

# FREQUENCY OF HEPATITIS B, HEPATITIS C AND HUMAN IMMUNODEFICIENCY VIRUSES IN INTERNALLY DISPLACED PERSONS OF SOUTH WAZIRISTAN, PAKISTAN

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## ABSTRACT

**Objectives:** To investigate the burden of hepatitis B, hepatitis C and human immunodeficiency virus and to explore route of transmission in internally displaced persons of South Waziristan.

**Methodology:** A cross sectional study was carried out in Gomal Medical College, Dera Ismail Khan; Mufti Mehmood Teaching Hospital Bannu and Basic Health Unit Zaferabad, Dera Ismail Khan. Total 300 internally displaced persons (IDPs) of South Waziristan who were undiagnosed and presented with non-specific symptoms were included in the study. The data was analyzed in SPSS version 16. Confidentiality of subjects was ensured.

**Results:** In this study 300 IDPs were screened for HBsAg, anti-HCV and anti HIV antibodies. Out of which male were 190 and female were 110. More males were suffering from hepatitis B (10.3%) than hepatitis C (6.7%) or HIV (0.7%) as compared to females (3.3%), (5%) and (0.3%) respectively. A total of 5(1.7%) cases had history of previous surgery and 17(5.7%) had history of tooth extraction.

**Conclusion:** The frequency of HBV was higher as compared to HCV and HIV infections. The frequency of all the three infections was comparatively more in males as compared to females. Most likely Most likely risk factors for acquisition of infection were unhygienic tooth extractions, unsafe blood transfusions and iatrogenic.

**Key Words:** Internally displaced persons, Hepatitis B virus, Hepatitis C virus, Human immunodeficiency virus

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## INTRODUCTION

South Waziristan is a mountainous region, located in northwest of Pakistan in Federally Administered Tribal Area (FATA). As a result of military operations, thousands of residents of the conflict-affected areas escaped to neighboring districts, particularly Dera Ismail Khan (DI Khan) and Tank in the southern area of Khyber Pakhtunkhwa<sup>1</sup>.

Hepatitis A and E viruses are transmitted mainly by faeco-oral route, while Hepatitis B, C and D viruses are transmitted primarily by blood and blood products through parenteral route. It can also be vertically transmitted which is from mother to child<sup>2,3</sup>. Chronic liver disease, cirrhosis of liver, hepatocellular carcinoma and fulminant hepatitis are consequences of hepatitis B

and hepatitis C. HBV causes 563,000 deaths and HCV cause 366,000 death annually<sup>4</sup>. Hepatitis B and C are transmitted through transfusion of blood and blood products, unsterilized needles/syringes particularly by I/V drug abuser, dental procedures, scissors / razors in barber shop, piercing of nose and ears and fluid secretions e.g. saliva, semen<sup>5</sup>. In South East Asia, transmission is mainly through vertical route during parturition from mother to child<sup>6</sup>. Tattooing and acupuncture are also contributing factors<sup>7</sup>. Mostly carriers are symptomless and are silent spreaders of transmission to hospital staff through needle prick and also to other patients through surgical procedures because of lack of routine screening for HBV and HCV in many healthcare outlets<sup>8-10</sup>. In kidney dialysis patients the prevalence vary by re-using of unsterilized equipments on patients and along with it sharing of multi-dose vials and failure to change gloves

when moved from one patient to another. Other percutaneous routes like use of shared razors by barbers also result in spread of HCV<sup>11</sup>. HCV infection progresses to a chronic state in 60-85% of infected people and may develop into liver cirrhosis and hepatocellular carcinoma after 20-35 years<sup>12</sup>. Hepatocellular carcinoma is a complication of HCV infection but rarely develops within 15 years. In cirrhotic patients liver failure may also develop. Hepatic encephalopathy, variceal hemorrhage or ascites may be late manifestations<sup>13</sup>.

Globally, highest prevalence rate of HCV is in Africa and Asia, while low prevalence rate is in Europe, Australia and North America<sup>14</sup>. The prevalence of HCV is distributed as low, intermediate and high. Egypt has a high prevalence of HCV infection (17-26%) along with Hubei and Mongolia<sup>15,16</sup>. Pakistan has the second highest prevalence rate of hepatitis C ranging from 4.5% to 8%<sup>17</sup>. 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<sup>18</sup>.

The retrovirus which termed as human immunodeficiency virus known as HIV-1 was identified as causative agent of acquired immunodeficiency syndrome (AIDS) which in recent time emerged as devastating infection<sup>19</sup>. HIV-1 spreads through sex, parenteral route and through blood and blood products<sup>20</sup>. This HIV-1 infected about 60 million people worldwide<sup>21</sup>. The RNA genome consists of seven genomic structural elements including: LTR, TAR, RRE, PE, SLIP, CRS and INS. The genes which are eleven in number include; gag, pol, env, tat, rev, nef, vif, vpr, vpu, vpx and tev<sup>22</sup>. HIV starts its life cycle by attaching the CD receptor, enter the cell and attach to RNA of the host cell which eventually gets transformed into provirus. When the provirus receives the signals to be active, they use host cell RNA polymerase to make messenger RNA<sup>23</sup>.

In 2009, Switzerland topped the world's HIV epidemics with a 26% prevalence among adults aged 15-49 years and South Africa was the country with the world's largest population of people living with HIV (5.6 million). Within eastern and southern Africa, HIV prevalence has now stabilized and there is evidence of a recent decline in incidence in some countries<sup>24</sup>. The current study was conducted to examine the IDPs with respect to hepatitis B, hepatitis C, and HIV status which are prevalent in Pakistan.

## METHODOLOGY

A cross sectional study was carried out in Gomal Medical Collage, Dera Ismail Khan; Mufti Mehmood Teaching Hospital Bannu and Basic Health Unit Zaferabad, Dera Ismail Khan. Total 300 IDPs of South Wa-

ziristan who were undiagnosed and presented to the medical ward of aforementioned hospitals with non-specific symptoms like fever, lethargy and malaise were included in the study. All the subjects were adults of age more than 18 years. Along with other routine basic laboratory investigations (BLIs), blood samples were taken from subjects in the Pathology Department of Gomal Medical College, Mufti Mehmood Teaching Hospital and Basic Health Unit Zaferabad after taking proper informed consent and assuring confidentiality of subjects. 5ml whole blood was taken in a disposable syringe, allowed to clot and centrifuged at 3,000 RPM for 5 minutes. The sera separated were tested for HBV surface antigen, anti-HCV antibodies and anti-HIV antibodies using immuno chromatographic technique (ICT) and all positive samples were confirmed using enzyme linked immunosorbent assay (ELISA), ABBOT (Germany), as per manufacturer's instructions and as described elsewhere<sup>25,26</sup>. Sera were stored in a refrigerator at 4°C.

A pre-coated 96 well micro-titer plate was used for the detection of antigens or antibodies in the sera. Change in colour after reaction was detected photometrically. Both positive and negative controls were run for quality assurance. Cut off for HCV and HIV antibodies was 1.00 while that for HBsAg was 2.00. A value in the range of 0.6 – 1.4 was considered as borderline in case of HCV and HIV while that of 1.5 – 2.5 was considered borderline for HBsAg. All borderline cases were repeated after re-centrifugation of the same or on a fresh sample. Samples giving borderline results were repeated after an interval of 2-3 weeks.

Questions that were incorporated in the questionnaire included socio-economic status, profession, living conditions in the house, education and employment status, previous history of blood transfusion, surgery, hospital admission, visit abroad during the last one year, previous history of injections, dental procedures or tooth extraction, history of tattooing and family history of HBV, HCV and HIV infection. Blood samples were taken after proper informed consent. Confidentiality and anonymity of subjects was assured. All the expenses of laboratory investigations were arranged by the key investigator of the study. HIV test results were communicated confidentially to the referring consultants and not disclosed to the patients directly. Positive HIV test results were re-confirmed by PCR. The data obtained were evaluated and analyzed by applying descriptive statistics. All the variables were put in SPSS version 16 such as age, sex, different professions, tests results of HBV, HCV and HIV, history of blood transfusion, surgery, tooth extraction etc. Percentages and frequencies of HBV, HCV and HIV in age groups, in different professions and gender distribution were computed. The entire study duration was 4 months.

**Table 1: Gender wise frequency distribution of HBs Ag, HCV and HIV in IDPs (n=300)**

Gender	Hepatitis B			Hepatitis C			HIV		
	Negative	Positive	Total	Negative	Positive	Total	Negative	Positive	Total
Male	159 (53.0%)	31 (10.33%)	190 (63.3%)	170 (56.7%)	20 (6.7%)	190 (63.3%)	188 (62.7%)	2 (0.7%)	190 (63.3%)
Female	100 (33.3%)	10 (3.33%)	110 (36.6%)	95 (31.7%)	15 (5.0%)	110 (36.7%)	109 (36.3%)	1 (0.3%)	110 (36.7%)
Total	259 (86.3%)	41 (13.7%)	300 (100%)	265 (88.3%)	35 (11.7%)	300 (100%)	297 (99.0%)	3 (1.0%)	300 (100%)

**Table 2: Age wise distribution of hepatitis B, Hepatitis C and HIV in IDPs of South Waziristan (n=300)**

Age	Hepatitis B			Hepatitis C			HIV		
	Negative	Positive	Total	Negative	Positive	Total	Negative	Positive	Total
18-30 Years	93 (31.0%)	16 (5.3%)	109 (36.3%)	107 (35.7%)	2 (0.7%)	109 (36.3%)	107 (35.7%)	1 (0.3%)	109 (36.3%)
31-40 years	75 (25%)	12 (4%)	87 (29%)	80 (26.7%)	7 (2.3%)	87 (29.0%)	86 (28.7%)	2 (0.7%)	87 (29.0%)
41-50 years	45 (15%)	8 (2.7%)	53 (17.7%)	44 (14.7%)	9 (3.0%)	53 (17.7%)	53 (17.7%)	0 (0.0%)	53 (17.7%)
>50 years	46 (15.3%)	5 (1.7%)	51 (17.0%)	34 (11.3%)	17 (5.7%)	51 (17.0%)	51 (17.0%)	0 (0.0%)	51 (17.0%)
Total	259 (86.3%)	41 (13.7%)	300 (100%)	265 (88.3%)	35 (11.7%)	300 (100.0%)	297 (99.0%)	3 (1.0%)	300 (100%)

**Table 3: Risk factors associated with HBV, HCV or HIV infection (n=300)**

Risk Factor	Hepatitis B		Hepatitis C		HIV	
	Total	Positive	Total	Positive	Total	Positive
H/O Surgery	62	05 (1.7%)	62	20 (6.7%)		
H/O Tooth Extraction	114	17 (5.7%)	114	08 (2.6%)	114	1(0.3%)
H/O Accident	14	00 (0.0%)	14	05 (2.0%)		
H/O Visit Abroad	49	15 (5.0%)	43	10 (3.3%)	49	1 (0.3%)
H/O Blood Transfusion	25	05 (1.7%)	25	18 (6.0%)		
H/O Hospitalization	49	02 (0.7%)	49	13 (4.3%)		
H/O Drug Abuse	09	01 (0.3%)	9	04 (1.3%)	09	1(0.3%)

## RESULTS

A total of 300 IDPs were screened for HBsAg, anti HCV and anti HIV antibodies out of which male were 190 and female were 110 (Table 1).

Out of 300 IDPs tested, more male were suffering from hepatitis B (10.3%), than hepatitis C (6.7%) or HIV (0.7%) as compared to female (3.3%), (5%) and (0.3%) respectively (Table 1). Age distribution of IDPs is shown in table 2.

Table 3 portrays different risk factors which may be associated with HBV, HCV or HIV infection in IDPs. His-

tory of tooth extraction was present in 17(5.7%) cases of hepatitis B, 08 (2.6%) cases of hepatitis C and 1(0.3%) cases of HIV. Twenty cases (6.7%) of hepatitis C had history of previous surgery. HIV, infection was found positive in 1 (0.3%) driver, one patient (0.3%) belonged to others professions and 1 house wife was found positive. In age group 18-30 years only 1 (0.3%) case found positive and in age group of 31-40 years 2(0.7%) cases were positive (Table 2).

## DISCUSSION

Recently, in Pakistan, involuntary internal displacement occurred on a large-scale as a result of multiple

factors. One of the main causes for this internal displacement in 2009 was the military operation against militants in Malakand region of the KP province and FATA. In the present study we investigated the displaced persons of South Waziristan, for the frequency distribution of hepatitis B, hepatitis C and HIV infections. Studies have confirmed that infectious diseases are most common in low socio-economic rural areas<sup>27</sup>. As per our knowledge till date no study on the frequency of HBV, HCV and HIV is available on internally displaced persons of D.I. Khan.

In our study, 13.7% IDPs were found positive for HBV, in which male were 29 (10.35%) and female were 12 (3.35%). Our results are comparable with the findings of Rauf et al<sup>28</sup> on IDPs of Swat, which shows a prevalence of 9% of HBV. These IDPs are mostly from low socio-economic strata, unaware from health education, with low literacy rate and having no/low knowledge of transmission of hepatitis and other infectious diseases.

Our study reported that males were infected more compared to female (63.3% and 36.6% respectively). Similar results have been reported earlier from other parts of Pakistan which shows high prevalence of these infections in male population (78.04%) as compared to female (21.95%) by Khan et al<sup>29</sup> and Shazi et al<sup>30</sup>. This has also been observed in neighboring countries like Iran by Zali et al<sup>31</sup> and northern China by Zang et al<sup>32</sup>. This high rate of HBV prevalence in Pakistan may be associated with the fact that male in rural areas are socially more active than female, hence chances of acquiring infection is more with many other risk factors such as sexual exposure.

The frequency was high in younger age groups which are comparable with the study of Nafees et al<sup>33</sup> which show high frequency of HBV in age group of 20-29 years as 2.28%. According to Khattak et al<sup>34</sup> the prevalence of HBV is high in young age children compared to older population. Prevalence of HBV was higher than HCV in this study compared with Khattak et al<sup>35</sup>. Different studies on professional blood donors and drug abusers show prevalence rate of up to 40%<sup>36</sup>.

In our study frequency of HCV was 11.7% in IDPs where male were 6.7% and female were 5.4%. Many studies showed that prevalence rate is higher in rural area than urban. If we compare results of our study with Nafees et al<sup>33</sup> prevalence was 21.7% (male 10.8% and female 11.9%) which show high prevalence. Prevalence rate reported by Khattak et al<sup>35</sup> showed a rate of 6.5%. The highest prevalence was recorded in age group above 50 years (5%) which is comparable to the findings of Baha et al<sup>37</sup>. The reason of this increasing prevalence with age is that longer exposure to risk factors such as use of unsterilized equipments, reuse of syringes in most areas of Pakistan may contribute more

and more. Memon et al<sup>38</sup> also showed high prevalence in older age group than younger. Rahman et al<sup>39</sup> reported that data for transfusion transmissible diseases was scanty due to lack or insufficient reporting system. In our study frequency of HCV was high in those who have previous history of blood transfusion. This is one of the important risk factors for HCV transmission.

In our study, total frequency of HIV was 1.0%, in which male were 0.7% and female 0.3%. In different studies different seroprevalence rates of HIV have been recorded (0.1% by National AIDS Control Program in 2001 versus 0.73% by Khanani et al<sup>41</sup>. In this study frequency in different age groups 18-30 years and 31-40 years was 0.7% and 0.3% respectively. One of the HIV patient had a history of visit abroad and the other one was a driver. Mostly tribal men visit to the oil rich Gulf states because of low socio-economic status.

Ali and Bukhari<sup>42</sup> reported that these workers live abroad (away from their wives) for long periods so they engage there in unprotected sex with more than one partners, usually commercial sex workers and homosexuals, leading to increased rate of infection transmission. Hyder et al<sup>43</sup> in their study in Sind reported that drivers mostly use young boys for sex and do not use condoms. Both the truck drivers and external migrants increase the risk of transmission to their spouse due to lack of education / knowledge about risk factors of HIV.

In our study the frequency of HBV, HCV and HIV were 43(14.3%), 36(12%) and 3(1.0%) by ICT; while it was 43(13.7%) and 35(11.7%) for HCV and HBV by ELISA. If we compare our results with Khan et al<sup>29</sup> where they detected anti HCV antibody on ICT as 3.9% while 1.89% on ELISA which show a significant difference between ICT and ELISA. While in another study samples tested by ELISA when tested by ICT the results' sensitivity of HBsAg were 98% and 95% by different ICT kits however, HCV detection on ICT was 85% and 83% which does not show that much difference<sup>35</sup>. In one another study by Rahman et al<sup>39</sup> in blood bank of Lahore found 0.15% false positive reports of HIV, HBV and HCV on ICT when retesting again on ELISA. These false positive results could be due to cross reactivity with, multiparty, anti HLA antibodies, multiple blood transfusions, recent vaccination, autoimmune diseases, alcohol use, malaria and dengue viral infections.

## CONCLUSION

The frequency of HBV was higher as compared to HCV and HIV infections, respectively. HBV infection was more in age group 18-30 years while HCV infection was more in patients having age of 51 years or above. HIV infection was comparatively more in patients having age group 31-40 years. The frequency of all the three infections was comparatively more in males as com-

pared to females. Most likely risk factors for acquisition of infection were suspected to be unhygienic tooth extractions, unsafe blood transfusions and iatrogenic.

## RECOMMENDATIONS

Keeping in view high frequency of HCV, HBV and HIV in IDPs a great effort is required to identify the infected people of HBV, HCV and HIV. With regard to the spread of transmission of HBV, HCV and HIV through blood transfusion, unsterilized instrument use in surgical and dental procedure, reuses of syringes, tattooing, ear and nose piercing, shaving from barber and preventive measure in sex education are important factors for prevention and control of these deadly viral infections. It is important to prevent these diseases by creating awareness and health education in these IDPs and general public. The task will be accomplished effectively when electronic media, government, NGOs, local body and religion scholars are collectively and effectively involved.

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#### CONTRIBUTORS

RN conceived the idea, planned the study, and drafted the manuscript. SM, JA, HM, and NA helped acquisition of data and did statistical analysis. MSHQ critically revised the manuscript. All authors contributed significantly to the submitted manuscript.