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FREQUENCY OF HUMAN IMMUNO-DEFICIENCY VIRUS IN PREGNANT WOMEN

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ABSTRACT

Objective: To determine the frequency of human immunodeficiency virus infection among pregnant women attending antenatal care and to identify associated demographic and clinical risk factors.
Methodology: This cross-sectional study was conducted at the Obstetrics and Gynecology Department, Shaikh Zaid Women Hospital, Larkana, A total of 457 pregnant women aged 18–40 years attending antenatal clinics for routine antenatal checkups were included through non-probability consecutive sampling. Apparently healthy pregnant women of any gestational age, irrespective of parity, were enrolled after informed consent.
Results: A total of 457 pregnant women with a mean age of 28.84 ± 5.96 years were included in the study. The mean gestational age was 25.1 ± 8.7 weeks. Most participants were multiparous (69.6%), housewives (86.2%), and belonged to low socioeconomic backgrounds (52.3%). HIV seropositivity was detected in 23 women, giving an overall frequency of 5.0%. HIV positivity was significantly higher among women aged 33–40 years (11.4%), multiparous women (6.0%), illiterate participants (8.4%), women with prior blood transfusion history (16.3%), and those from low socioeconomic backgrounds (6.7%) ($p < 0.05$).
Conclusion: The frequency of HIV infection among pregnant women was 5.0%, indicating a significant burden in the studied population. Routine antenatal HIV screening and targeted preventive strategies for high-risk women are essential to reduce maternal HIV burden and prevent mother-to-child transmission.

INTRODUCTION

The problem of human immunodeficiency virus (HIV) infection among pregnant women has become a serious medical and social problem all over the world [1, 2]. The number of women infected with HIV who give birth each year is estimated to be 1.3 million worldwide [3]. HIV in pregnant women may get firstly diagnosed during pregnancy or including close to the time of delivery [4]. As a result, asymptomatic or early stage of infection women are an enormous risk to babies, families and health care personnel [1, 5]. People living with HIV have different risks of poor pregnancy outcome. Associated poor outcomes that are known to occur include increased spontaneous miscarriage rate, stillbirth, increased perinatal mortality, intrauterine growth restriction, low birth weight and chorioamnionitis [6, 7].

HIV infection in pregnancy has become the leading cause of death in women of reproductive age [8]. About risk of maternal death tends to increase eightfold in pregnant women with HIV [9]. Approximately 5,000 women in the U.S. are born with HIV each year [10]. Similarly in sub-Saharan Africa (SSA) with women constituting 60% of all those infected with HIV [8] and Nigeria accounts for 10% of the HIV burden globally [11]. Similarly, in the study reported by Likeliwe Karena ZV, 0.22% of 50 antenatal women were positive for HIV infection [12]. There are some studies in which incidence of HIV was 5.1% and 8.5% [13, 14].

HIV infection complications to pregnancy and liability of Mother-to-Child-Transmission (MTCT) upholds screening of infections being a vital component of antenatal care for all pregnant women [15-18]. In high prevalence areas (high prevalence > 5%), provider-initiated testing and counselling (PITC) for HIV is recommended to be a routine part of the package of care in all antenatal care services. PITC may be viewed as an essential part of the maternal and child health system in low prevalence (LP) sites (<5%) where it can be combined with testing for syphilis and other tests as appropriate, to bolster the health care system [19]. Provide the information and resources needed to enable pregnant HIV-positive women to take action to safeguard their health and that of their unborn children. Hence, the current study aims to evaluate the prevalence of HIV in the asymptomatic antenatal women attending Shaikh Zaid women hospital in Larkana. Thus early HIV diagnosis and

rapid treatment will decrease vertical transmission of HIV and other morbidity and mortality of pregnant women and prevent HIV transmission from the mother to the fetus.

OBJECTIVE

To determine the frequency of human immunodeficiency virus **(**HIV) in pregnant women.

METHODOLOGY

This is a Cross-sectional study conducted at obstetrics and gynecology department, Shaikh Zaid women hospital Larkana from 20th October 2024 to 20th April 2025**.** The sample size was calculated using the WHO sample size calculator, with the expected proportion of HIV among pregnant women set at 5% [13], a 95% confidence level, and a 2% margin of error. The desired sample size was determined to be 457 pregnant women. Consecutive sampling (non-probability sampling technique) was used. The study included pregnant women aged 18–40 years. Eligible women were all apparently healthy pregnant women (any gestation) attending the antenatal clinic for routine antenatal checkup. All cases, including primiparous, multiparous, elective and emergency, were included. Only women who gave written informed consent were enrolled. Women with history of any pre-existing medical conditions like diabetes mellitus, chronic hypertension, endocrine disorder or anemia were excluded. Women who are currently using antibiotics or had a history of autoimmune or immunosuppressive disease or women using immunosuppressive medication were not included. Records were incomplete or of poor quality with cases excluded.

Data Collection

Pregnant women, both primigravida and multigravida, of age 18-40 years attending the ANTENatal clinic of Obstetrics and Gynecology Department at Shaikh Zaid Women Hospital, Larkana were recruited after approval by the Institutional Review Board and College of Physicians and Surgeons Pakistan. Informed consent, written, was obtained from all participants. The researcher used a predesigned proforma to record the demographic and clinical data, such as age, gestational age, parity, education, employment status, socioeconomic status based on family income, previous surgical history and history of blood transfusion. Laboratory tests were performed on each participant in relation to. Five milliliters (5 mL) of venous blood was obtained sterilely, and analyzed for HIV infection antibodies using a chromatographic method. ELISA was used to confirm the samples that were reactive on the chromatographic results. The pathologist who performed reporting of chromatographic and ELISA tests has over 5 years of post-fellowship experience. All the patients' information was kept confidential, and the HIV-positive participants were treated according to standard treatment protocols.

Data Analysis

SPSS version 19 was used for data analysis. The Shapiro-Wilk test was used to check normality of quantitative variables (age and gestational age). Data were presented as mean ± standard deviation for normally distributed data and as median with interquartile range for data which were not normally distributed. Qualitative variables like parity, education, socioeconomic status, previous history of surgery, history of blood transfusion, occupation, and HIV seropositivity were given as frequencies and percentages. Potential effect modifiers, such as age, parity, gestational age, educational level, previous history of surgery, blood transfusion, occupation, and socioeconomic status were controlled in the stratification process. Post-stratification chi-square test. A p value of ≤ 0.05 was used as the cutoff value for statistical significance.

RESULTS

A total of 457 participants were included in the study. Table I shows that the mean age of pregnant women was 28.84 ± 5.96 years. Most women were aged 26–32 years, 205 (44.9%), followed by 18–25 years, 164 (35.9%), and 33–40 years, 88 (19.3%). The mean gestational age was 25.1 ± 8.7 weeks. Most participants were in the second trimester, 221 (48.4%), followed by third trimester, 144 (31.5%), and first trimester, 92 (20.1%). Multiparous women were more common, 318 (69.6%), while 139 (30.4%) were primigravida. Most women were housewives, 394 (86.2%), and 63 (13.8%) were employed.

Table I. Baseline Demographic and Obstetric Characteristics of Pregnant Women

Variable	Category	n (%) / Mean ± SD
Age (years)	Mean ± SD	28.84 ± 5.96
Age group	18–25 years	164 (35.9%)
	26–32 years	205 (44.9%)
	33–40 years	88 (19.3%)
Gestational age (weeks)	Mean ± SD	25.1 ± 8.7
Gestational age	First trimester	92 (20.1%)
	Second trimester	221 (48.4%)
	Third trimester	144 (31.5%)
Parity	Primigravida	139 (30.4%)
	Multiparous	318 (69.6%)

Employment status	Housewife	394 (86.2%)
	Employed	63 (13.8%)

Table II demonstrates that 178 (38.9%) women were illiterate, 124 (27.1%) had primary education, 99 (21.7%) had secondary education, and 56 (12.3%) were graduates or above. Regarding socioeconomic status, 239 (52.3%) belonged to the low socioeconomic group, 163 (35.7%) to the middle group, and 55 (12.0%) to the high group. Previous surgery was reported by 122 (26.7%) women, while 335 (73.3%) had no surgical history. Blood transfusion history was present in 49 (10.7%) women and absent in 408 (89.3%).

Table II. Socioeconomic and Clinical Characteristics

Variable	Category	n (%)
Education status	Illiterate	178 (38.9%)
	Primary	124 (27.1%)
	Secondary	99 (21.7%)
	Graduate or above	56 (12.3%)
Socioeconomic status	Low	239 (52.3%)
	Middle	163 (35.7%)
	High	55 (12.0%)
Previous surgery history	Yes	122 (26.7%)
	No	335 (73.3%)
Blood transfusion history	Yes	49 (10.7%)
	No	408 (89.3%)

Table III shows that HIV seropositivity was found in 23 (5.0%) pregnant women, while 434 (95.0%) were HIV negative.

Table III. Frequency of HIV Seropositivity Among Pregnant Women

Variable	Category	n (%)
HIV serostatus	Positive	23 (5.0%)
	Negative	434 (95.0%)

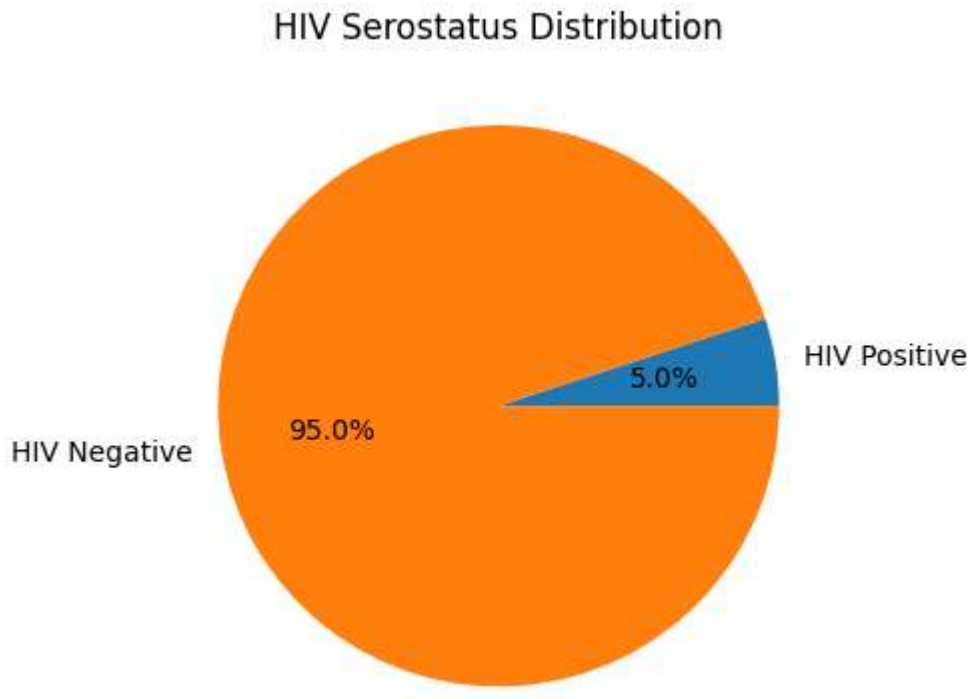

Table IV shows significant associations between HIV seropositivity and age group, parity, education, blood transfusion history, and socioeconomic status. HIV positivity was highest among women aged 33–40 years, 10 (11.4%), compared with 8 (3.9%) in the 26–32 years group and 5 (3.0%) in the 18–25 years group (p=0.028). Multiparous women had higher HIV positivity, 19 (6.0%), compared with primigravida women, 4 (2.9%) (p=0.019). Illiterate women had higher HIV positivity, 15 (8.4%), compared with literate women, 8 (2.9%) (p=0.009). Women with a history of blood transfusion had markedly higher HIV positivity, 8 (16.3%), compared

with those without transfusion history, 15 (3.7%) (p<0.001). HIV positivity was also higher among women from low socioeconomic status, 16 (6.7%), compared with middle/high socioeconomic status, 7 (3.2%) (p=0.014).

Table IV. Stratification of HIV Seropositivity with Demographic and Clinical Variables

Variable	Category	HIV Positive n (%)	HIV Negative n (%)	p-value
Age group	18–25 years	5 (3.0%)	159 (97.0%)	0.028
	26–32 years	8 (3.9%)	197 (96.1%)	
	33–40 years	10 (11.4%)	78 (88.6%)	
Parity	Primigravida	4 (2.9%)	135 (97.1%)	0.019
	Multiparous	19 (6.0%)	299 (94.0%)	
Education	Illiterate	15 (8.4%)	163 (91.6%)	0.009
	Literate	8 (2.9%)	271 (97.1%)	
Blood transfusion history	Yes	8 (16.3%)	41 (83.7%)	<0.001
	No	15 (3.7%)	393 (96.3%)	
Socioeconomic status	Low	16 (6.7%)	223 (93.3%)	0.014
	Middle/High	7 (3.2%)	211 (96.8%)	

Table V shows that previous blood transfusion was the strongest independent predictor of HIV seropositivity, with an adjusted odds ratio of 4.89 (95% CI: 1.96–12.18, p<0.001). Illiteracy was also significantly associated with HIV positivity, adjusted OR 2.94 (95% CI: 1.34–6.42, p=0.007), followed by age >32 years, adjusted OR 2.68 (95% CI: 1.19–5.98, p=0.017), low socioeconomic status, adjusted OR 2.33 (95% CI: 1.08–5.01, p=0.031), and multiparity, adjusted OR 2.21 (95% CI: 1.03–4.74, p=0.041).

Table V. Multivariable Logistic Regression Analysis for HIV Seropositivity

Variable	Adjusted OR (95% CI)	p-value
Age >32 years	2.68 (1.19–5.98)	0.017
Multiparity	2.21 (1.03–4.74)	0.041
Illiteracy	2.94 (1.34–6.42)	0.007
Previous blood transfusion	4.89 (1.96–12.18)	<0.001
Low socioeconomic status	2.33 (1.08–5.01)	0.031

DISCUSSION

In the present study, the frequency of human immunodeficiency virus (HIV) infection was evaluated among the pregnant women attending the antenatal care services and the result revealed that the overall frequency of HIV seropositive women was 5.0% (23/457). This is an important finding because it shows there is a significant burden of HIV infection in the studied antenatal population, and routine screening during pregnancy is important to enable early diagnosis and to prevent mother-to-child transmission. HIV infection is at risk of being diagnosed in pregnancy, especially in resource-limited areas where women might not have had many opportunities for testing before becoming pregnant. The prevalence of HIV in this study was higher than in several other studies conducted in lower-prevalence areas with HIV seroprevalence among pregnant women ranging from 0.5% to 3.0%. However, previous research from areas with increased disease burden and socioeconomic disparities has demonstrated comparable frequencies. This relatively high frequency in the present study could be due to regional epidemiological patterns, socioeconomic deprivation, lack of awareness, delayed health service utilization, and screening practices [15].

There was a significant association between HIV seropositivity and age. The positivity rate was highest among women aged 33–40 years, compared to other age groups, and multivariable analyses identified advanced maternal age as an independent predictor of HIV infection. This result agrees with earlier studies indicating that older reproductive-age women could potentially be exposed to more of these risk factors over time, making them more vulnerable to infection from them. There was also a statistically significant association with HIV positivity, with multiparous women having a higher HIV positivity rate than primigravida women, in this regard parity also showed a relationship with HIV positivity. In the regression analysis, multiparity continued to be a strong independent predictor. These results have been documented in other studies, which have shown that repeated pregnancies and greater exposure to health care environments may lead to increased cumulative exposure to potential risk factors. Multiparity can also be a surrogate measure of sexual exposure over a longer period of time and increased exposure to obstetric interventions [16].

In the present study, education level was one of the factors that were identified as being important for the determination of HIV infection. HIV seropositivity was significantly higher among the illiterate women than among the well-educated women, and illiteracy was a significant risk of HIV infection independent of the other factors. This is supported by earlier studies which have suggested that lower level of education is strongly linked

to poor knowledge about STIs, less knowledge about prevention, less availability to health services, and delayed usage of antenatal screening services [17]. Educational empowerment continues to be an important component in reducing HIV transmission risk. In this study, the highest association with HIV seropositivity was found with history of blood transfusion. The infections were significantly higher among women with history of transfusion than among women without such history, and blood transfusion was the most important predictor of HIV infection on regression analysis [18]. This is like what has been reported in previous studies, especially in environments where transfusion safety practices might not be consistently adhered to. It highlights the importance of donor screening, safe blood transfusion practice, and quality control of blood banking practice. Socio-economic status was also significantly associated with HIV infection, with the lower SE status group having higher HIV seropositivity than the middle and high SE status groups. Being poor was a risk factor for HIV infection, independent of other risk factors [19]. This relationship has been confirmed in previous studies, which show that poverty reduces the ability to access health care, preventive awareness, to understand health information, and to seek medical help in time. Risk factors for infection transmission can also be indirect social and environmental risks, which can be exacerbated by financial vulnerability. The pooled results of this study indicate that several demographic, educational, and health care factors affect the risk of HIV infection for pregnant women. The associated factors identified are clinically relevant as a basis for targeted antenatal screening and risk-based counseling to enhance early diagnosis and reduce vertical transmission. There is a need to continue to promote routine HIV testing during antenatal services, especially in high-risk groups to improve maternal and neonatal outcomes [20].

Limitations

There are several limitations with this study. The results of this single-center cross-sectional study may not be representative of the wider pregnant population in other areas or health care systems. The cross sectional approach only establishes frequency and association but cannot make any causal conclusions or temporal associations between identified risk factors and HIV infection. Non-probability consecutive sampling may lead to selection bias. The associations observed may have been affected by the lack of full assessment of certain risk factors, such as sexual behavior, HIV status of the partner, and prior sexually transmitted infections. In addition, there is the possibility of recall or reporting bias because the clinical and social history is obtained from a participant. Nevertheless, the study has valuable local epidemiological information on the prevalence of HIV in pregnant women and the factors associated with it that need to be explored.

CONCLUSION

The present study concluded that the frequency of human immunodeficiency virus infection among pregnant women was 5.0%, indicating a considerable burden in the studied population. HIV seropositivity was significantly associated with advanced maternal age, multiparity, illiteracy, previous history of blood transfusion, and low socioeconomic status. Routine antenatal HIV screening, early identification of high-risk pregnant women, improved public health awareness, and strengthening of preventive healthcare strategies are essential to reduce maternal HIV burden and prevent mother-to-child transmission.

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