Opportunistic infection of HIV/AIDS patients in West Papua

A M Witaningrum1*, S Q Khairunisa1, M Q Yunifar1, R Bramanthi2, B E Rachman3,4 and Nasronudin1,3,4*

1Institute of Tropical Disease, Airlangga University, Surabaya, Indonesia
2 Sele be Solu Hospital, Sorong, West Papua, Indonesia
3 Faculty of Medicine, Airlangga University, Surabaya, Indonesia
4 Airlangga Health Science Institute, Airlangga University, Surabaya, Indonesia

Telp. 62-31-5992445-46 fax. 62-31-5992445
*Corresponding author: adiana_mutam@yahoo.co.id

Abstract. Human immunodeficiency virus/acquired immune deficiency syndrome (HIV/AIDS) had a major impact on health problem in Indonesia. HIV type 1 (HIV-1) epidemic is currently infected with HIV viruses developing rapidly in Indonesia. Papua provinces have the highest prevalence rate of human immunodeficiency virus type 1 (HIV-1) infection in Indonesia; however, data on opportunistic infection of HIV-1 are limited. The study using medical records as a research sample was conducted among HIV patients from January 2013 - December 2014 in Sele be Solu hospital among 49 patients. Opportunistic infections commonly occur in HIV-infected patients. The aim of the study was to know the prevalence of opportunistic infection among HIV positive patients in West Papua. Forty-nine HIV-1 patients were collected in Sele be Solu Hospital, West Papua. Opportunistic infection was identified such as tuberculosis, tuberculosis Pulmo, tuberculosis and candidiasis, candidiasis and diarrhea. The clinical sign appeared in HIV infected patients such as itchy, cough and loss weight. The prevalence of opportunistic infection indicated the necessity of monitoring the opportunistic infection of HIV/AIDS patients in Indonesia.

1. Introduction
UNAIDS reported people living with human immunodeficiency virus (HIV) was estimated to be 640,000 in Indonesia at the end of 2013.[1] UNAIDS has said that HIV/AIDS in Indonesia is one of fastest growing epidemics in Asia. In addition, the newly infected number of individuals with HIV increased from 29,000 individuals in 2001 to 76,000 individuals in 2012 in Indonesia [2], indicating the rapidly growing epidemic of HIV infection in this country. Human immunodeficiency virus (HIV) associated opportunistic infection remains a problem in the world as well as Indonesia. The provinces of Papua and West Papua are reported to have the highest HIV prevalence rate (2.4%) in the general population aged 15–49 years old among the different provinces in Indonesia.[3]

Acquired immunodeficiency syndrome (AIDS) is a disease of the human immune system caused by human immunodeficiency virus (HIV). HIV is a slow-growing retrovirus causing progressive immunodeficiency ultimately developing AIDS. The virus infects cells expressing CD4 membrane receptor molecules, such as T helper cells, macrophages, dendritic cells and microglial cells, but also requires another membrane chemokine coreceptor molecule CCR5 or CXCR4 for entry. The normal range of CD4+ T helper cells in a healthy person is 500-1600 cells/µl of blood, which gradually...
depletes with the progression of HIV infection rendering the patient susceptible to opportunistic infections (OIs). The course of HIV infection involves three stages: acute infection, asymptomatic phase, and full-blown AIDS. the virus replicates in the acute phase, resulting in high viral load and increased risk of transmission.[4]

Human immunodeficiency virus is pathogenic virus infections which are caused by viral diseases have high morbidity and mortality rates. At an advanced stage, this HIV infection causes sufferers in AIDS conditions that will decrease the number of CD4 cells so that the immune system decreases and will increase the risk of opportunistic infections.[5] The mortality rate due to HIV-AIDS infection is reported to be quite high in Indonesia.[6] Opportunistic infections (OIs) are infections that occur more often or are more severe in people with weakened immune systems than in people with healthy immune systems. A weakened immune system makes it harder for the body to fight off HIV-related OIs. HIV-related opportunistic infections include pneumonia, *Salmonella* infection, candidiasis and tuberculosis.

The World Health Organization (WHO) estimates that TB is the cause of death for 13% of persons with AIDS.[7] TB infection occurs when a susceptible person inhales droplet containing *Mycobacterium tuberculosis* organisms, generated when persons with pulmonary or laryngeal TB a diseased cough. The immune response limits multiplication of tubercle bacilli usually within 2-12 weeks after infection. However, viable bacilli persist for years; a condition referred to as latent TB infection (LTBI). Persons with LTBI are asymptomatic and are not infectious. TB disease can develop immediately after exposure (primary disease) or after reactivation of LTBI (reactivation disease). The primary disease accounts for one third or more of cases of TB disease in HIV-infected populations.[8]

Overall case rates of TB in the United States are declining, with 4.4 new cases of TB disease per 100,000 population (a total of 13,299 cases) reported in 2007 and an estimated 4.0% prevalence of LTBI in the general population. Similarly, health-care-associated outbreaks of TB are now uncommon in the United States, partly because of improved public health and hospital TB-control programs. The percentage of patients with TB and with known HIV infection also decreased from 15.0% in 2003 to 12.4% in 2006, although the percentage of TB cases with unknown HIV status increased from 28.7% in 2005 to 31.7% in 2006, which might reflect either a lack of HIV testing or incomplete reporting of HIV test results.[9]

The estimated annual risk for active TB among persons with LTBI in the general population is 12.9 per 1,000 person-years of observation. In contrast, rates of progression to active TB among HIV-infected persons with LTBI have ranged from 35 to 162 per 1,000 person-years of observation. Unlike other AIDS-related OIs, the CD4+ count is not a reliable predictor of increased risk for TB disease in HIV-infected persons. In both TB-endemic and non-TB-endemic areas, patients can have relatively high CD4+ counts at the time HIV-related TB disease develops. As with HIV-uninfected persons, HIV-infected persons who live or work in high-risk congregate settings such as correctional facilities, health-care facilities, drug-treatment units, or homeless shelters are at increased risk for acquiring TB.[10]

Oropharyngeal and esophageal candidiasis is common in HIV/AIDS patients. The majority of infection is caused by *Candida albicans*. Fluconazole (or azole) resistance is predominantly the consequence of previous exposure to fluconazole (or other azoles), particularly repeated and long-term exposure. In this setting, *C. albicans* resistance has been accompanied by a gradual emergence of non- *albicans* *Candida* species, particularly, *glabrata*is a cause of refractory mucosal candidiasis, particularly in patients with advanced immunosuppression. The occurrence of oropharyngeal or esophageal candidiasis is recognized as an indicator of immune suppression, and these are most often observed in patients with CD4+ counts <200 cells/µL. In contrast, vulvovaginal candidiasis is common among healthy, adult women and is unrelated to HIV status. Recurrent vulvovaginal candidiasis alone should not be considered a sentinel of HIV infection among women. The introduction of ART has led to a dramatic decline in the prevalence of oropharyngeal and esophageal candidiasis and a marked diminution in cases of thererfractory disease.[11]
In 2004, the World Health Organization (WHO) identified HIV/AIDS as the world’s most urgent public health challenge, as AIDS represents the greatest lethal epidemic in recent history. The gastrointestinal (GI) tract is a major site of disease in HIV infection almost half of all HIV-infected patients present with GI symptoms, and almost all patients develop GI complications. GI symptoms, such as anorexia, weight loss, dysphagia, odynophagia, abdominal pain, and diarrhea, are common and usually non-specific in this population.

2. Method
Descriptive retrospective design using medical records as a research sample was conducted among HIV patients from January 2013 - December 2014. The study was conducted in Sele be Solu hospital among 49 patients.

3. Result
The study collected 49 patients from January 2013-December 2014 in Sele be Solu Hospital. There are some ethnic in West Papua such as Asmat, Java, and Bugis. The highest risk factor for HIV infection from heterosexual. Symptoms occur in people living with HIV are itchy, cough and loss weight.

| Table 1. Demography of HIV/AIDS patients in West Papua. |
|-------------------------------------------------------|
| all (n=49)                                             |
| Mean age (years)                                      | 30.5 |
| Gender                                                |     |
| Male                                                  | 29(59.2%) |
| Female                                                | 18(36.7%) |
| Ethnic                                                |     |
| Asmat                                                 | 9(18.4%) |
| Jawa                                                  | 3(6.1%) |
| Bugis                                                 | 2(4.1%) |
| Transmission                                          |     |
| Heterosexual                                          | 32(65.3%) |
| Homosexual                                             | 2(4.1%) |

| Table 2. Opportunistic infection and aclinical sign of HIV/AIDS patients in West Papua. |
|-------------------------------------------------------------------------------------|
| all (n=49)                                                                           |
| HIV Opportunistic Infection                                                          |     |
| Tuberculosis                                                                         | 11(22.4%) |
| Lung tuberculosis                                                                    | 3(6.1%) |
| Tuberculosis and Candidiasis                                                         | 2(4.1%) |
| Candidiasis                                                                          | 5(10.2%) |
| Diarrhea                                                                             | 3(6.1%) |
| Clinical sign                                                                        |     |
| Itchy                                                                                | 1(2%) |
| Cough                                                                                | 6(12.2%) |
| Loss weight                                                                          | 1(2%) |

Results of this study, there are various types of opportunistic infections in HIV patients, such as tuberculosis, tuberculosis Pulmo, candidiasis, tuberculosis and candidiasis, diarrhea. There are 24(49%) cases of HIV-opportunistic infection. Tuberculosis was dominantly coinfected, 11 (22.4%) people with HIV-Tuberculosis-infection and mostly in 25-53 years old.
4. Discussion

Human immunodeficiency virus (HIV) associated tuberculosis (TB) remains a major global public health challenge. An estimated of 2.6 million individuals had become newly infected with HIV, and 1.8 million had died of AIDS in that year alone.[1] TB is the most common opportunistic infection (OI) among HIV-infected individuals, and co-infected individuals are at high risk of death. The estimates of the global burden of disease caused by TB in 2009 were as follows: 9.4 million incident cases (range 8.9-9.9 million), 1.3 million deaths among HIV-negative TB patients (range 1.2-1.5 million) and 0.38 million deaths among HIV-positive TB patients (range 0.32-0.45 million). Most TB cases were in South-East Asia, African and Western Pacific regions (35, 30 and 20%, respectively). An estimated 11-13 percent of incident cases were HIV-positive. TB may occur at any stage of HIV disease and is frequently the first recognized presentation of underlying HIV infection. As compared to people without HIV, people living with HIV (PLWH) have a 20-fold higher risk of developing TB, and the risk continues to increase as CD4 cell counts progressively decline.

Mycobacterium tuberculosis is an acid-fast bacillus responsible for highest mortality rate among people with HIV/AIDS. It is quite prevalent (33%) among patients with full-blown AIDS. TB is a lung infection, but it occurred as extrapulmonary and disseminated at late stages of HIV/AIDS. TB can attack patient at any CD4+ T cell count; however, patients having low CD4+ T cell count<200 cells/µl of blood are at greater risk of contracting it. TB infection supports HIV-1 replication and dissemination through dysregulation of host cytokines, chemokines, and their receptors. It is also responsible for activation of latent HIV-1 infection. Co-infection of HIV and TB renders high mortality rate among patients in resource-limited countries such as South Africa and India. It is difficult to treat MDR and XDR TB due to extreme toxicity and resistance towards drugs, even where HIV patients are on ART. It is recommended to treat patients (CD4+ T cell count<200 cells/µl) with antiviral and anti-TB therapy concurrently to achieve substantial results.

Candidiasis is caused by yeasts Candida species, which are normal residents of the human body. In HIV infection, mucocutaneous candidiasis occurs in three forms: oropharyngeal, esophageal and vulvovaginal disease. There are many species of Candida such as C. albicans, C. glabrata, C. parapsilosis, C. tropicalis, C. krusei, etc. responsible for candidiasis; however C. albicans is significantly important due to its intense association with AIDS. It is more prominent among patients having low CD4+ T count, <200 cells/µl of blood. High levels of HIV-1RNA in plasma increases susceptibility to candidiasis. The relationship between HIV and vulvovaginal disease is unclear as vulvovaginal candidiasis is also frequent in normal women. Introduction of combinational ART has significantly declined the prevalence of candidiasis in HIV patients.

Gastrointestinal Infections are very recurrent in patients living with HIV/AIDS. It had been reported that in AIDS patients the occurrence of Diarrhea in developed countries is 30-60 per cent whereas it is 90% in developing countries. C. parvum (54%) was the predominant pathogen among the opportunistic parasites. Several studies from India and other parts of the world also have reported the same. In our study, Diarrhea presented as third commonest OI with 14.53% cases.

5. Conclusion

Opportunistic infections are very difficult to treat in HIV patients. This is due to the absence of normal functioning immune system. With the introduction of combinational Antiretroviral Therapy (ART), the incidence of OIs can be declined. The various types of opportunistic infections in HIV patients, from this study, are tuberculosis, candidiasis, and diarrhea.

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