

## Commentary: Sero-Prevalence of Herpes Simplex Virus Type 1 and Type 2 Among Women Attending Routine Cervical Care Clinics in Ghana

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### Abstract

Herpes Simplex Virus (HSV) infection is a public health problem globally and particularly in developing populations. In 2012, the World Health Organization (WHO) estimated the prevalence of the commonest subtypes, HSV-1 and HSV-2, globally and by WHO regions. The highest prevalence of herpes infection was reported in Africa, 87.0% for HSV-1 and 31.5% for HSV-2 [1,2]. Additionally, the number of new infections was estimated to be approximately 118 million (with 57 million women) and 19.2 million (with 11.8 million women) for HSV-1 and for HSV-2, respectively [1,2].

**Keywords:** Ghana; Herpes Simplex Virus; Sero-Prevalence

HSV-1 is primarily transmitted by oral-oral contact, whereas HSV-2 is primarily transmitted sexually [3]. However, HSV-1 can have a relative contribution to genital infection through oral sex [4,5]. Consequently, genital HSV infection is the most common Sexually Transmitted Infection (STI) among women ; for both HSV-1 and HSV-2, women have a greater biological susceptibility to acquire the infections than their male counterparts [2,5]. This always makes HSV an important contextual factor for making decisions regarding women's reproductive and sexual health. It is thought that genital ulcerations resulting from herpetic lesions may increase a woman's susceptibility for persistent Human Papillomavirus (HPV) infection that may lead to cervical cancer, Human Immunodeficiency Virus (HIV) infection and subsequent immunosuppression or instigate spontaneous abortions [6,7,8,9]. All these conditions are disproportionately more prevalent in sub-Saharan Africa, yet there is poor data availability on HSV infections among women in sub-Saharan Africa and little is known about potential associations. This problem is even more significant for HSV-1 infection compared to HSV-2 infection because the few existing studies have focused on just HSV-2.

Debrah et al. (2018) in their cross-sectional descriptive study published in "BMC Infectious

Diseases” estimated the sero-prevalence of HSV-1 and HSV-2 among asymptomatic women presenting at Cervicare clinics located in the two major cities (Accra and Kumasi) in Ghana. The study reported a high prevalence of HSV-1 and HSV-2 infection among women in Ghana (99.2% and 78.4% respectively). The high rate of infections is rather alarming. In this commentary, we shed some light on the potential implications of their findings for public health management in similar settings in Sub-Saharan Africa [10].

Any report of a high prevalence of herpes infections among women attending cervical screening in the reproductive and child healthcare section of hospitals is significant because most women are of reproductive age. Due to the high incidence of genital herpes in the population, it is important to focus on the herpes simplex viruses and their potential impact on pregnancy. Approximately 10% of pregnant women are at risk for acquisition of genital herpes [11]. In general, prevalence of genital herpes among pregnant women in Sub-Sahara Africa is reported to be high and urgent intervention is needed. Kwofie and colleagues (2015) reported the prevalence of HSV-2 IgG among pregnant women in Ghana as 68.1 % (95% CI: 57.5% - 77.5%) [12]. In Nigeria the prevalence of HSV-2 among pregnant women was 47.3%, with majority of the seropositive participants in their third trimester [13]. Similar findings have been published from South-Western Nigeria- 33.3% [14], Zimbabwe - 49.1% [15] and Tanzania - 20.7% [16]. Lower prevalence of HSV-2 infection among pregnant women were reported in other parts of the world: Indonesia- 9.9% [17], China- 10.8% [18], and India- 8.7% [19].

Primary infection with either HSV-1 or HSV-2 before 20<sup>th</sup> week of gestation may be associated with miscarriage [8]. In the second and third trimesters of pregnancy presence of the herpes infection may be associated with preterm delivery and with the highest risk to the infant [20]. The possibility of mother-to-child transmission of the virus, makes the report by Debrah and colleagues in a reproductive health setting significant. Neonatal HSV infection may manifest as a range of diseases including mildly annoying skin, eye, and mouth infection that is rarely fatal, although up to 38% may develop neurological disease as a sequela; central nervous system disease (manifested as encephalitis with or without skin, eye, and mouth infection); and serious disseminated disease which has a 90% mortality rate if untreated [21,22]. In rare cases, there is transplacental transmission resulting in congenital (in utero) herpes infection. This is typically very severe. The fetal manifestations include microcephaly, hepatosplenomegaly, Intrauterine Growth Restriction (IUGR), and Intrauterine Fetal Death (IUFD). It remains to be seen what the impact of herpes infection on these is but the study by Debrah et al., has certainly strengthened the justification for studies among women with HPV coinfection, HIV coinfection or pregnant women in the Sub-Region to address some of these vital questions.

Aside assay characteristics which has been sufficiently pointed out [10], a high prevalence of herpes infection may probably be due to high transmission of virus in a highly susceptible population. It is an established fact that humans are the only known host for herpes viruses [23]. Therefore, the nature of the infection must be such that it results in a latent state that favors virus development. Indeed, only one-third of individuals appear to develop symptoms during acquisition of infection [24]. Upon infection, the virus becomes latent and reactivation occurs periodically and can present as symptomatic lesions, especially in immunosuppressed individuals [24]. In most asymptomatic cases, transmission of virus continues even in the absence of symptoms mediated through viral shedding. This phenomenon, if unchallenged by improving women’s knowledge regarding sexual and reproductive habits can sustain and worsen the existing epidemic of HSV infection [25].

As genital herpes infection is mostly transmitted sexually, the risk of HSV acquisition depends on a person’s level of sexual activity and the number of partners, as well as a background

prevalence of infection in the community. In communities with high prevalence of infection, demographic factors rather than behavioral may reflect the risk of HSV-2 acquisition more accurately [5]. Large population-based studies are important to help us to better understand which factors are associated with the high prevalence of infection in specific populations to stem the epidemic. Interestingly, our experience from Ghana among asymptomatic women, showed that both behavioral and demographical factors such as educational attainment may be associated with risk of HSV-2 acquisition.

After the assessment of women on knowledge about HSV infection, the result of the study revealed that there was a poor level of knowledge of HSV infections and transmission of the virus, which must receive attention from healthcare managers [10]. Although recurrent herpes infection can be due to high temperature, UV light, stress, and immune status of the host [3], most of the respondents believe the “cold sores” are symptomatic of malaria.

Debrah et al. (2018) recommended that in consonance with the strategy of preventative rather than curative healthcare adopted by the Ghana Health Service, the public health concern should be directed toward development of educational programs on HSV transmission and initiation of intervention strategies in proven patient care settings. In furtherance of that point, such educational programs can be held for women of reproductive age by health workers during the morning talks at the Antenatal Clinics and Gynecology Departments at all health facilities.

The Ghana Health Service has already set up dedicated Cervicare Centers, at regional hospitals and selected health facilities for cervical screening. At these designated clinics, regular public education is given to women who are invited through mass media and periodic radio-based educational campaigns to attend cervical screening programs. Pertinent education on herpes infection, mode of transmission etc. can be added to these programs to address behavioral factors that pre-dispose women to infection risk especially for pregnant women.

Considering that HSV infection may increase susceptibility and infectiousness of other viruses, such as HPV [6] and HIV [7,2], and can be transmitted from mother to child during delivery [27], serological screening of women of reproductive age for herpes infection should be implemented as a part of routine visit to the Gynecology Department, Antenatal Clinic, and Cervicare Centers at various health facilities. This will help to identify and counsel women with asymptomatic genital herpes infection and to develop appropriate prevention strategies and reduce the health-related cost of complications [28,29].

Already, there is evidence of successful screening programs for pregnant women on some Sexually Transmitted Infections (STIs) [30]. In Ghana, screening for syphilis in all pregnant women at the first prenatal visit is mandatory. Type-specific serological screening for HSV-2 infection among pregnant women has been adopted in some countries [29,31] and may be considered for Ghana as more evidence continues to emerge.

There are different opinions on implementation of the serological screening for herpes virus among pregnant women. Some experts do not recommend type specific serological test if no confirmatory serology testing is available [32]. Others agree that serological screening for unrecognized HSV-2 infection in monogamous couples using ELISA test and western blot as confirmatory test, is expected to decrease the incidence of HSV-2 infection with attendant increase in healthcare cost. While using western blot assays instead of PCR as a confirmatory test for sero-positive herpes infection can decrease the cost marginally, [23] the western blot method is quite expensive, time consuming and requires special equipment and training to be readily feasible for low-income countries, such as Ghana. Different screening strategies have been proposed which include screening only all pregnant women or all couples [27,34].

However, the consensus seems to be that there is some efficiency in screening women during pregnancy owing to the potential to decrease newborn morbidity and mortality. Perhaps, considering the increased risk of acquisition of other viruses by sero-positive HSV women would also help to reveal the true value of sero-screening for herpes infection among pregnant women.

The next step after identifying sero-positive women for herpes infection should be professional counselling by agents of the health service providers [35]. Genital herpes is often associated with psychosocial distress, caused by having an STD, stigma of having such disease, and anxiety about resuming normal sexual life after acquisition [36,37]. The burden of disclosure to one's sexual partner can be a big problem for the herpes positive individual [35]. The distress is usually greater among women than men and in many persons, it surpasses the physical discomfort caused by the infection [36].

Finally, we recommended further studies on the genotypic prevalence of genital HSV infection to identify strains of the HSV-1 and HSV-2 virus presented in Ghanaian population. This will give background information for the vaccine development and implementation as well.

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