

# Profile of Sexually Transmitted Infections Detected by Serological Test on Men Who Have Sex with Men

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DOI: 10.29322/IJSRP.9.10.2019.p9475

<http://dx.doi.org/10.29322/IJSRP.9.10.2019.p9475>

**Abstract- Introduction :** Sexually transmitted Infection (STI) refers to a variety of clinical syndromes and infections caused by pathogens that can be acquired and transmitted through sexual activity.<sup>1</sup> Men who have sex with men (MSM) are at high risk of STI. Per definition MSM is a term to describe a variety of men who have sex with other men but do not necessarily share the same sexual orientation, sexual identity or gender identity otherwise focused on their sexual activity.<sup>1,2</sup>

**Objective :** To determine the description of STI detected by serological test on MSM.

**Methods :** A descriptive study with case series design involving 50 men who have sex with other men who visiting dermatology and venereology department of H.Adam Malik General Hospital, Voluntary Counselling and Testing (VCT) center of H.Adam Malik General Hospital, Teladan Primary Health Care and Padang Bulan Primary Health Care. Each participant had serological test for VDRL/TPHA, IgM-IgG HSV-2 and rapid test HIV.

**Results :** Total 50 subjects with the highest distribution was in the age group 17-25 years (46%), senior high school (70%) and unmarried (90%). Syphilis was found in 10 subjects (20%), genital herpes in 6 subject (12%) and HIV in 33 subjects (66%). Syphilis and HIV coinfection was revealed in 8 subjects (16%), syphilis and genital herpes coinfection was found in 2 subjects (4%), genital herpes and HIV coinfection was found in 5 subjects (10%). There was 2 subjects (4%) with co infection of syphilis, genital herpes and HIV.

**Conclusion :** The proportion of STI among MSM relatively high. Unprotected anal intercourse is a high-risk practice for STI transmission.

**Index Terms-** Sexually transmitted infection, MSM, serological test

## I. INTRODUCTION

Sexually transmitted infections (STI) are a number of clinical syndromes or infections caused by certain pathogens that are transmitted through sexual activity.<sup>1,2</sup> Identification of causative pathogens through laboratory tests is very important in the diagnosis and management of patient with STI. Some STI are asymptomatic and can be detected by serological tests including HIV, syphilis and genital herpes. The purpose of such test is to detect serum antibodies that appear specifically in association with certain diseases.<sup>3</sup>

Syphilis is caused by infection with the spirochete bacterium *Treponema pallidum* subspecies *pallidum*. It is a multistage, multi system disease which is transmitted by direct contact with an infectious lesion or by vertical transmission during pregnancy.<sup>4,5</sup> Genital herpes is a genital ulcer disease caused by herpes simplex virus (HSV) with typical symptoms grouped of vesicles on an erythema basis and tend to recurrent.<sup>6</sup> Human Immunodeficiency Virus is a human lymphotropic retrovirus, which is mostly transmitted through sexual contact. Immunosuppression from HIV infection is the result of progressive depletion of CD4+ T lymphocytes.<sup>7</sup>

Sexually transmitted infections with clinical manifestations of ulcers such as syphilis and genital herpes will increase HIV transmission. The ulcer that occurs will be a porte d'entrée of virus. In addition, the inflammatory response that forms around the ulcer will increase the number of activated T lymphocytes around the entry site.<sup>7</sup>

Men who have sex with men (MSM) are defined as men who have sex with other men regardless of sexual orientation or gender identity, and whether they also have sexual relations with women.<sup>1,2,8</sup>

Based on study of Integrated Biological and Behavioral Surveillance in Indonesia in 2011 the increase of HIV prevalence in MSM group was from 5% in 2007 to 12% in 2011 while the prevalence of syphilis was 9% in 2011.<sup>8,9</sup> Study of Mohammed et al in 2014 at United Kingdom showed that prevalence of genital herpes in MSM was 10.1%.<sup>10</sup>

Being able to understand STI in MSM requires a multi-disciplinary approach in terms of medical, microbiological and social aspects. Although the gay movement has existed for a long time ago, MSM patients are still reluctant to declare themselves as MSM to health workers. It is because of the negative stigma in society. Various STIs that affect mouth and anus tend to be asymptomatic and permanent. Without proper laboratory tests, some STIs will go undetected. The present study was aimed to determine of profile of STI detected by serological test on MSM.

## II. METHODS

This study was conducted from Desember 2018 until June 2019. It was an observational study with case series design which involved 50 men who have sex with men who visited Departement of Dermatovenereology H.Adam Malik General Hospital Medan, Voluntary Counselling and Testing (VCT) center of H.Adam Malik General Hospital Medan, Teladan Primary Health Care

Medan and Padang Bulan Primary Health Care Medan. Each subjects signed informed consent, interviewed and had blood test. Blood specimen was taken from each subject. All specimens were screened for syphilis using VDRL-TPHA test, herpes genitalis using IgM/IgG HSV-2 and rapid test for HIV. This study has been approved by the Health Research Ethics Commission of the Faculty of Medicine, Universitas Sumatera Utara/H.Adam Malik General Hospital Medan.

### III. RESULTS

Total 50 subjects, with the highest distribution was in the age group 17-25 years (46%). The most common level education of the patient was high school (70%). Regarding of marital status, most of subject of this study was single (90%).(Table 1)

**Table 1. Characteristics subjects**

| Description        |                | n  | (%)  |
|--------------------|----------------|----|------|
| Age (years)        | 17-25          | 23 | 46,0 |
|                    | 26-35          | 21 | 42,0 |
|                    | 36-45          | 5  | 10,0 |
|                    | 46-55          | 1  | 2,0  |
| Level of education | Primary school | 0  | 0,0  |
|                    | Middle school  | 2  | 4,0  |
|                    | High school    | 35 | 70,0 |
|                    | University     | 13 | 26,0 |
| Marital Status     | Single         | 45 | 90,0 |
|                    | Married        | 4  | 8,0  |
|                    | Divorced       | 1  | 2,0  |

In this study there were 10 people (20%) of subjects who had syphilis infection. Distributed by age group, consisting of 3 person from 17-25 years, 6 from 26-35 years and 1 from 46-55 years. Based on level of education, 8 subjects with syphilis infection had high school level and 2 subjects had university level. Majority of subject with syphilis was single (Table 2)

**Table 2. Characteristics subject with syphilis**

| Description        |                | Syphilis |      | Non Syphilis |      |
|--------------------|----------------|----------|------|--------------|------|
|                    |                | n        | (%)  | n            | (%)  |
| Age (years)        | 17-25          | 3        | 13   | 20           | 87,0 |
|                    | 26-35          | 6        | 28,6 | 15           | 71,4 |
|                    | 36-45          | 0        | 0    | 5            | 100  |
|                    | 46-55          | 1        | 100  | 0            | 0,0  |
| Level of education | Primary school | 0        | 0    | 0            | 0,0  |
|                    | Middle school  | 0        | 0    | 2            | 100  |
|                    | High school    | 8        | 22,9 | 27           | 77,1 |
|                    | University     | 2        | 15,4 | 11           | 84,6 |
| Marital status     | Single         | 9        | 20   | 36           | 80,0 |
|                    | Married        | 0        | 0    | 4            | 100  |
|                    | Divorced       | 1        | 100  | 0            | 0,0  |

The results of the study was 6 subjects (12.0%) were diagnosed with genital herpes with demographic characteristics

were 1 person in 17-25 age group and 5 person in 26-35 age group. 4 subjects had high school education and 2 subjects had universities education. Whereas based on marital status divided into 4 subjects who are single, 1 subject was married and 1 other person is divorced. (Table 3)

**Table 3. Characteristics subject with genital herpes**

| Description        |                | Genital herpes |      | Non Genital herpes |      |
|--------------------|----------------|----------------|------|--------------------|------|
|                    |                | n              | (%)  | n                  | (%)  |
| Age (years)        | 17-25          | 1              | 4,3  | 22                 | 95,7 |
|                    | 26-35          | 5              | 23,8 | 16                 | 76,2 |
|                    | 36-45          | 0              | 0    | 5                  | 100  |
|                    | 46-55          | 0              | 0    | 1                  | 100  |
| Level of education | Primary school | 0              | 0    | 0                  | 0,0  |
|                    | Middle school  | 0              | 0    | 2                  | 100  |
|                    | High school    | 4              | 11,4 | 31                 | 88,6 |
|                    | University     | 2              | 15,4 | 11                 | 84,6 |
| Marital status     | Single         | 4              | 8,9  | 41                 | 91,1 |
|                    | Married        | 1              | 25   | 3                  | 75   |
|                    | Divorced       | 1              | 100  | 0                  | 0    |

In this study, it was found that there were 33 subjects with HIV infection (66%). Based on demographic characteristics, 33 subjects consisted of 14 subjects in the age group of 17-25 years, 15 subjects in the age group of 26-35 years and 4 subjects in the age group of 36-45 years. Whereas based on the level of education the distribution were 1 subjects had level of education middle school, 24 subjects in high school and 8 subjects in university. Based on marital status was 29 subjects single, 3 married and 1 divorced.(Table 4)

**Table 4. Characteristic subject with HIV infection**

| Description        |                | HIV |      | Non HIV |      |
|--------------------|----------------|-----|------|---------|------|
|                    |                | n   | (%)  | n       | (%)  |
| Age (years)        | 17-25          | 14  | 60,9 | 9       | 39,1 |
|                    | 26-35          | 15  | 71,4 | 6       | 28,6 |
|                    | 36-45          | 4   | 80   | 1       | 20   |
|                    | 46-55          | 0   | 0    | 1       | 100  |
| Level of education | Primary school | 0   | 0    | 0       | 0    |
|                    | Middle school  | 1   | 50   | 1       | 50   |
|                    | High school    | 24  | 68,6 | 11      | 31,4 |
|                    | University     | 8   | 61,5 | 5       | 38,5 |
| Marital status     | Single         | 29  | 64,4 | 16      | 35,6 |
|                    | Married        | 3   | 75   | 1       | 25   |
|                    | Divorced       | 1   | 100  | 0       | 0    |

The results of this study was 8 subjects (16.0%) had syphilis and HIV co-infection with demographic characteristics, were 3 subjects in age group of 17-25 years while 5 other in the age group of 26-35 years. While based on the level of education the distribution were 6 subjects had high school education and 2 had university education. Total of 7 MSM with syphilis and HIV co-infection in this study were single while 1 subjects was divorced. (Table 5)

**Table 5. Characteristic subject with syphilis and HIV co-infection**

| Description        |                | syphilis-HIV Coinfection |      | Non syphilis-HIV coinfection |      |
|--------------------|----------------|--------------------------|------|------------------------------|------|
|                    |                | n                        | (%)  | n                            | (%)  |
| Age (years)        | 17-25          | 3                        | 13   | 20                           | 87   |
|                    | 26-35          | 5                        | 23,8 | 16                           | 76,2 |
|                    | 36-45          | 0                        | 0    | 5                            | 100  |
|                    | 46-55          | 0                        | 0    | 1                            | 100  |
| Level of education | Primary school | 0                        | 0    | 0                            | 0    |
|                    | Middle school  | 0                        | 0    | 2                            | 100  |
|                    | High school    | 6                        | 17,1 | 29                           | 82,9 |
|                    | University     | 2                        | 15,4 | 11                           | 84,6 |
| Marital status     | Single         | 7                        | 15,6 | 38                           | 84,4 |
|                    | Married        | 0                        | 0    | 4                            | 100  |
|                    | Divorced       | 1                        | 100  | 0                            | 0    |

The results of present study were 2 subjects (4.0%) had syphilis and genital herpes co-infection with demographic characteristics are in 26-35 years. Otherwise based on level of education the distribution was 1 subject had high school education and 1 subject had university education. From marital status, 1 subjects was single while the remaining 1 subject was divorced.(Table 6)

**Table 6. Characteristic subject with syphilis and genital herpes coinfection**

| Description        |                | syphilis genital herpes coinfection |     | syphilis-genital herpes coinfection |      |
|--------------------|----------------|-------------------------------------|-----|-------------------------------------|------|
|                    |                | n                                   | (%) | n                                   | (%)  |
| Age (years)        | 17-25          | 0                                   | 0   | 23                                  | 100  |
|                    | 26-35          | 2                                   | 9,5 | 19                                  | 90,5 |
|                    | 36-45          | 0                                   | 0   | 5                                   | 100  |
|                    | 46-55          | 0                                   | 0   | 1                                   | 100  |
| Level of education | Primary school | 0                                   | 0   | 0                                   | 0    |
|                    | Middle school  | 0                                   | 0   | 2                                   | 100  |
|                    | High school    | 1                                   | 2,9 | 34                                  | 97,1 |
|                    | University     | 1                                   | 7,7 | 12                                  | 92,3 |
| Marital status     | Single         | 1                                   | 2,2 | 44                                  | 97,8 |
|                    | Married        | 0                                   | 0   | 4                                   | 100  |
|                    | Divorced       | 1                                   | 100 | 0                                   | 0    |

The results of present study showed that 5 subjects (10%) had genital herpes and HIV co-infection. 4 subjects were 26-35 years and 1 subject in 17-25 years. Otherwise according to the level of education 3 subject had high school education and 2 subjects with university education. Based on marital status, the

distribution was 3 subjects are single, 1 person is married and 1 subject is divorced.(Table 7)

**Table 7. Characteristics subject with genital herpes and HIV co-infection**

| Description        |                | Genital herpes-HIV coinfection |      | Non genital herpes-HIV coinfection |      |
|--------------------|----------------|--------------------------------|------|------------------------------------|------|
|                    |                | n                              | (%)  | n                                  | (%)  |
| Age (years)        | 17-25          | 1                              | 4,3  | 22                                 | 95,7 |
|                    | 26-35          | 4                              | 19   | 17                                 | 81   |
|                    | 36-45          | 0                              | 0    | 5                                  | 100  |
|                    | 46-55          | 0                              | 0    | 1                                  | 100  |
| Level of education | Primary school | 0                              | 0    | 0                                  | 0    |
|                    | Middle school  | 0                              | 0    | 2                                  | 100  |
|                    | High school    | 3                              | 8,6  | 33                                 | 91,4 |
|                    | University     | 2                              | 15,4 | 12                                 | 94,6 |
| Marital status     | Single         | 3                              | 6,7  | 42                                 | 93,3 |
|                    | Married        | 1                              | 25   | 3                                  | 75   |
|                    | Divorced       | 1                              | 100  | 0                                  | 0    |

The results of this study were 2 people (4%) had syphilis, genital herpes and HIV co-infection. The demographic characteristics were 2 subjects from 26-35 age group. 1 subject had high school education and 1 subject had university education. From marital status 1 subject is single while the other 1 is divorced

**Table 8. Characteristics subject with syphilis, genital herpes and HIV co-infection**

| Description        |                | syphilis genital herpes coinfection |     | syphilis-genital herpes coinfection |      |
|--------------------|----------------|-------------------------------------|-----|-------------------------------------|------|
|                    |                | n                                   | (%) | n                                   | (%)  |
| Age (years)        | 17-25          | 0                                   | 0   | 23                                  | 100  |
|                    | 26-35          | 2                                   | 9,5 | 19                                  | 90,5 |
|                    | 36-45          | 0                                   | 0   | 5                                   | 100  |
|                    | 46-55          | 0                                   | 0   | 1                                   | 100  |
| Level of education | Primary school | 0                                   | 0   | 0                                   | 0    |
|                    | Middle school  | 0                                   | 0   | 2                                   | 100  |
|                    | High school    | 1                                   | 2,9 | 34                                  | 97,1 |
|                    | University     | 1                                   | 7,7 | 12                                  | 92,3 |
| Marital status     | Single         | 1                                   | 2,2 | 44                                  | 97,8 |
|                    | Married        | 0                                   | 0   | 4                                   | 100  |
|                    | Divorced       | 1                                   | 100 | 0                                   | 0    |

#### IV. DISCUSSION

Out of 50 MSM in this study, the highest distribution in the age group of 17-25 years (46%) and the lowest in the age group of 46-55 years (2%). A similar study by Liu *et al* in Beijing showed that out of 1003 MSM whom evaluated from September 2009 to April 2012 the largest distribution is the age group of 17-24 years.<sup>11</sup> Study conducted by Wati in Teladan Primary Health Care Medan showed that reproductive age is the largest age group in MSM.<sup>12</sup> Reproductive age is an indication of biological conditions and activity of sexual hormones, at this time if the sexual desire is not accompanied by self and social control, it will be susceptible to causing sexual deviations.<sup>12,13</sup> Otherwise the easiness to access pornography and lack of sexual education had an impact as well.<sup>14</sup>

In present study, the highest distribution of level of education was high school. Hypothetically there is a relationship between education and personal behavior, in accordance with the function of school as an education center. A number of studies have shown that MSM have relatively high levels of education. This characteristic data showed that formal education cannot reflect the behavior of an individual. For this reason, an in-depth analysis of their family background, their views on religion values and norms are needed.<sup>13</sup>

The largest distribution of MSM marital status in present study was single (90%). It was also supported by study by Liu *et al* in Beijing who reported that 71.3% of MSM were single.<sup>11</sup>

Marital status played a role in the regulation of someone's life and will also have an impact on the risk of sexual deviation. The presence of a wife and child can increase the responsibility to protect their families from the bad effects of their sexual behavior. So most of MSM would delay to get married.

The proportion of syphilis infection in this study was 20%. Anal intercourse among MSM is a major factor in syphilis transmission. Multiple sexual partners is also a major risk factor for transmission of syphilis among MSM. However this population is vulnerable to being connected to sexual networks through online dating.<sup>16</sup> Lack of knowledge about STI transmission also plays a role in the high incidence of syphilis among MSM.<sup>17</sup>

In our study the proportion of genital herpes was 12%. Genital herpes is a common STI. The infection is often asymptomatic. Unprotected anal intercourse is a major risk factor for transmission of genital herpes among MSM.<sup>18</sup>

The proportion of HIV infection in present study was 66%. According to the literature, anal sex is the most risky sexual behavior in MSM. Failure to use condoms is also higher in anal sex compared to vaginal sex. HIV infection is higher in MSM with receptive sexual role compared to MSM with insertive sexual role.<sup>19-21</sup>

The proportion of syphilis and HIV co-infection in this study was 16%. Syphilis in one of genital ulcer disease and closely related to HIV transmission. Syphilis and HIV coinfection is associated with a slight temporary decrease in CD4 cell count and an increase in viral load. *T. pallidum* infection shows adverse effects on the immunological and virological status of people infected with HIV.<sup>22,23</sup> HIV infection can also improve clinical lesions and accelerate the development of syphilis infections.<sup>24</sup>

The proportion of genital herpes and HIV coinfection in present study was 10%. Genital herpes and HIV are closely related. Both infections had synergy to increase the recurrence rate

of genital herpes infection while also increasing HIV transmission even in asymptomatic individuals. Replication of both viruses will increase if there is a decrease in CD4 cell count accompanied by more severe clinical manifestations. The HSV-2 virus also facilitates replication of HIV.<sup>25</sup>

The proportion of syphilis, genital herpes and HIV co-infection was 4%. Clinical manifestations of genital ulcers in syphilis and genital herpes infections will facilitate the transmission of HIV. HIV infection also associated with increased of viral load and bacterial shedding from HSV and syphilis infections.<sup>22-25</sup>

#### V. CONCLUSION

The proportion of STI among MSM relatively high. Unprotected anal intercourse is a high-risk practice for STI transmission.

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