.

Conclusion

There is low awareness in community about the risk factors and associated co-morbidities of viral hepatitis. As treatment is costly, so preventive measures should be signified and more awareness for safer blood transfusions, importance of blood screening procedures,
References

28. Center of disease control (CDC) (2008) Chapter 4 - Hepatitis, Viral, Type C - Yellow Book, CDC Health Information for International Travel.