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# Sexually Transmitted Diseases Associated with Women Who Have Sex with Women

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## Author's contribution

The first author gathered scientific information and literature to compile the data for presentation and publication. The first author designed the overall structure of the presentation and analyzed the literature for relevant data. The first author prepared the text and proofed the material selected for presentation.

Mini-review Article

Received 5<sup>th</sup> January 2014  
Accepted 13<sup>th</sup> April 2014  
Published 21<sup>st</sup> April 2014

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## ABSTRACT

**Aims:** The aim of this work is to present the findings of various studies relevant to the incidence of sexually transmitted disease (STD) among women who have sex with women (WSW). This being an important issue when considering the numerous and diverse types of infections possible.

**Results:** The various types of STD, vaginal infections, and abnormalities that are known among WSW includes: *herpes simplex virus type 2*, *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, trichomoniasis, syphilis, hepatitis A, HIV, genital and oral human papillomavirus, pelvic inflammatory disease, allergic vaginitis, genital herpes and genital warts, squamous intraepithelial lesions, and bacterial vaginosis. Risk factors among WSW are the number of sexual partners, minimal use of protected sexual behaviors, and very low levels of knowledge of STD prevention among WSW. Drug-resistant pathogens have been observed in lesbian patients.

**Conclusion:** The threat of infection among WSW is significant, with the types and number of viral and bacterial potential pathogens being diverse and numerous. Recognition of risks will assist in correctly identifying the STD and aid in choosing the appropriate clinical care. Further research into the occurrence of STDs among WSW will benefit and contribute to public health.

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*Keywords: STD; genital herpes; HIV; bacterial vaginosis; WSW; HPV.*

## **ABBREVIATIONS**

*BV=bacterial vaginosis; HIV=human immunodeficiency virus; STD=sexually transmitted disease; WSW=women who have sex with women; HPV=human papillomavirus.*

## **1. INTRODUCTION**

The studies presented here provide revealing results pertaining to infections prevalent among women who have sex with women (WSW). It is found that the risk factors associated with these infections are found to play a significant part in the occurrence and spread of these infections. The findings of these studies discussed here will assist in elucidating the origin, spread, identification, and treatment of infections associated with women who have sex with women. In terms of demography, the spread of sexually transmitted disease (STD) among women who have sex with women deserves scrutiny because studies have shown that vagina-to-vagina transfer of infected cervico-vaginal secretions is a reasonable means of transmission [1].

The threat of sexually acquired infections among WSW is not inappreciable. The extent and type of infection are clinically significant and carries a substantial threat to the general health of the patient. In addition, the type as well as the numbers of potential pathological microbes are diverse and quite numerous. The number of potential incidents is substantial because studies have estimated that between 1.4% to 4.3% of all women fall into the category of WSW, with this being either on the basis of self-identification or by behavior [1].

There is conclusive evidence that human papillomavirus (HPV) is transmitted among WSW [1]. In addition, reports have been published indicating that transmission of HIV and hepatitis B do occur within the group of WSW [1].

Interestingly, many WSW have histories of sexual activity with males, a fact that makes counseling WSW more problematic due to varied history of sexual activity and potential exposure to related pathogens [2]. In a previous study, a majority of WSW reported sexual histories with men (a total of 82%). It was found that bacterial vaginosis and candida species were commonly diagnosed among those surveyed (31.4% and 18.4% respectively). Although genital warts, genital herpes, and trichomoniasis were infrequently diagnosed (1.6%, 1.1%, and 1.3% respectively), those infections are significant for the health of the patient [2].

Furthermore, the actual screening for STDs among WSW is problematic due to infrequent screening, ignorance of disease risk among WSW, and potential discomfort among WSW in discussing identity and behavior with health providers [3]. All of these issues contribute to the misconception that WSW are at low risk for STDs [3]. Studies have shown that WSW have a higher-risk behavior for hepatitis C, HIV, and bacterial vaginosis (BV), then the risk among women who do not engage in same-sex behavior [4]. The most common sexual practice among bisexual women and those women practicing rigorous same-sex activity are oral-genital sex, oral-anal contact, genital-genital contact, mutual masturbation, and vaginal penetration with fingers, hands, or sex toys (e.g. vibrators, dildos, food items) [5-7].

Various studies have reported the detection of HPV DNA in as many as 13% to 30% of practicing lesbians [7]. The source of the HPV infection is made more complicated than the

fact that as many as 21% to 30% of women identifying as lesbian continue to have sex with males [7]. Female to female sex activity involves physical activity that easily transmits STDs, because only mucosa contact or skin-to-skin contact is required for transmission of HPV, herpes simplex virus (HSV), and *Treponema palladium* (syphilis) [7]. Reports have presented data showing BV is prevalent among as many as 24% to 51% of all lesbians and Chlamydial infection in 3% to 5% [7]. Vigorous use of sex toys can create access to blood secretions. Blood exposed sex toys have been shown to be the vector in which bisexual females can infect a rigorous same-sex practicing partner with blood borne viral infection, including HIV [8].

General education concerning the plausibility of contracting STDs and the risk behavior involved with female same-sex activity that involves tissue or organ damage may remediate the spread of disease and induced injury [9]. In addition, it is potentially helpful to make clear that heavy drinking and use of drugs (other than alcohol) does appear prevalent and statistically significant among young lesbians and may increase unsafe sex practices [10]. National studies have indicated that heavy alcohol intake, higher rates of drinking alcohol, and alcoholism is higher among lesbians, than women in general, and may contribute to unsafe sex practices [11]. Furthermore, identified risk factors such as drug abuse, family history of alcoholism, rape, and childhood sexual abuse are reported higher for lesbians [11].

Among lesbian college students, it has been reported distinct and measureable lower self-esteem, increased interpersonal distrust, increased ineffectiveness, and greater difficulty in self-identification of emotions than for heterosexual students [12]. Body esteem appeared to be related more closely with self-esteem in lesbians, than in heterosexual students [12]. Furthermore, between lesbian and bisexual college students, there is greater depression, loneliness, and fewer reasons for living than the control group of students coming from the same institution [13]. Sexual orientation has been found to be an important risk marker for growth in of substance abuse in adolescent individuals. A significant disparity between lesbians and heterosexual teenagers increases as they transition into young adulthood. The disparity between heterosexual adolescents and the higher rate of substance abuse among lesbian adolescents is growing even wider, and this behavior has been shown to be a predictor for future substance abuse [14]. Teenagers involved in same-sex behavior or bisexual activities are substantially at higher risk for smoking and use of tobacco products than heterosexual adolescents [15]. Bisexual females and WSW are at a considerable higher risk for suicidal ideation, mental disorder, substance abuse, and deliberate self-harm compare to heterosexual individuals [16].

These subjects and others to be presented are important considerations for public health action and direction of study for developing appropriate clinical care. Lack of knowledge of risk involved with same-sex practices and subsequent inclination for substance abuse contributes significantly to proliferation of infection and long-term damage to health. The subject matter deserves careful attention and study.

## **2. METHODOLOGY**

This literature review comprises many studies and results of studies that are encompassed within the area of consideration. The collection, reading, and selection of the numerous studies considered for this mini-review article occurred within the time period of August 2013 to December 2013, inclusively. The libraries and databases ultimately examined included the numerous prestigious journals that exclusively cover the area of sexually transmitted diseases, diseases associated with or concomitant with sexual activity, and long-term/short-

term health consequences of sexually acquired diseases. The examples of search phrases or words utilized, included the following: STI, lesbian sexual activity, women who have sex with women, WSW, gay sexually transmitted diseases, sexually transmitted infections, lesbian sexual acquired infections, lesbian associated infections, and lesbian associated infections. Over the time period described previously, a collection of more than 200 articles were identified, of which 55 were selected for inclusion in this literature review. The articles were cross correlated to identify areas of overlap or similarity, which was accomplished very early in the selection process. Redundancy of subject topic was identified, but inclusion was decided if the articles presented a different, helpful, or illuminating view point on the subject matter. Selection criterion was rigidly controlled and included only those studies that were a direct treatise of sexually transmitted diseases involving women who have sex with women (category of lesbian) and studies of behavior contributing to-or associated with sexually acquired disease of female same-sex sexual action. As a consequence, a collection of 55 state-of-the-art studies was accumulated and presented for their scientific content of this important topic.

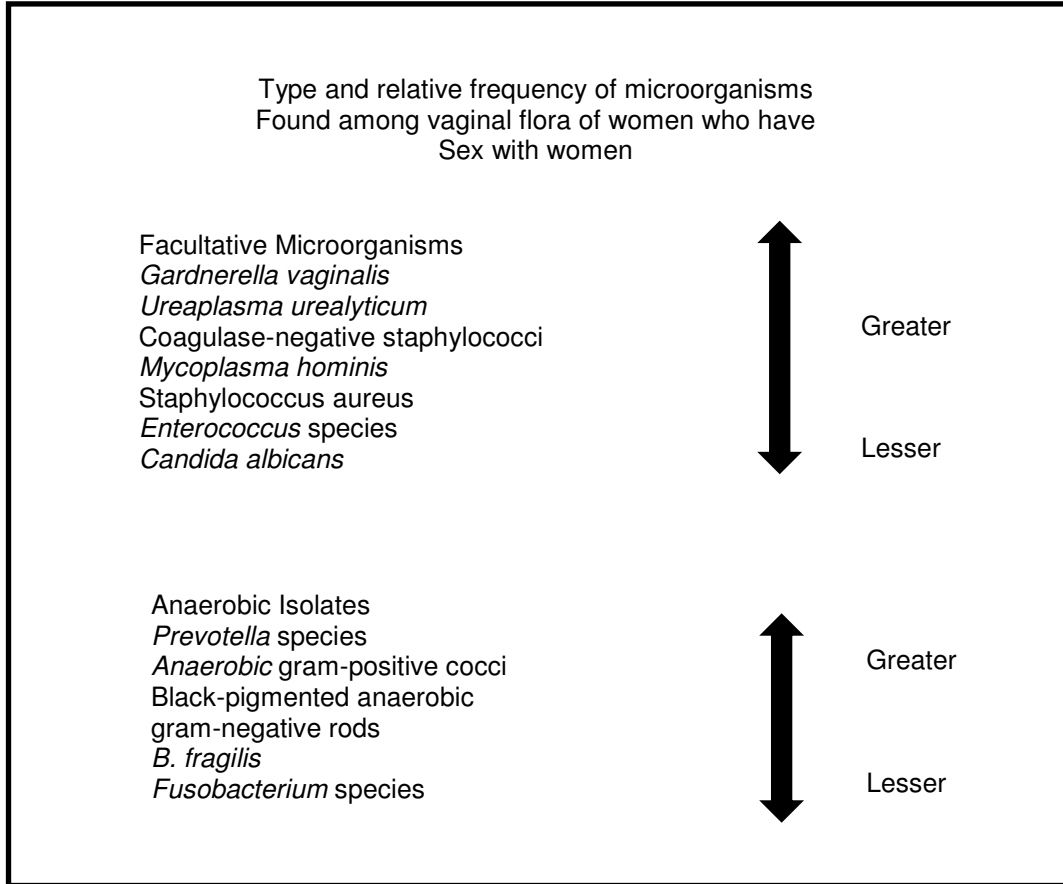
### 3. INFECTIONS AND SEXUAL HISTORY

Clinical information has been forth-coming concerning the potential and actualized health risks associated with female same-sex activity. The method of sexual contact plays an important role in the type and extent of an STD that is transmitted. It is known that skin contact alone can be sufficient for the transmission of crabs and herpes. A sub-population of lesbians will have unsafe sex with men in addition to same-sex contact [17]. Specifically, for women, having a history of sex with women can be an indicator for increased risk of adverse reproduction outcomes (ie. Difficulty in conception and bringing to birth), sexual, as well as general health outcomes compared with women who report sex solely with males [17]. A nonjudgmental review of female patients' sexual history should help practitioners discuss risks that women may face. This complicates the sexual activity history of the patient and reluctance to explain such activity can increase the difficulty of identifying potential pathological infections of the patient [17]. In a previous study from Harlem, New York, it is found that among injection drug users, the sub-population at the highest risk for HIV infection included Latinos, young women, and young men who had sex with homosexual men. In the case of WSW, the prevalence of HIV infection may be able to be partially explain as being due to their having unprotected sex with older men [18].

Overall, the populations of WSW are found to be quite diverse in levels and the types of sexual behavior, sexual identity, risk behaviors, and sexual practices [19]. This fact complicates detection and treatment of the various infections that can occur. The types of vaginal infections known to occur among WSW is extensive, and includes the following: herpes simplex virus type 2 [20], *Chlamydia trachomatis* [21], *Neisseria gonorrhoeae* [21], *Trichomoniasis* [22], syphilis [23], hepatitis A [24], HIV [25], genital and oral human papillomavirus [26], pelvic inflammatory disease [27], tuboovarian abscess [27], allergic vaginitis [19], genital herpes and genital warts [28], squamous intraepithelial lesions [19], and bacterial vaginosis [29].

In cases in which WSW have sexual histories with men along with women, or histories of injecting drug abuse, become vulnerable to sexually transmitted infections and blood borne infections [28]. Various types of HPV have been associated with oncogenic capability and can be associated with oral lesions [26]. The testing of vaginal flora among WSW has shown a multitude of potential adverse microbial presences [29]. The results of previous studies utilizing gram-stain method have shown this diverse population of microorganisms (see Fig.

1.) [29]. The presence of Facultative and Anaerobic species of microbes suggests an important and a significant health threat to the patient. These species are usually contained and not found to be of a substantial threats to normal and healthy vaginal tissue [29].



**Fig. 1. Microorganisms identified by gram stain and isolated from WSW population. The frequency of these microorganisms relative to the total types identified are indicated by the inset arrow and designated as “greater” or “lesser” frequency [29]**

Sexual transmission of bacteria and virus has been reported numerous times among WSW. Alarmingly, it has been observed that herpes simplex virus type 2 (HSV-2) infections occur in approximately 1 in 10 lesbians, and this finding is not predicted or controlled by any report of sex with men or sexual identity [30]. These same investigators determined that most lesbians infected with HSV-2 are actually not aware of this infection [30]. Statistically, the sexual transmission of HSV-1 may be occurring more frequently among lesbians than among heterosexual women in comparison [30].

Survey and reports accumulated in London, for lesbians and bisexual women, indicate that the majority of WSW (82%) reports some level of sexual history with men [28]. In that study, the occurrence of some STD such as chlamydia, pelvic inflammatory disease, and gonorrhea were occurring only in women who had history of sexual activity with males [28].

Other infections that occur will include candida species, genital warts, *Trichomoniasis*, etc. (see Table 1) [28].

**Table 1. Frequency of STD Occurrence [28]: Among 708 WSW in London**

Infection	Frequency among 708 WSW
<i>Bacterial vaginosis</i>	31.4%
<sup>a</sup> <i>Candida</i> species	18.4%
Genital warts	1.6%
Genital herpes	1.1%
<sup>b</sup> <i>Trichomoniasis</i>	1.3%
<sup>c</sup> <i>Chlamydia</i>	0.6%
*Pelvic Inflammatory disease	0.3%
* <i>Gonorrhoea</i> Infections	0.3%

<sup>a</sup>Diagnosed only in women subjects with histories of sex with men. <sup>a</sup>*Candida* is a genus of yeasts.

<sup>b</sup>*Trichomonas* is an anaerobic and flagellated protozoan. <sup>c</sup>*Chlamydia* is a genus of parasitic obligate bacteria.

Earlier studies have found that vulvovaginal candidiasis (VVC) is associated with sexual activity between women and is considered common by some investigators (found among 18.4 % of 708 WSW in London, United Kingdom) [31]. This same study found that VVC was not statistically associated with specific sexual practices, use of lubricants/douching, or number of male partners but wholly upon the number of female sexual partners [31].

An erroneous assumption of health care providers is that WSW do not need routine Pap smears. However, many WSW have a history of sexual activity with males thus necessitating Pap smear screening for pre-cancerous and cancerous processes [28, 32].

Moreover, cases of rigorously lesbian (i.e. with no male sexual history) individuals who have had many female sexual partners, who themselves have history of male sexual activity, apparently will contract human papillomavirus HPV type resulting in the cervical intraepithelial neoplasia grade 2 [32]. It appears that the greater the number of sexual partners, the greater the risk at least for some infections. This is yet another facet of education that would enable better response to the spread of these infections.

#### 4. BACTERIAL VAGINOSIS INCIDENCE AND STATISTICS

Bacterial vaginosis (BV) is determined to be common among women who have sex with women and frequently do occur even in both members of monogamous couples [29]. The appearance of bacterial vaginosis is considered to most consistently be linked to the sexual behavior/practice of the patient [33]. Interestingly, a male-to-female vector is considered inconclusive by some investigators; however, bacterial vaginosis is certainly a condition associated with specific behavior/practices [33]. The condition of BV is clearly associated with the appearance of a sexually transmitted infection in general; and can spread in a patient as an ascending genital tract infection. The occurrence of a BV ascending infection can have substantial effect on the health of the female patient and has been associated with pelvic inflammatory disease, postpartum endometritis, post-abortion endometritis, and spontaneous preterm birth during pregnancy [33]. Alarmingly, it has been shown that bacterial vaginosis can propagate viral replication and vaginal shedding of the HIV-1 and HSV-2 viruses, and in this manner significantly enhances the spread of these viruses [33].

The occurrence of bacterial vaginosis has been reported to increase the risk of the acquisition of HIV, pelvic inflammatory disease, low birth weight, and heightened probability of preterm delivery [29]. The normal and healthy vaginal area supports a hydrogen peroxide producing lactobacilli, whereas, the condition of BV is characterized by overwhelming growth of commensal anaerobic flora [29]. Bacterial vaginosis is characterized by even a partial loss of the indigenous vaginal lactobacilli accompanied by a polymicrobial anaerobic overgrowth of the vaginal mucosa [33]. The occurrence of bacterial vaginosis is reported to be high among WSW [29]. Bacterial vaginosis is shown to be associated with a higher lifetime number of female sex partners, as well as failure to always clean an insertive sex toy before use, and oral-anal sex with female partners [29].

General lesbian predilection or general WSW is found consistently to have very high rates of bacterial vaginosis [33]. Interestingly, lesbian heterosexual sexual activity is not found to account for the high rate of BV appearance among WSW [33]. Some investigators have found a significant association of BV risk to lack of aseptic habits in the action of oral-anal sex, use of inserted toys, and recent genital-to-genital contact with a female [33]. Other studies have shown a 2.5-fold increase in the appearance of bacterial vaginosis among WSW when compared to rigorously heterosexual women [34]. The rate of BV found among lesbian patients was 25.7% of study subjects whereas the rate was 14.4% of heterosexual females [34]. In that study, it was observed that smoking was independently associated with BV and disposition of vaginal flora among lesbian partnerships supports the contention that BV is sexually transmitted [34]. In addition, other studies have shown that BV is common with WSW and an increase in the number of female partners, for an individual lesbian, is associated with increased likelihood of contracting BV [35].

Other studies have found that between 101 lesbians surveyed, a total of 28.7% of those surveyed had bacterial vaginosis [36]. Even among monogamous practicing lesbians who had BV, as much as 72.7% of partners also had active BV infection [36]. Whereas among those not having BV, only 10% of partners showed an active BV infection [36]. In addition, those lesbians in monogamous relationships were shown to have strong similarity in vaginal secretions [36]. Previous work has shown that alterations in the vaginal microbial state appear to precede the development of BV [37]. The occurrence of BV is common among WSW and occurrence of BV is directly associated with appearance of new partners [37]. At this time, there is only little evidence in support of some type of male-to-female sexual transmission of BV-associated pathogens and BV is seen associated with sexually enhanced behaviors (ie. greater and longer frequency) [33]. In summation, there does appear to be a high prevalence of bacterial vaginosis of between 29 to 52% reported in lesbians by studies from the UK and USA, with these studies suggesting that the prevalence is significantly higher than in heterosexual women [34].

## **5. TRANSMISSION ROUTES AND REDUCTION OF RISK TO INFECTION**

Risk reduction for acquired STD deserves considerable attention for attenuation of the appearance of diseases. Various behaviors preceding and during sexual activity are thought to influence the incitement of high-risk sexual activity. Even when controlling for demographic attributes, inclusive of sexual identity, higher sexual risk activity occurs with higher levels of hazardous drinking (i.e. Binge drinking) and the use of alcohol for sexual intimacy enhancement [38]. Efforts for the reduction of high-risk sexual activity among WSW should include discussion and warning of the influences of alcohol use and the alcohol consumption-related expectancies with sexual behavior [38].

Oral sex is known to be a common sexual practice among homosexual couples with oro-genital sex being associated as a transmission route of syphilis, gonorrhea, *Chlamydia trachomatis*, *Neisseria meningitides*, chancroid, *streptococci*, *Haemophilus influenza*, and *Mycoplasma pneumonia* [39]. Various respiratory organisms such as streptococci, *Haemophilus influenzae*, and *Mycoplasma pneumoniae* may also be transmitted by an oral sex route. The action of cunnilingus is considered to predispose participants to recurrent vaginal candidiasis. What is clear is that oro-anal sex is implicated with various enteric infections. Therefore, oral sex is a significant route for transmission of respiratory, oral, and genital pathogens [39].

The use of a vibrator has been found to be common among WSW and found to be more prevalent in those that are bisexual, by some investigators [40]. In that study, women in the United States and England that have sex only with women, and in a one-year period, reported more than 75% use of a vibrator during solo masturbation or with a female partner [40]. The sharing of vibrator, needles, unprotected cunnilingus, unprotected fellatio, unprotected vaginal/anal intercourse, and exchange of various sex toys are considered to be high-risk behaviors for transmission of STDs among WSW. The use of latex gloves, dental dams, and condoms are generally considered useful for reduction of risk [41]. The transmission of HIV has been noted in cases of women having sex exclusively with women, and in specific instance involved the sharing of sex toys and oral sex (with bleeding during the sex process) [41]. In a specific case, the exchange of blood tinged sex toys was considered the vector for transmission of HIV between a lesbian and a bisexual female [41].

Another study focused on lesbian and bisexual women living outside major AIDS epicenters, and describes risk factors for HIV transmission among lesbian and bisexual women living in small cities in four geographic regions of the United States. In that study, close to 17% of bisexual respondents and 0.5% of lesbians reported having had unprotected vaginal or anal sex with a male partner during the two months prior to the survey [42]. Furthermore, almost 10 percent of bisexual women and 8.8% of lesbians in the survey reported a history of injection drug use. Alarming, among those women surveyed who were tested by accepted methods showed 1.4% infected with HIV [42]. A high rate of injection drug use and sharing of needles is a substantiated vector for transmission of HIV among WSW [43].

Other risk factors among WSW are clearly the number of sexual partners (current and historical), minimal use of protected sexual behaviors (of all types), and glaringly low levels of knowledge of STD prevention among WSW [44]. In addition, a history of sexual abuse and poorer mental health has been found to contribute significantly to risky sex behaviors among WSW [44]. A previous study suggested that safe-sex information focusing on WSW is difficult to obtain, that challenge and the misconception that most WSW are at a low risk for STDs contributes significantly to risky sexual activity [45]. Even problems associated with allergic reaction to latex containing gloves are contributory to the practice of higher-risk sexual encounters [45]. Therefore, a specific risk reduction step is the exploration and promotion of non-latex products for safe-sex practice.

Preceding studies have indicated that other factors can complicate and/or inhibit the proper use of safe-sex measures among WSW. The factors that require attention, and remediation include: 1) The presumption that women who have sex with women cannot get HIV; 2) Substantial lack of familiarity with HIV prevention strategies; 3) The inconsistent practice of safer sex methods with other women (or men); and 4) The deleterious effects of alcohol and/or drug use on the conception and use of safe-sex efforts [46]. In an effort to develop safer sex recommendations for WSW, a previous study discovered that a wide diversity of



sexual behaviors, the majority of women reporting a history of genital rubbing (99.8%), vaginal fingering (99.2%), genital scissoring (90.8%), cunnilingus (98.8%) and vibrator use (74.1%) [47]. Barrier use was reported by a minority (<25%) of the participants of that study. The use of barriers as a safe-sex moderm is applied only in a minority of lesbian subjects [47].

## 6. SCREENING FOR INFECTION AND DRUG-RESISTANT MICROBES

To have a lesbian identity or being exclusively WSW will influence many health areas such as risk of HIV infection, need for emotional counseling, cancer risk, STD risk, depression, violence, and alcohol usage [48]. It is important that primary care physicians be aware of their patients' sexual orientation [48]. Health care institutions and the lesbian communities should greatly increase knowledge of-and information available for the fact that regular cervical screening is very important to this group [49].

Lesbians are much less likely to undergo regular screening in part because of misconception of vulnerability to the disease [50]. Various studies have shown that HPV can be transmitted sexually between women (it is not conclusive whether prevalence of HPV or even cervical cancer differs between lesbians and heterosexual women) [51]. Health care providers should also be aware of the patient's sexual history regardless of their confessed sexual orientation to effectuate screening for sexually transmitted diseases [51]. The evidence does consistently show that non-attendance for a cervical screening is much higher in lesbian populations than for heterosexual women (this outcome is believed to be linked to a belief that lesbians are less susceptible to cervical cancer and have less need for screening) [52]. This finding is alarming considering that 13% to 21% of lesbian women are predicted to contract a human papilloma virus [53]. Educational steps to raise lesbian familiarity of Pap smear testing and physician awareness of offering the test to lesbians is a necessary objective.

For more than three decades, metronidazole has been the most-favored antimicrobial drug for the treatment of *Trichomonal vaginitis* and because the infection is multifocal (involving Skene glands, urethra, and vagina) a systemic therapy is usually compulsory [54]. However, a study has documented a lesbian couple in which each presented similar symptoms and each failed to respond to the treatment with metronidazole that was found successful thus far [54]. Following up with the appropriate microbiological sensitivity testing showed conclusively that the lesbian couple carried a metronidazole-resistant form of *Trichomonas vaginalis* [54]. This necessitated a modified approach to treatment of this incidence which itself was not trivial in development or application. These incidents are of significant importance due to the lack of general knowledge of clinicians to this issue and the significant threat to the health of the patient as a consequence [54]. Antimicrobial drug resistance among human pathogenic microbes is an ongoing and world-wide concern [55]. Of rising concern is the world-wide appearance of human pathogens, which are often isolated from infections in patients from both community and hospital origins and are growing more resistant to commonly used antibiotics [55]. The failure of common antibiotics to stem infections would place a horrendous burden on less-developed nations having fewer resources to cope with the threat. It is believed by some investigators that the considerable number of multiple-drug-resistant bacterial pathogens is attributed to the overuse of broad-spectrum antimicrobial medications [55]. In addition, the way in which pathogenic bacteria continue to evolve complex gene-based responses to acquire antibiotic-resistant mechanisms [55]. Currently, pharmaceutical companies have down-sized their activity in the anti-infective domain of medicines and thereby present additional challenges in the ongoing

battle against drug-resistant microbes. Public education of the immediate threats of drug-resistant diseases will aid and remunerate deficiencies in clinical limitations of therapeutics.

## **7. CONCLUSION**

Previous studies have shown that vagina-to-vagina transfer of infected cervico vaginal secretions takes place during sexual activity of WSW. The actual screening for STDs among WSW is problematic due to infrequent screening, ignorance of risk for STDs among WSW, and potential discomfort among WSW in discussing identity and behavior with health providers. All these issues contribute to the misconception that WSW are at a low risk for STDs. Other studies have reported the detection of HPV DNA in as many as 13% to 30% of practicing lesbians. Risk factors include the number of sexual partners, the minimal use of protected sexual behaviors, and a glaringly low level of knowledge of STD prevention among WSW. In addition, a history of heavy drinking and use of drugs (other than alcohol) does appear to be prevalent among young lesbians and may exacerbate unsafe sex practices.

The type of STD and/or vaginal infection among WSW is considerable and includes: *herpes simplex virus type 2*, *Chlamydia trachomatis*, *Neisseria gonorrhoeae*, *Trichomoniasis*, syphilis, hepatitis A, HIV, genital and oral human papillomavirus, pelvic inflammatory disease, allergic vaginitis, genital herpes and genital warts, squamous intraepithelial lesions, and bacterial vaginosis. The occurrence of a bacterial vaginosis ascending infection can have substantial effect on the health of the female patient and has been associated with pelvic inflammatory disease, postpartum endometritis, post-abortion endometritis, and spontaneous preterm birth during pregnancy. The transmission of HIV has been noted in cases of women having sex exclusively with other women. Alarmingly, drug-resistant pathogens have been observed in exclusively same-sex lesbian patients. The appearance of drug resistant microbes pose a substantial threat to the effective clinical treatment of some sexually transmitted diseases.

Clearly, additional research is needed concerning the health issues facing WSW. Histories of sexual activity play a significant role in determining treatment methods and containment of spread. Education and dissemination of facts and treatment of these pathological conditions will aid the restriction of the spread of these disease conditions as well as improve medical response to afflicted patients. Further studies of the mode and extent of sexual related infections among WSW is highly recommended and important for general community health services.

## **CONSENT**

Not applicable.

## **ETHICAL APPROVAL**

Not applicable.

## **ACKNOWLEDGEMENT**

This project was supported by the College of Arts & Sciences, University of Nebraska and the Chemistry Department, Durham Science Center, Omaha Nebraska 68182 USA.

## COMPETING INTERESTS

Author has declared that no competing interests exist.

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