Screening of Women For HIV, Hepatitis B and Hepatitis C in Antenatal Clinic

Saba Pario,[1*] Mehveen Iqbal,[1] Adeena Habib Siddiqui,[1] Sadia Suboohi,[1] Anza Kanwal,[1] Kashish Karara[1]

ABSTRACT

Objective — *To estimate the frequency of HIV, Hepatitis B, and Hepatitis C among women attending antenatal clinics in a low-income area.*

Study design — *Descriptive cross-sectional study.*

Place & Duration of study — *Antenatal clinic of United Medical and Dental College / Creek Hospital Karachi, from July 2023 to December 2023.*

Methods — *All women meeting the selection criteria were enrolled after taking informed consent. The blood samples (5 ml each) were obtained from all the participants and sent for the diagnosis of HIV, Hepatitis B, and Hepatitis C. For antibody/antigen detection, a positive result was defined by the presence of specific antibodies/antigen, as detected by electrochemiluminescence (ECL) immunoassay, with a threshold signal value of 0.9-1.0. For HIV antigen P-24 and antibody, Anti HIV1+Anti H1V2 were tested. Hepatitis B antigen and Hepatitis C antibody were also tested.*

Results — *This study enrolled 700 pregnant women with a mean age of 25.9±4.56 years. The mean age of their spouses was 30.6±5.87 years. The mean parity was 2.54±2.15 and a mean trimester duration of 4.21±2.36 months. Among the study participants one (0.1%) woman was diagnosed as having HIV, 14 (2.0%) Hepatitis C, and three (0.4%) with Hepatitis B.*

Conclusion — *A relatively low frequency of HIV and Hepatitis B were found in the pregnant women. However, Hepatitis C was notably high in this cohort of women.*

Key words — *HIV, Hepatitis C, Hepatitis B, Antenatal care.*

INTRODUCTION:

In recent years, the global healthcare community has made significant strides in combating infectious diseases, particularly those transmitted through blood and bodily fluids.[1] Among these, Human Immunodeficiency Virus (HIV) and Hepatitis B and C viruses (HBV and HCV) remain significant public health concerns, particularly in regions with high prevalence rates such as South Asia.[2] Pregnant women represent a vulnerable population, as they can transmit these infections to their offspring during pregnancy, childbirth, or breastfeeding.[3,4]

Hepatitis B virus infection is a major global public health concern, affecting on average 257 million population worldwide.[5] The pervasiveness of the Hepatitis B virus differs by region, with the higher incidence observed an South Africa and different parts of Asia.[6] In these areas, HBV is commonly transmitted from mother to child during childbirth (vertically) or through contact with infected blood or bodily fluids (horizontally). Despite the availability of a safe and effective vaccine, hepatitis B vaccination coverage remains suboptimal in many countries, contributing to ongoing transmission.[7]

Hepatitis C virus infection is another significant reason for liver diseases worldwide.[8] HCV is mainly transferred by exposure to infected blood, often as a result of unsafe phlebotomy practices,

[1]Department of Obstetrics & Gynecology, United Medical and Dental College Karachi.

Correspondence:
Dr. Saba Pario [1*]
Department of Obstetrics and Gynecology
United Medical and Dental College
Karachi
E mail: drsabapario@gmail.com

contaminated surgical equipment, or transfusion of unscreened blood. HIV/AIDS continues to be a major global challenge, particularly in Sub-Saharan Africa and various regions of Asia.[9,10]

Antenatal clinics serve as crucial platforms for the early detection, prevention, and management of infectious diseases in pregnant women. Understanding the cause of the pervasiveness of HIV, HBV, and HCV among women visiting antenatal clinics is essential for implementing effective preventive strategies and providing appropriate care to both the mother and child. The objective of this study was to estimate the frequency of HIV, Hepatitis B, and Hepatitis C among women attending antenatal clinics at a tertiary care hospital situated in a low-income locality in Karachi.

METHODS:

Study design, place and duration: This was a descriptive cross-sectional study conducted at United Medical College / Creek Hospital Karachi, from July 2023 to December 2023.

Ethical considerations: Institutional review board permission was taken (Letter no. UMDC/Ethics/2019/1/8/255/Ext-2024/09/19/367) and informed consent taken from the women.

Inclusion criteria and exclusion criteria: All pregnant women attending the antenatal clinic between 18 to 45-years of age were included. Individuals who did not consent were excluded.

Sample size estimation and sampling technique: A total of 700 women who consented to be screened through during the study period were enrolled. A convenience sampling technique was used.

Study protocol: Blood samples of 5ml were obtained from each participant for the diagnosis of HIV, Hepatitis B and Hepatitis C utilizing the electrochemiluminescence technique. For antibody/antigen detection, a positive result was defined by the presence of specific antibodies/antigen, as detected by ECL immunoassay, with a threshold signal value of 0.9-1.0. For HIV antigen P-24 and antibody Anti HIV1+Anti H1V2 were tested. In addition, Hepatitis B antigen and Hepatitis C antibody were tested. Data were collected using a pre-designed forms.

Statistical analysis:

The data were entered into SPSS Version 26. A descriptive analysis was done to present the data as mean and SD, frequency and percentages.

RESULTS:

The mean age of the 700 pregnant women enrolled was 25.9±4.56 years. The mean age of the spouse, parity and trimester were 30.6±5.87 years, 2.54±2.15 and 4.21±2.36 months respectively. Out of total patients, only one (0.1%) patients was diagnosed with HIV, 14 (2.0%) patients with Hepatitis C and three (0.4%) with Hepatitis B. The married women (n=694 - 99.1%) predominated while six

Table I: Characteristics of the Study Participants

Education level	Frequency (%)
Illiterate	15 (02.1%)
Primary	142 (20.3%)
Secondary	271(38.7%)
Intermediate	141(20.1%)
Bachelor	106 (15.1%)
Master	20 (02.9%)
MBBS	02 (0.3%)
Hafiz Quran	03 (0.4%)
Age Groups	
18-30 years	608 (86.9%)
31-40 years	92(13.1%)
Ethnicity	
Sindhi	335 (47.9%)
Pathan	192 (27.4%)
Punjabi	114 (16.3%)
Afghani	59 (8.4%)

(0.9%) were divorced recently. In terms of health-related factors, 64 (9.1%) had received blood transfusions, 17 (2.4%) travelled abroad, 19 (2.7%) were intravenous (IV) drug abuser, and 23 (3.3%) received IV medications. Majority of the participants were housewives (n=611 - 87.3%). The demographic details are given in table I.

DISCUSSION:

The findings of the present study highlight the frequency of HIV, Hepatitis B, and Hepatitis C infections among pregnant females coming for their antenatal check-up at a tertiary care center in a low-income area of Karachi. This information is crucial for understanding the epidemiological landscape of these infections in a vulnerable population. This also guides policy makers in devising public health strategies to avoid further transmission in general population as well as obstetricians to take measures in preventing spread of disease from mother to the child.

According to Hajira et al the frequency of Hepatitis C virus in pregnant women was 8.66%.[11] A review by Shah et al reported the HCV incidence among pregnant women in Pakistan from different studies ranged from 0.7% to 20%.[12] This was similar to another study from Karachi where a frequency of 9.2% was reported.[13] However, Kumar et al found a significantly lower prevalence of 1.03% from India.[14] Hepatitis C remains an endemic issue in underdeveloped countries such as Pakistan, where its seroprevalence is up to twenty times higher than in developed countries.[15]

Hepatitis B virus infection is a major global public health concern, particularly for pregnant women due to the risk of transmission during childbirth. The incidence of HBV among pregnant women varies widely by region, with rates reaching 15% to 20% in high-endemic areas.[16] our data showed a low frequency of Hepatitis B as reported previously.[17]

Despite being relatively lower than HBV and HCV, the prevalence of HIV in the study population is of concern. Our results align with national data indicating lower but notable HIV prevalence in pregnant women in Pakistan. Routine HIV screening in antenatal care is crucial for early diagnosis and initiation of antiretroviral therapy. This can improve health outcomes for both mothers and infants. The prevalence of HIV among pregnant women is relatively low but rising. The National AIDS Control Program in Pakistan has reported varying HIV incidence rates among pregnant women across different regions, with some areas showing rates as low as 0.1% to 0.5%.[18] Research by Khan et al reported a slightly higher prevalence of about 0.5%, emphasizing the need for targeted interventions in urban areas.[19]

Our study findings highlight the importance of continuous screening and suggests preventive measures to reduce the transmission of these infections among pregnant women in this region. The higher rate of Hepatitis C suggests the need for targeted interventions, including public health education. These measures can help mitigate the risk of transmission from mother to child and improve the health of mother and neonates.

Limitations of the study: The study was from a single center based upon data collected over a period of six months only. However, it is from a low-income suburb of Karachi with women representing diverse ethnic groups. A population based data can provide more convincing information related to the infectious diseases.

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CONCLUSION:

The results revealed a relatively lower frequency of HIV and Hepatitis B among pregnant women. However, the prevalence of Hepatitis C was quite high.

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Authors' contributions:
Saba Pario: Concept, data collection, drafting
Mehveen Iqbal: Data collection and analysis.
Adeena Habib Siddiqui: Data collections and drafting
Sadia Suboohi: Design of study and manuscript writing.
Anza Kanwal: Data collections and drafting
Kashish Karara: Data collections and drafting

All authors are involved in manuscript writing, revising and accountable for the data provided in the manuscript.

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