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# Comparative Evaluation of ALT & AST Levels of Hepatitis B and C Infected Pregnant Women in Lahore, Pakistan

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**Abstract:**
During pregnancy viral Hepatitis may cause maternal complication whichmay lead to still birth.Pakistan isthe second country in the world having high prevalence of chronic hepatitisB and C infections alongside the highest fertility ratetherefore chances of vertical transmission and pregnancy complications are high primarily due to compromised liver functions. The aim of this study wasto screen the hepatitis B and C virus infected pregnant women in Lahore and to monitor their liver function enzymes(ALT & AST).From January 2018 to December 2018,15000 pregnant females in different areas of Lahore were screened by ICT method for Hepatitis B surface antigen (HBsAg) and Hepatitis C antibodies (Anti HCV). Positive samples are confirmed by ELISA. ALT and AST of hepatitis B, hepatitis C infected and healthy pregnant women were estimated.**:**149 pregnant females out of 15000 were positive for HCV and 45 cases were diagnosed positive for HBV. ALT and AST of these viral infected females were compared with healthy pregnant females. In HCV analysis, the values of ALT and AST were significant. Paradoxically, the HBV analysis revealed insignificant differences of these estimated enzymes. Hence, statistically co-infection of Hepatitis B&C indicates significant ALT while insignificant AST.The present study confirms the low endemically prevalent Hepatitis B&C infections among

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pregnant women in Lahore, Pakistan. HCV elevate ALT and AST levels among pregnant women while during HBV infection they remain within normal range.

**Key words:** Hepatitis, Pregnancy, ALT, AST.

**Introduction:**

Presence of inflammatory cells in liver is called Hepatitis which may lead to the liver Cirrhosis or Hepatocellular Carcinoma. Mostly etiology of Hepatitis is viruses particularly Hepatitis B and C virus[1]. These viruses are blood-borne pathogens and can be transmitted either horizontally or vertically. Prior transmission eventuates via contaminated needle sticking, tattooing, blood and blood products transfusion, razors and unsterilized dental or other surgical equipment.Other body fluids including seaman, saliva, menstrual and virginal secretions canalso transmit these viruses. Hepatitis B virus can survive up to 7 days in environment which also increases its virulence. Both of the viruses have long incubation periods and have no particular sign and symptoms until become chronic which makes them difficult to diagnose in early stages of infection[2,3]. Hepatitis viruses only enter into hepatocytes due to presence of special molecules on the surface on hepatocytes which act as virus receptors[4].These viruses can elevate serum Alanine Aminotransferase (ALT) and Aspartate Aminotransferase (AST) enzymes which are associated with liver damage. These Aminotransferases especially serum AST level also excrete from skeletal muscle and cardiac muscle therefore these enzymes are not always associated with liver damage [5].

In 2015, enigmatically around 257 million people are infected by Hepatitis B and 71 million people are diagnosed as Hepatitis C positive which causes 1.34 million deaths annually across the world. Unlike other endemic diseases like malaria, tuberculosis and HIV, the mortality rateof viral Hepatitis is inflating which has been increased by 22% since2000[6].Pakistan hassecond highest population of chronic hepatitis B and C in the world [7] which is alarming condition where 150 000 new cases are diagnosed positive every year. The number of Hepatitis B and C patients has reached to 12 million in the country [8].In Pakistan HCV prevalent equally in both genders but HBV has more men victims than women[9]. Women having viral hepatitis can develop severe maternal complications even fetal deaths during pregnancy. Hepatitis B virus has high vertical transmission rate than HCV [10]. Hepatitis B can transmit vertically if mother is chronic carrier or develop infection during last stage of pregnancy[11].While transmission of HCV depends on the viral load in pregnant mother[12].Treatment of hepatitis B is different during pregnancy because Hepatitis B immunoglobulin and vaccinations are not enough to reduce the risk of vertical transmission that's why other anti-viral drugs may also be prescribed. The treatment of Hepatitis C involves variation in pregnant women than that of normal patients [13,14].

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| Symptoms | Hepatitis | | |
|---|---|---|---|
| | A | B | C |
| Dark urine | ✓ | ✓ | ✓ |
| Stomach/abdominal pains | | ✓ | ✓ |
| Jaundice (yellowing of the skin/eyes) | ✓ | ✓ | ✓ |
| Pale or clay-colored stool | ✓ | | ✓ |
| Fever | ✓ | ✓ | ✓ |
| Loss of appetite | ✓ | ✓ | ✓ |
| Fatigue | ✓ | ✓ | ✓ |
| Nausea/vomiting | ✓ | ✓ | ✓ |
| Aching joints | | ✓ | |

**Symptoms of Hepatitis A, B and C**

**Material and Methods:**

Samples are collected from different areas of Lahore in the period of one year, from January 2018 to December 2018. A fixed questioner is used to select the females who have same sociodemographic (age, locality, occupation). 3ml samples are collected in gel vacutainers and transport to college laboratory maintaining the temperature of the samples from 4°C to 6°C. Serum is separated after centrifugation and Hepatitis C antibodies (anti HCV) and Hepatitis B surface antigen (HBsAg)are screened by immunochromatography (ICT) method and Accurate cassettes (USA) are used.As a result positive samples are confirmed by ELISA method. Liver enzymes (ALT, AST) are estimated automatically onBACKMAN COULTER AU680.


**MAP OF Lahore City Pakistan**

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**Statistics:** Data is repeatedly checked and thenanalyzed by T test using statistical package for social science(SPSS) version 16.0. The co-infection is analyzed by using one way ANOVA. The **P** value <0.05 is considered as significant.

**Ethics:** The study is approved by the ethics committee of Imperial College of Business Studies Lahore while the consent is taken from the targeted population.

**Results:**

Out of 15000, we met with 149 positive HCV cases (0.99%) and 45 HBV positive cases (0.3%) among the pregnant studied population. These retrospective HCV & HBV Patients we also gauged their ALT and AST Levels, respectively. We also included control referral group (n=150) while cross checked with HCV and HBV infected individual. ALT and AST of both control group and infected groups (HBV & HCV) are noted and been compared. In first comparison where ALT are noted as 49.00±32.89 and 34.87±9.25 in both HCV and control group (<0.001) respectively whereas AST is 56.32±41.59 in HCV group and 42.68±24.81 in control group (0.001). Both AST and ALT are noted as incomparable or significant parameters between the HCV and control groups (Table 1).

**Table 1: HCV infection in pregnant women and their association with AST, ALT**

| Variables | HCV POSITIVE | CONTROL | P Value |
|---|---|---|---|
| ALT | 49.62±32.82 | 34.87±9.25 | <0.001 |
| AST | 56.32±41.59 | 42.68±24.81 | 0.001 |

ALT and AST are taken by mean ± SD, Independent t-test was used for noticing the significant p-value (<0.05) of both AST and ALT between HCV positive and control individuals among the pregnant women studied population.

**(HCV) Hepatitis C virus , (ALT) Alanine aminotransferase, (AST) Aspartate aminotransferase**

Moreover, HBV infection in the reflection of control group, ALT is noticed as 39.84±18.04 VS 34.87±9.25 P=0.42 whereas, AST is 44.37±18.92. VS 42.68±24.81 P = 0.92, respectively. Therefore in HBV infection and control group comparison ALT and AST are found insignificant (>0.05) (Table 2).

**Table 2: HBV infection in pregnant population and their association with AST, ALT**

| Variables | HBV POSITIVE | CONTROL | P Value |
|---|---|---|---|
| ALT | 39.84±18.04 | 34.87±9.25 | 0.42 |
| AST | 44.37±18.92 | 42.68±24.81 | 0.95 |

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ALT and AST are taken by mean ± SD, Independent t-test was used for noticing the significant p-value (<0.05) of both AST and ALT between HBV positive and control individuals among the pregnant women studied population.

**(HBV) Hepatitis B virus , (ALT) Alanine aminotransferase, (AST) Aspartate aminotransferase**

In addition, apart from control group both the infected groups i.e. HBV and HCV were analyzed together by using one way-ANOVA in order to know the significant contribution of both ALT and AST comparatively. Interestingly, we found ALT (49.62±32.82 VS 39.84±18.04) in both HCV and HBV group significant (0.03) whereas AST were noticed insignificant in both the HCV and HBV groups (56.32±41.59 VS 44.37±18.92; P = 0.08, respectively) (Table 3).

**Table 3: Healthy controlled**

| Variables | HCV | HBV | P Value |
|---|---|---|---|
| ALT | 49.62±32.82 | 39.84±18.04 | 0.03 |
| AST | 56.32±41.59 | 44.37±18.92 | 0.08 |

ALT and AST are taken by mean ± SD, one way ANOVA was used for noticing the significant p-value (<0.05) of both AST and ALT between HCV positive and HBV Positive individuals among the pregnant women studied population.

**(HCV) Hepatitis C virus, (HBV) Hepatitis B Virus, (ALT) Alanine aminotransferase, (AST) Aspartate aminotransferase.**

## DISCUSSION:

Screening of viral hepatitis is important to decrease the risk of hepatitis prevalence and to avoid the complications of viral hepatitis in pregnant women. During pregnancy, screening of HCV and HBV is important to reduce the risk of vertical transmission. Our study reveals that HCV infect 0.99 % pregnant females of Lahore and HBV 0.3% pregnant females, which is lower than previous studies.In 2001 the prevalence of hepatitis C in pregnant women in Lahore was studied in which 6.0% females were diagnosed positive [15] and in 2008 the prevalence of hepatitis B and C were 2.2% and 7.3% respectively [16]. Decrease in infected pregnant females' number in our study is due to decrease in the transmission of virus by syringe or through blood transfusion in Lahore. In 2009 hepatitis B infect 1.61% female population in Lahore that is now decrease to 0.3% in pregnant females because of vaccination of hepatitis B [17]. Another reason of decrease number in pregnant females with viral hepatitis is the awareness to avoid pregnancy during infection.Irshad Ahmad (2016) studied the prevalence of HCV and HBV among pregnant females in Peshawar, Pakistan where 1.16% females were HCV infected and 1.22% females were HBV infected [18]. Another recent study show the prevalence of HCV and HBV in pregnant women of KPK is 1.67% and 2.22% respectively [19].Where in Karachi, the prevalence

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of hepatitis B is 0.34%, which is approximately equal to our study (0.3%) [20]. Prevalence of viral hepatitis is low in Lahore and Karachi because the health care facilities are batter there than Khyber PakhtoonKhawa (KPK) and other regions of Pakistan.

In India the prevalence of hepatitis B during pregnancy was 1.2% which is three times higher than our study [21] while in 2006 HCV prevalence was 1.03% which is also higher than our results [22]. Comparing with the other regions of the world the prevalence of HBV is much higher 18.2% and 7.2% respectively in the pregnant women of Zaria [23] and Kano [24], Nigeria. These differences in result may be due to difference in groups which has difference in risk factor for infection, availability of vaccination and endemicity of infection in region. Result of HCV in pregnant women of Lahore is low as compare to the normal persons of South East Asia (2.15%), Europe (1.03%) and America (1.17%) [25].

In early stages, viral hepatitis is usually asymptomatic but it can beassessed by alteration in ALT and AST blood levels. Increase in these Aminotransferases enzyme levels is high in HCV as compare to HBV [26]. During pregnancy levels of ALT and AST remain within normal range [27]. But patients with HCV has increased ALT levels during pregnancy [28]. In our study ALT levels are also raised in HCV infection but remain within normal range in HBV infection. AST also represent the same variation in both infections that it`s value increase in HCV but not in HBV. A study on HBV infected pregnant females' exhibit normal ALT levels [29]. Another study on pregnant females having HCV also shows elevated ALT level [30] which resemble to our results both in hepatitis B and C cases. In another study pregnant females having HBV are diagnosed with normal ALT levels which support the results of our study[31]. In this study statically when we combine the both HCV and HBV infections in pregnant women using one way ANOVA than ALT elevate but AST remains within normal range.

**Conclusion:**

This study conclude that HCV and HBV are low endemically prevalent in the pregnant women of Lahore with the percentage of 0.9% and 0.3% respectively which is comparativelylow than the other areas of Pakistan and less prevalent ratio than previous studies which indicates the improvement in transmission precautionary methods. HCV causes the elevation in ALT and AST during pregnancy but in HBV pregnant females the values remain within normal limits. Statically women having both HCV and HBV infections can exhibit increase ALT and normal AST values which can be estimated in future studies.

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