



## Unique Journal of Medical and Dental Sciences

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Research Article

# SEROFREQUENCY OF HEPATITIS B AND C AMONG SUDANESE PREGNANT WOMEN ATTENDING MILITARY HOSPITAL

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Received: 20-01-2015; Revised: 16-02-2015; Accepted: 12-03-2015

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## ABSTRACT

Hepatitis B and C are a major disease of serious global public health problem. This study was conducted among 100 pregnant women attending military hospital, Khartoum, Sudan to determine the sero frequency of Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV). The blood samples were tested for hepatitis B surface antigen (HBsAg) and Anti-HCV using ELISA technique. The results showed that three Percent (3%) and one percent (1%) of the 100 blood samples tested positive for HBV and HCV respectively. 7% ,3% tested positive for HBV and HCV respectively shown in group between 20-25 years old rather than other group and even on those was its first time for pregnancy.

**Keywords:** Hepatitis, Pregnancy, Women, Sero frequency, Sudan.

## INTRODUCTION

Hepatitis is an inflammation of the liver characterized by the presence of inflammatory cells in the tissue of the organ. It may occur with limited or no symptoms, but often leads to jaundice, anorexia (poor appetite) and malaise. Hepatitis is acute when it lasts less than six months and chronic when it persists longer<sup>1</sup>. The hepatitis virus is found in the blood and other body fluids and is transmitted from person to person, the most common routes of infection includes blood transfusions and blood products where there is no screening for blood-borne viruses, medical or dental interventions in countries where equipment is not adequately sterilized mother to infant during childbirth, sexual transmission (in the case of hepatitis B), sharing equipment for injecting drugs, sharing straws, notes etc. for snorting cocaine (cocaine is particularly alkaline and corrosive), sharing razors, toothbrushes or other household articles, tattooing and body piercing if done using unsterile equipment<sup>2</sup>.

The hepatitis B virus, a hepadnavirus, is a 42 nm partially double stranded DNA virus, composed of a 27 nm nucleocapsid core (HBcAg), surrounded by an outer lipoprotein coat (also called envelope) containing the surface antigen (HBsAg), spread between people through contact with the blood or other body fluids (i.e. semen, vaginal fluid and saliva) of an infected person, while the hepatitis C virus has a positive sense single-stranded RNA genome. The

genome consists of a single open reading frame that is 9600 nucleotide bases long. This single open reading frame is translated to produce a single protein product, which is then further processed to produce smaller active proteins. Spread through direct contact with infected blood. Very rarely it can also be passed on through other body fluids. Many people infected with hepatitis B or C rarely displays any symptom, although they can still transmit the virus to others<sup>3</sup>.

Hepatitis B is a major disease of serious global public health proportion. It is preventable with safe and effective vaccines that have been available since 1982. Of the 2 billion people who have been infected with the hepatitis B virus (HBV) globally, more than 350 million have chronic (lifelong) infections<sup>4</sup>. Over 20 million people are infected annually with this virus<sup>5</sup>. Hepatitis C is a viral infection of the liver and is the most common blood-borne (direct contact with human blood) infection. The major causes of HCV infection worldwide are use of unscreened blood transfusions, and re-use of needles and syringes that have not been adequately sterilized. The world health organization (WHO) estimates that about 3% of the world populations (200 million people) have so far been infected with the Hepatitis C virus<sup>6</sup>. Almost 50% of all cases become chronic carriers and are at risk of liver cirrhosis and liver cancer<sup>7</sup>.

Viral hepatitis during pregnancy is associated with high risk of maternal complications leading cause in maternal mortality<sup>8</sup> is also said to be the most familiar cause of jaundice in

pregnancy<sup>9</sup>. Peri-natal transmission of this disease occurs if the mother has had acute Hepatitis B infection during late pregnancy, in the first postpartum or if the mother is a chronic HBsAg carrier<sup>10</sup>. Hepatitis C transmission occurs predominantly around time of delivery and pregnancy<sup>11</sup>. Using this background information, the epidemiology of viral hepatitis during pregnancy is essential for health planners and program managers<sup>12</sup>.

## MATERIALS AND METHODS

This study was carried out in military hospital, Khartoum, Sudan. Blood samples were collected from 100 pregnant women (25 – 40 years old) who volunteered to participate in the study. Data was collected by using direct interviewing questionnaire; ethical clearance was obtained from research ethical committee of faculty of graduate studies and ministry of health Khartoum state, written consent also was obtained from Pregnant ladies.

### Experimental work

#### Samples collection:

5 ml of venous blood was collected from patients in sterile vaccotainer, the blood left for an hour at room temperature, then serum was separated using centrifuge at 5000 rpm for 20 minutes. Hepatitis B virus surface antigen (HBsAg) was examined using sandwich enzyme-linkage immunosorbent assay (ELISA) kit according to the manufacturer (Fortrees) and hepatitis C virus, the antibodies were examined using qualitative ELISA kit according to the manufacturer (Biorex-United Kingdom) instructions as follows: (the same method for both).

Serum was separated by centrifugation at 5000 rpm for 10 min. serums was kept in -20°C till serological study was performed.

Specimens were processed by Enzyme linked immune sorbent assay (ELISA) (4<sup>th</sup> generation ELISA). All reagents and samples were allowed to reach room temperature for 15minutes before use.

Washing buffer was prepared 1:20 from buffer concentrate with distilled water. The stripes was set in stripe-holder and sufficient number of wells including three negative controls (e.g.B1,C1,D1), tow positive controls (e.g.E1,F1) and one blank(e.g.E1,F1) and one blank (e.g.A1,neither samples nor HPR ). 50µl from each sample was added to the appropriate wells and mixed by pipette repeatedly until liquids turn blue. 50µl from negative and positive control was dispense and added to the negative and positive wells separately without dispensing liquid into the blank control well. 50µl of HRP-Conjugate Reagent was added in to each well except the blank, the plate was mixed well and covered with the plate cover and incubated for 60 min at 37°C.

The plate cover was removed and discarded. The liquid was aspirated and each well was rinsed in wash buffer. This step was repeated for 5 times until each well become dry.

50µl of substrate A and 50µl substrate B solution was added in to each well including the Blank and mixed by tapping the plate gently. The plate was incubated at 37°C for 15 min.

50 µl Stop solutions was added into each well and mixed gently.

**Measuring the absorbance:** The plate reader was calibrated with blank well and the absorbance was read at 450nm. The results were calculated by relating each sample optical density (OD) value to the Cut off value of plate. Calculation of Cut off (C.O) value.

$$C.O = *Nc*2.1$$

\*Nc= the mean absorbance value for the three negative controls.

The absorbance was read with micro well reader at 450nm.

### Interpretation of Results

Negative results: samples giving absorbance less than Cut-off value are negative for this assay. Positive result: sample giving absorbance equal to or greater than Cut-off considered initially reactive. Borderline: sample with absorbance to Cut-off value are considered borderline and retesting of these samples in duplicate is recommended.

### STATISTICAL ANALYSIS

The frequency of each viral infection (HBV and HCV) was determined from the proportion of the positive individuals in the total population under consideration and expressed as a percentage using SPSS.

## RESULTS

Of 100 women screened, classified into five groups according to age and three group according pregnancy status. The results showed that 3% and 1% of samples were positive to HBsAg and anti-HCV respectively (table 1). Table 2 shows the frequency of HBsAg and Anti-HCV among the women based on age groups. The highest frequency of HBsAg and Anti-HCV was observed among the age group (20-25 years). Table 3 shows the percentage of those with their pregnancy status that were positive for both HBsAg and Anti-HCV as 8.0%, 3.0% respectively, those with first trimester of pregnancy.

## DISCUSSION

Infections due to Hepatitis B and Hepatitis C viruses (HBV, HCV) are significant health problems around the globe. Worldwide, viral hepatitis is the commonest cause of hepatic dysfunction in pregnancy. In our study, the frequency of Hepatitis B and Hepatitis C among antenatal patients attending the Military Hospital Khartoum was 3% and 1% respectively. This also supports the WHO's report for Nigeria<sup>13</sup> as highly endemic area with prevalence greater than 8% for HBV.

The prevalence of HBV infection reported in this study (4.9%) was similar to results of study in different parts of Iran, including Bonab in East Azerbaijan (3.2%)<sup>14</sup>, Qazvin in Iran (3.4)<sup>15</sup>, and lower than prevalence reported in Port Harcourt and Jos (10.3%).

The anti-HCV antibody prevalence (1%) obtained in our study was similar to results of study in America (1.17%) and Europe (1.03%) but, seem to be much lower when compared with other studies from Enugu (14.9%)<sup>16</sup> Jos (5.2%) and Kaduna (11.9%)<sup>17</sup>.

In a recent study, 2439 pregnant women were screened for Hepatitis B and Hepatitis C, 2.2% of them were positive for HBsAg and 7.3% for Anti HCV. These results are higher than ours but are similar to our findings rate of HBsAg<sup>18</sup>.

**Table 1: Frequency of HBsAg and Anti-HCV in the pregnant women**

Hepatitis serology	Number of tested women	Positive result NO	(%)	Negative result	(%)
HBsAg	100	3	3.0%	97	97%
Anti-HCV	100	1	1.0%	99	99%

**Table 2: Frequency of HBsAg and Anti-HCV among the women base on age groups**

Age group (year)	Number of pregnant women	HBsAg positivity	%	Anti-HCV Positivity	%
20-25	27	2	7.0%	1	4%
25-30	32	1	3.0%	0	0.0%
30-35	29	0	0.0%	0	0.0%
35-40	9	0	0.0%	0	0.0%
40-45	3	0	0.0%	0	0.0%
<b>Total</b>	<b>100</b>	<b>3</b>		<b>1</b>	

**Table 3: Frequency of HBsAg and Anti-HCV among the women base on pregnancy status**

Pregnancy status	Number	HBsAg positive	%	Anti-HCV Positive	%
1 <sup>st</sup> time	34	3	8.0%	1	3.0%
2 <sup>nd</sup> time	41	0	0.0%	0	0.0%
3 <sup>rd</sup> time	25	0	0.0%	0	0.0%
<b>Total</b>	<b>100</b>	<b>3</b>		<b>1</b>	

This study shows that most of the patients within the 25-30 years age group followed by 20-25 years age group because this was the majority age group admitted to the antenatal clinic of the hospital. In our study most of patients were found to be prima gravidae, these findings disagree with finding reported by Awan *et al* and Ali *et al*<sup>19,20</sup>.

This Variations, noticed between our results and other results previously conducted may be related to the peculiarities in the modes of transmission of HBV and HCV dictated by socio-cultural practices environmental factors and also variety in investigational . However, comparison between our study and the others should be taken cautiously because different methods had been applied, in our study we aimed to detect antibodies using ELISA, while some of these studies, DNA of these viruses had been detected rather than antibodies. Unlike the previous reports<sup>21-23</sup> none of the expected risk factors (age, parity and the other socio-demographic characteristics) for sero-positive for HBV and HCV respectively had been identified in the current study. The explanations for such observations need to be explored in future.

### CONCLUSION

A total of 3% and 1% of the pregnant women studied were sero-positive for hepatitis B and C hepatitis respectively. Therefore , the need to institute public health measure to reduce disease burden and transmission , including routine screening of all pregnant mothers for HBV and HCV infections .

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Source of support: Nil, Conflict of interest: None Declared