Seroprevalence of Hepatitis B Virus
(Case in District Mardan, Pakistan)

Maryam Nawab¹, Rahat Ullah², Basit Ali³, Nouman⁴ & Muhammad Ayaz⁵

¹Maryam Nawab, ²Rahat Ullah, ³Basit Ali, ⁴Nouman, & ⁵Muhammad Ayaz
Bs Zoology, Govt Post Graduate Collage Mardan
Mardan, Pakistan

Abstract: The magnitude of chronic infection with hepatitis B virus (HBV) varies substantially between the countries. Although Hepatitis B has been well studied, there are many regions with a high seroprevalence. The purpose of this investigation was to find out the seroprevalence of HBV infection in District Mardan, Khyber Pakhtunkhwa, Pakistan. Total of 404 samples with the positivity rate of 16.08% were collected by ICT & ELISA test method from Mardan Medical Complex Hospital. Among them 11.38% were male patients and 4.70% were female with the p value of 0.0045. Hepatitis B and C virus infection is a serious health problem and a high rates of seroprevalence of viral Hepatitis have been observed in various region in District Mardan.

Keywords: Seroprevalence, KPK, ICT, ELISA, & Mardan Medical Complex.

1. INTRODUCTION
Hepatitis B virus (HBV) infection is the main cause of chronic hepatitis, liver cirrhosis, and hepatocellular carcinoma (Ni, Y.H et al., 2001). Hepatitis B is one of the maximum commonplace and critical infectious diseases globally (Leung et al., 2001). Current World Health Organization estimate, two billion humans internationally have serologic proof of past or gift HBV infection, and 360 million are chronically infected and at danger for HBV-associated liver ailment (Shepard et al., 2006). Greater than 520,000 peoples die every year from HBV related acute and chronic liver sickness (Masood, Z et al., 2005). Humans chronically infected with HBV live in all elements of the globe while is most common in Asia (Lok and McMahon, 2002). About 75% of those stay within the Asian and Western Pacific areas having HBV (Leung et al., 2001). The seropositivity ratio of Hepatitis B surface antigen (HBsAg) varies within the exclusive regions of the sector with a tremendous low ratio in the evolved nations like 0.6% in Wales and England, 1.2 % in America (Alam et al., 2007). The seropositivity is occur up to 2.2 million in United States that is principally higher 3.45% (Gish et al., 2015). The infection rate is annually 4000 to 5500 deaths occur within the United States because of liver failure and hepatitis (Dienstag and J.L, 2008). The increasing rate of their seropositivity is occur different in different devolving international locations such as 3% to 11% in Egypt, 4% to 5% in Iraq, 2% to 5% in UAE, 2.27% to 18.5% in Yemen, 7% to 17% in Saudi Arabia, an 16% to 20% in Sudan (Qirbi and Hall, 2001). It is estimated a high alarming ratio reporting 19.6% in Egypt, 3.5% in Palestine, 1.6% to 7.7% in Brazil and 2% to 10% in India (Alam et al., 2007). The seropositivity occur about 56% to 98% in peoples.
sub-Saharan Africa and 69% in the population of Pacific island of Nauru (Gish et al., 2015). Seropositivity is estimated at about 13.6% in Nigeria, 25.7% in surgeons, 1.16% in Ghana, 3.3% in Zimbabwe, 4.6% in South Africa, 9.5% in Senegal, 16.1% in Zambia, and 24% in southern Tanzania (Zampino et al., 2015). In Pakistan the seropositivity ratio have discovered that 30% to 42% is the instances of persistent liver sickness and 78% of the instances of hepatocellular carcinoma were HBsAg positive (Akhtar et al., 2005). According to WHO, Pakistan falls beneath the endemic vicinity with HBV inflamed population, publicity charge of HBV in Pakistan is not always known sincerely (Khan, F et al., 2011). On a massive wide variety seropositivity studies had been achieved in Pakistan over the earlier two decades (Qureshi et al., 2010). While there are about 9 million humans are infected with HBV while their number is increasing gradually (Ali et al., 2011). In Lahore nearly 5% trendy populace are HBV service (Masood, Z et al., 2005). The rate of seropositivity in Rawalpindi and Karachi is estimated between 70 to 80% (Parker et al., 1999). In a network-based observe in Hafizabad, Punjab, HBV infection became common up to 4.3%. Previous research in Pakistan have pronounced that 10% of paid donors and 05% of replacement donors had HBV infection (Mujeeb & Pearce, 2008).

Aims and Objectives
A very little data is available on the incidence of hepatitis B in the individual of visiting Mardan Medical Complex Hospital in district Mardan despite of the fact they cause major constrain to human body. The aim of the present investigation was to evaluate the frequency, incidence, risk factors and transmission, as well as the seropositivity of Hepatitis B in the patients of district Mardan.

2. MATERIAL AND METHOD
On the basis of survey finished in laboratories in Mardan Medical Complex Hospital KPK Pakistan from September 2017 to January 2018. The total 400 samples of hepatitis B were collected from patients along with their information of area, sex, education and marital status through interview.

Immuno Chromatographic Technique (ICT)
First of all 2 ml of blood collected from every suspected person in a gel tube or EDTA tube, put this tube in centrifuge machine for 2 minutes. A test device from Hepatitis B foil pouch and put 50 µl of plasma or serum on the well of the device with the help of micropipette. Put 2 drops of HBV buffer on HBV strip and incubate for 20 minutes at room temperature thus it give result. There are 2 colored bands (C control line & T test line) present it means that HBV result is positive, if there are only 1 colored band (C control line) then it means that the test result is negative but if there is no colored band then the result will be considered invalid and is retested the plasma with proper constructions.

Enzyme Linked Immuno Sorbent Assay (ELISA)
All the reagents were brought at room temperature, all the components were shaken well and the plate was removed from the package. Firstly added 50µl of HRP conjugate reagent of HBS in 3 Microwell of ELISA kit with the help of micropipette, then add 50 µl of serum on it, plates was covered with sealing sheet and were leave for one hour at room temperature. After one hour remove the sheet and reagents from microwells and washed clearly 5 times with wash buffer and 50µl of Chromogen solution A and 50µl Chromogen solution B was added in the wells, then cover and incubate it for 15 minutes at 37°C for further reaction protected from light and their color become yellow. Thus their color changed into yellow and immediately added 50 µl of stop solution, if their color is changed into blue thus it means patient have Hepatitis B but if the color does not changed then the result is negative. The specific value of the result is occur by ELISA Plate Reader.
3. RESULTS

**Table: Seroprevalence of Hepatitis B in District Mardan**

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>f (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis B</td>
<td>65(16.08%)</td>
<td>404</td>
<td></td>
</tr>
<tr>
<td>Area</td>
<td></td>
<td></td>
<td>0.1587</td>
</tr>
<tr>
<td>Rural</td>
<td>34(8.41%)</td>
<td>243</td>
<td></td>
</tr>
<tr>
<td>Urban</td>
<td>31(7.61%)</td>
<td>161</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td>0.0045</td>
</tr>
<tr>
<td>Male</td>
<td>46(11.38%)</td>
<td>221</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>19(4.70%)</td>
<td>183</td>
<td></td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
<td>0.0066</td>
</tr>
<tr>
<td>Educated</td>
<td>27(6.68%)</td>
<td>112</td>
<td></td>
</tr>
<tr>
<td>Uneducated</td>
<td>38(9.40%)</td>
<td>292</td>
<td></td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td>0.0000</td>
</tr>
<tr>
<td>Married</td>
<td>29(7.17%)</td>
<td>291</td>
<td></td>
</tr>
<tr>
<td>Unmarried</td>
<td>36(8.91%)</td>
<td>113</td>
<td></td>
</tr>
</tbody>
</table>

**Fig 01: Over all Seroprevalence of Hepatitis B**

In district Mardan over all of HBV samples were collected from MMC hospital are 404 in which 65 patients were found HBV positive with the percentage of 16.08%.

**Fig 02: Area wise Seroprevalence of Hepatitis B**

Total number of HBV patients screened from rural area was 243 in which positive range is 34 with the percentage of 8.41% while from urban area 161 patients in which positive range is 31 with the percentage of 7.61%.
221 Male are tested with HBV in which positive are 46 (11.38%) while total 183 females samples are collected in which 19 are positive (10.47%).

On the basis of education level total HBV samples are divided into literate of 112 peoples in which 27 are positive with the percentage of 6.68% while illiterate of 292 samples in which 38 are positive with the percentage of 9.40%.

According to marital status total 291 samples are of married peoples in which 29 are positive with 7.71% percentage while 113 samples are of unmarried peoples in which 36 are positive with 8.91% percentage.

4. DISCUSSION

In current study the over-all seroprevalence of HBV infection is 16.08% that is nearly lower than Rehman et al., (2014) came about that HBV positivity is 34.81% in DHQ Mardan. The principle reason in their diminishing rate is a direct result of individuals is due to more of the peoples are uneducated and unawareness of Hepatitis disease. The ongoing investigation is higher than Daudpota and Soomro, (2008) that is 9.33% in City Medical Center Jacobabad. The principle reason might be a direct result of unhygienic or polluted food substance and more of the peoples belong to low monetary status.
Present HBV information accumulation having occurrence of 8.41% in rural and 7.61% in urban region (P-value 0.1587) that is marginally higher than Mehmet et al., (2005) who inspect that infection in Turkey where the frequency was 8.2% in country and 6.2% in urban region. This is a result of the most people groups in Mardan have low monetary status which is more dangerous to disease. The present non-significant investigation is somewhat higher than Liang et al., (2009) who details that HBV positivity is 7.3% in provincial region while 6.8% in urban region in China that might be because of the knowledge transmission of the infection and peoples are at the higher risk of infection by slightly in contact with infected blood.

The seropositivity of HBV in present male is 11.38% and 4.70% in female (P-value 0.0045) which is more inferior rate then Khan, J et al., (2017) who's outcomes demonstrates that inspiration of 52.86% in male and 51.72% in female and Munir et al., (2013) report HBV predominance of 69% male and 31% females in Mardan. In the majority of the correlation male have higher perversiveness then female on account of the way that guys have association in blood donation and they are employed outside of their home like visiting hair salon, unhygienic and junk food of restaurants. The current significant examination is higher than Liang et al., (2009) who depict the HBV prevalence in male that is 8.6% and in female is 5.7% in China. The reason may be family history of hepatitis, blood transfusion and most of peoples belong to low financial status in Mardan.

Current examination HBV demonstrate that in literate people groups are 6.68% while in illiterate are 9.40% (P-value 0.0066) that is slightly similar to Mujeeb and Pearce, (2008) who estimate HBV seropositivity were 5.7% in educated people groups in Sindh. Their similarity might be because of both the zone having same climatic condition and health care system. The current significant examination is to somewhat related to Liang et al., (2009) who articulate HBV inspiration in uneducated people groups at the range of 9.7% and in proficient people groups of various gatherings like primary schools have 8.8%, middle school have 9.1%, High school have 8.3%, junior college have 5.9% and under graduate have 3.1% in China. The reason might be because of inappropriately cleaned instruments utilized by dental practitioners. While the present investigation demonstrate high occurrence of HBV happen than Nguyen et al., (2007) who directed that uneducated people groups having 70.69% and educated having 70.0% of secondary school and 62.4% of higher school. Their primary cause might be contaminated water, the majority of the unhygienic sustenance.

Current study HBV in married were 31.5% and in unmarried were 6.75% (P-value 0.0000) of seropositivity that is lower than Akhtar et al., (2005) who present their positivity in married are 45.3% and in unmarried are 54.7% in Karachi. The reason is due to partner’s transmission and sharing of personal items like toothpaste. Somewhat current significant study is lower than Qureshi et al., (2010) who present HBV seroprevalence in married peoples are 3.4% and are 1.8% in unmarried in Pakistan and Nguyen et al., (2007) who resulted that single peoples have 52.0% while married peoples have 72.4% prevalence in Vietnam. This may be due to environmental condition, tattooing and re-use of syringes.

5. CONCLUSION

The outcome of the current study specify that there is significant seroprevalence detection of 16.08% of Hepatitis B virus in patients visiting Mardan Medical Complex Hospital that is considered as high seroprevalence, during the study it is discovered that there is lack of knowledge and poor attention of peoples toward these diseases.

Based on the finding of present research it is concluded that Hepatitis B are at the high risk of infection by following factors like contaminated surgical instruments, re-use of syringe for therapeutic injections, shaving from a barber and directly contact with blood or blood product.

6. ACKNOWLEDGEMENT

I have no words to express my deepest sense of gratitude to Allah Almighty, the Lord of the Alamin (mankind, jinns and all the exist) Who enabled me to complete this task successfully, I would like to pay special thankfulness, warmth and appreciation to the persons below who made my research successful and guide me at every step of my study.

My supervisor Rahat Ullah for the continue support of my research, for his patience, enthusiasm and immense knowledge. His encouragement made it possible to achieve the goal. I am grateful to Sir Basit, whose reminders constructive criticism and timely guidance which encouraged me at every step in completion of my research thesis. I would like to express my wholehearted thanks to my parents, without whom I was nothing, they just not only support me financially but also extend their support morally and emotionally.
7. REFERENCES


