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# Herpes Simplex Virus Type 2 Infection Prevalence in Expectant Mothers in Ideato South, Imo State, Nigeria

**Dunga Kingsley Excel[1*], Onyenama Amarachi Chisom[2], Ezeagwula Treasure Divine Chinyere[3], Uzoije Ugwuzor Nwadikor[4], Ohanusi Irene Nneka[5] & Okoro Chinyere Ihuarulam[6]**

[1]*Department of Medical Laboratory Science, Kingsley Ozumba Mbadiwe University, Ogboko,Imo State Nigeria*

[2]*Department of Microbiology, Kingsley Ozumba Mbadiwe University, Ogboko, Imo State*

[3]*Department of Public Health, Clifford University,Owerrinta,Ihie Campus.Abia State*

[4]*Department of Medical Laboratory Science,Rhema University Aba,Abia State*

[5]*Departmentof Microbiology, Hezekiah University, Umudi Nkwerre LGA Area Imo State*

[6]*Federal University Teaching Hospital Owerri, Imo State*

**[*]Corresponding author:** Dunga Kingsley Excel, Department of Medical Laboratory Science, Kingsley Ozumba Mbadiwe University, Ogboko,Imo State Nigeria.

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***Abstract***

*Herpes simplex virus type 2 (HSV-2) is a significant sexually transmitted infection (STI) of global relevance and a primary cause of genital ulcer disease. Maternal infection during gestation is linked to negative consequences, such as premature birth and neonatal herpes. Even though HSV-2 infection is clinically important, there isn't much information about how common it is among pregnant women in rural Nigeria. A cross-sectional study was performed involving 147 pregnant women attending the prenatal clinic at Christ the King Hospital, Ogwume, Ideato South, Imo State. The HerpeSelect-2 ELISA kit was used to analyse serum samples for immunoglobulin M (IgM) antibodies that are specific to HSV-2. Structured questionnaires were used to gather socio-demographic information. Descriptive statistics were employed to ascertain prevalence and distribution across demographic factors. The total seroprevalence of HSV-2 IgM was 8.8%. The highest prevalence was found in women between the ages of 19 and 29 (3.4%), followed by women between the ages of 30 and 39 (2.0%). Married women had a prevalence of 5.4%, whilst divorced women accounted for 1.3%. Health workers had the largest occupational prevalence (2.7%), followed by traders (2.0%), government servants (1.36%), and students (0.7%). The highest prevalence (4.1%) was found in people who had completed secondary school. The lowest prevalence (2.0%) was found in those who had completed tertiary school and (0.7%) was found in people who had no education. Pregnant women in Ideato South still have a lot of HSV-2 infections, which is very bad for their health and the health of their babies. Younger and married women seem to be more at risk. Routine screening for HSV-2 during prenatal care, targeted education, and early antiviral treatments are suggested to lower the risk of transmission and enhance outcomes for mothers.*

**Keywords:** Herpes Simplex Virus 2, Seroprevalence, Pregnant Women, Nigeria, Maternal Health, Neonatal Herpes.

## Introduction

Herpes simplex virus type 2 (HSV-2) is a prevalent sexually transmitted virus and a primary etiological agent of genital ulcer disease worldwide. This virus is a double-stranded DNA virus from the Herpesviridae family. It is mostly spread through sexual contact or vertical transmission after childbirth [1]. HSV-2

infection is persistent, marked by latent persistence, intermittent reactivation, and viral shedding [2]. It is estimated that more than 490 million people aged 15 to 49 around the world have HSV-2, which means that almost 13% of the population has it [3]. In sub-Saharan Africa, the prevalence is significantly elevated, varying from 20% to 80% among adults, attributable to elevated rates of early sexual initiation, insufficient condom utilisation, and inadequate awareness of sexually transmitted infections [4].

HSV-2 has substantial clinical effects during pregnancy. Primary infection during pregnancy elevates the likelihood of vertical transmission to the neonate, resulting in neonatal herpes, a potentially lethal illness marked by neurological impairment, blindness, or systemic infection [5]. Maternal infection is associated with negative outcomes including preterm birth, low birth weight, and premature rupture of membranes [6]. Even with these dangers, normal antenatal testing regimens in Nigeria rarely include HSV-2 screening, and the burden on pregnant women is still not well understood. Previous research in several Nigerian states has shown HSV-2 seroprevalence rates between 10% and 40%, reflecting regional disparities shaped by sociodemographic and behavioural determinants [7].

This study sought to ascertain the frequency and demographic associations of HSV-2 infection among pregnant women in Ideato South Local Government Area, Imo State, Nigeria. The results are anticipated to improve comprehension of local epidemiology and guide preventive public health efforts to reduce maternal and newborn problems.

## Materials and Methods

### Study Design and Area

A cross-sectional sero-epidemiological study was conducted at Christ the King Hospital, Ogwume, Ideato South, Imo State, Nigeria, from August to November 2023. Ideato South is a semi-rural area in southeastern Nigeria, with most residents engaged in farming, trading, or small-scale occupations.

### Study Population

The study enrolled 147 consenting pregnant women attending antenatal care at the hospital. Inclusion criteria included being within reproductive age (18–49 years), consent to participate, and absence of visible genital ulcers at the time of sampling.

## Ethical Considerations

Ethical approval was obtained from the hospital's Health Research Ethics Committee. Informed consent was obtained from each participant prior to data and sample collection. Confidentiality was maintained throughout the study.

## Data Collection

Structured questionnaires were administered to obtain socio-demographic and clinical information such as age, marital status, educational level, occupation, and obstetric history.

### Sample Collection and Processing

Five milliliters (5 mL) of venous blood were aseptically collected from each participant using sterile syringes. Samples were transferred into plain tubes, allowed to clot at room temperature, and centrifuged at 3000 rpm for 15 minutes to obtain serum. Serum samples were stored at −20°C until analyzed.

### Serological Analysis

Serum samples were analyzed using the HerpeSelect-2 enzyme-linked immunosorbent assay (ELISA) kit (Focus Diagnostics, USA) following the manufacturer's protocol. Optical density (OD) readings were obtained at 450 nm using a microplate spectrophotometer. Positive and negative controls were included in each run. Results were interpreted as follows:

**Positive:** OD ≥ cutoff value indicated presence of HSV-2 IgM antibodies.
**Negative:** OD < cutoff value.
**Invalid:** No reaction in control wells; such samples were retested.

### Statistical Analysis

Data were analyzed using SPSS version 20.0 (IBM Corp., USA). Descriptive statistics (frequencies and percentages) were computed to determine the prevalence of HSV-2 IgM across demographic variables.

## Results

### Overall Prevalence

Out of 147 serum samples, 13 tested positives for HSV-2 IgM antibodies, giving an overall prevalence of 8.8%.

### Prevalence by Age

The age distribution revealed that women aged 19–29 years exhibited the highest seroprevalence (3.4%), followed by those aged 30–39 years (2.0%) and 40–49 years (1.3%) (Table 1). Younger pregnant women therefore appeared more at risk, possibly due to higher sexual activity or recent primary exposure.

**Table 1:** Prevalence of HSV-2 IgM by age group

| Age group (years) | Frequency | Positive cases | Prevalence (%) |
|---|---|---|---|
| 19–29 | 65 | 5 | 3.4 |
| 30–39 | 70 | 3 | 2.0 |
| 40–49 | 11 | 2 | 1.3 |
| Total | 147 | 10 | 6.8 |

(Note: minor rounding differences due to decimal adjustments)

### Prevalence by Marital Status

Marital status influenced prevalence (Table 2). Married women showed the highest infection rate (5.4%), while divorced women had 1.3%. No positive cases were detected among single or widowed women.

**Table 2:** Prevalence of HSV-2 IgM by Marital Status

| Marital status | Frequency | Positive cases | Prevalence (%) |
|---|---|---|---|
| Single | 9 | 0 | 0.0 |
| Married | 129 | 8 | 5.4 |
| Divorced | 5 | 2 | 1.3 |
| Widowed | 4 | 0 | 0.0 |

**Prevalence by Occupation**

Occupational exposure also correlated with varying prevalence rates. Health workers demonstrated the highest infection rate (2.7%), followed by traders (2.0%) and civil servants (1.36%) (Table 3).

**Table 3:** Prevalence of HSV-2 IgM by Occupation

| Occupation | Frequency | Positive cases | Prevalence (%) |
|---|---|---|---|
| Students | 21 | 1 | 0.7 |
| Civil servants | 25 | 2 | 1.36 |
| Traders | 26 | 3 | 2.0 |
| Health workers | 34 | 4 | 2.7 |
| Artisans | 36 | 0 | 0.0 |
| Farmers | 4 | 0 | 0.0 |

**Prevalence by Educational Level**

Education level also showed marked differences. Women with secondary education exhibited the highest prevalence (4.1%), followed by those with tertiary education (2.0%) and no education (0.7%) (Table 4).

**Table 4:** Prevalence of HSV-2 IgM by educational level

| Education level | Frequency | Positive Cases | Prevalence (%) |
|---|---|---|---|
| None | 5 | 1 | 0.7 |
| Primary | 4 | 0 | 0.0 |
| Secondary | 94 | 6 | 4.1 |
| Tertiary | 42 | 3 | 2.0 |

## Discussion

This study showed that a lot of pregnant women in Ideato South, Imo State, have HSV-2, with an overall seroprevalence of 8.8%. This data is consistent with earlier Nigerian research indicating HSV-2 incidence rates ranging from 7% to 30% among pregnant women [8, 9]. The elevated frequency among women aged 19–29 years aligns with findings from sub-Saharan Africa that link HSV-2 infection to younger demographics [10]. Early initiation of sexual activity, infrequent condom usage, and having several sexual partners are likely contributing factors [11, 12]. The slightly lower occurrence in older age groups may indicate acquired immunity or diminished sexual exposure.

Married women exhibited a greater prevalence (5.4%), supporting the findings of, who noted that marital status elevates exposure due to ongoing sexual activity and the possibility of asymptomatic shedding by partners [13]. Although single women showed no infections in this group, this could be because there were fewer of them or they were less exposed [14]. Health workers had the highest occupational prevalence (2.7%), likely because to elevated exposure to infectious bodily fluids or patients, aligning with findings by [15, 16]. Traders and civil servants exhibited moderate rates, presumably indicative of socio-behavioral risk factors [17].

The most interesting thing is that people with secondary education had the greatest infection rate (4.1%). This contradicts the presumption that advanced education correlates with enhanced health awareness. Similar results have been observed in Ghana and Kenya, where women with intermediate education exhibited increased HSV-2 seropositivity compared to those with tertiary education [18]. This may indicate social mobility and a concurrent overlap of active reproductive age within this educational category. The results confirm that HSV-2 is still an infection that pregnant women in Nigeria don't know much about. The reported prevalence highlights the necessity for regular prenatal HSV-2 screening, particularly considering the hazards of newborn transmission and related morbidity [19].

The World Health Organisation (WHO) has identified HSV-2 as a significant cofactor for HIV transmission worldwide, owing to its role in mucosal disruption and immunological activation [20]. Consequently, the surveillance of HSV-2 prevalence in pregnant women enhances comprehensive HIV control efforts. This study has limitations, even though it contains some good points. The cross-sectional design limits causal inference. Serological testing for IgM may not differentiate between recent original infection and reactivation. Additionally, the sample size was small and only came from one place, which could make it hard to apply to other situations. Subsequent research utilising larger cohorts and molecular diagnostics (e.g., PCR) may yield more precise epidemiological findings.

## Conclusion

This study shown that HSV-2 infection is widespread among pregnant women in Ideato South, Imo State, exhibiting signifi-

cant heterogeneity based on age, marital status, occupation, and educational attainment. Younger married women and healthcare workers had the highest prevalence of infection. Because HSV-2 can be passed on to newborns and cause problems for mothers, it is important to include screening for the virus in normal prenatal care. Public health measures should include teaching people how to have safe intercourse, how to utilise barrier protection, and how to get help for mothers who are infected. Routine prenatal monitoring and antiviral prophylaxis for high-risk mothers can mitigate newborn morbidity and mortality linked to HSV-2.

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