JURNAL KESEHATAN
JURNAL ILMU-ILMU KEPERAWATAN, KEBIDANAN, FARMASI & ANALIS KESEHATAN
DOI : https://doi.org/10.52221/jurkes
JURKES
ISSN : 2089-3906

Anti-Streptolysin O in Human Immunodeficiency Virus Patients

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Article Information

Revised: October 2024
Available online: October 2024

Keywords

ASTO, HIV, *Streptococcus*, Antibody, Antigen

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ABSTRACT

Human Immunodeficiency Virus (HIV) is a pathogenic virus that attacks and damages the human immune system so that the body becomes weak in fighting viral or bacterial infections. *Streptococcus β hemolyticus Group A* is one of the pathogenic bacteria that can infect humans, especially in people with weak immune systems. Patients infected with Group A *Streptococcus β hemolyticus* bacteria have Streptolysin O antibodies in the serum, which will be detected by ASTO examination. The purpose of this study was to determine the description of Anti Streptolysin O examination in HIV patients at Imbanagara Health Center. This research method is descriptive, with a sample size of 35 HIV-positive people in Imbanagara. Measurements used qualitative and semi-quantitative procedures with a black background slide instrument. The examination was conducted at the Imbanagara Health Center in June 2023. The results of this study obtained positive results for as many as three people (9%) with an average ASTO level of 400 IU/mL and negative results for as many as 32 people (91%).

INTRODUCTION

Human Immunodeficiency Virus (HIV) is a virus that is the main cause of Acquired Immunodeficiency Syndrome (AIDS). This virus can cause death indirectly, and the level of immunity of a person affected by this virus decreases because the virus attacks leukocyte cells in the body, making the person unable to resist viral/bacterial infections that can cause disease. So, at risk of exposure to various diseases, when this condition occurs the patient will experience pain, which can also lead to death (Dinarohmayanti et al., 2014).

According to the Ministry of Health, in 2021, there were 36,902 cases of Human Immunodeficiency Virus infection; most of the patients were of productive age, with the age range of 25-49 years as the largest contributor to cases of HIV patients with a percentage of 69.7%, 16.9% at the age of 20-24 years, 8.1% of patients aged over 50 years, under four years 3.1%, 3.1% and 4.1% occurred at the age of 15-19 years (Trisna et al., 2022). In 2021, in West Java Province, there were 5,444 HIV-positive people, and in 2022, from January to June, there were 3,744 new cases (Nuraini et al., 2022). According to the Ciamis Regency Health Office, in 2013-2022, HIV cases in Ciamis Regency were recorded as many as 543 sufferers, including men totalling 366 individuals and women 177 individuals, at the Imbanagara Health Center. There were 55 people positively infected with HIV, including 43 men and 12 women (Dinas Kesehatan Ciamis, 2023).

HIV infection is transmitted through body fluids containing HIV, the body fluids in question are blood, semen and vaginal secretions that the HIV has infected; having sexual intercourse with people who have been exposed to HIV is one example of how the virus is transmitted (Harahap, 2021). After the virus is in the human body, CD4 lymphocytes, one part of leukocyte cells, will be attacked by HIV. CD4 lymphocyte cells have a role as controllers of the immune system in the body, and if attacked by HIV, the body's immunity becomes impaired, causing a decrease in the immune system (Marlinda & Azinar, 2017).

When a person is infected with HIV, the person will experience a decrease in the immune system. Due to decreased immunity, patients can be infected with microorganisms from outside easily caused by viruses, fungi and bacteria; these microorganisms can infect various organs in the body; more precisely, HIV patients are susceptible to disease, allowing HIV patients to be infected with group A Streptococcus β hemolytic (Huda et al., 2018).

Group A Streptococcus β hemolyticus bacteria are bacteria that attack and infect the body, consisting of gram-positive aerobes and gram-negative aerobes. About 50%-80% of infections are caused by group A Streptococcus β hemolyticus bacteria. Symptoms arising from Streptococcus bacterial infection of human skin and throat include fever, difficulty swallowing, red spots in the throat, no appetite, nausea, fatigue and swollen lymph nodes. Generally, Streptococcus infection is more sensitive when it occurs in individuals who have a lack of immune system, but when it occurs in cancer and HIV patients, it is more likely that invasive Streptococcus infections are much more serious, the diseases that arise are impetigo, laryngitis, pharyngitis, puerperal fever, scarlet fever,

necrotizing fasciitis, toxic shock syndrome and septicemia (Isnaeni et al., 2021).

Group A Streptococcus β hemolyticus bacteria produce antibodies that can be detected by streptolysin O antigens contained in the ASTO (Anti Streptolysin O) examination. ASTO examination is a blood test performed to measure antibodies to Streptolysin O produced by Streptococcus bacteria; thus, the body's ASTO levels react to group A Streptococcus β hemolytic bacteria (Fusvita & Susanti, 2017).

Previous researchers conducted research on the ASTO Examination Overview (Anti Streptolysin O) Latex Agglutination Method in Heart Failure Patients at RSUD Dr. M. Yunus Bengkulu, with the results of three positive people infected with Streptococcus bacteria with a percentage value of 10% and 27 negative people infected with Streptococcus bacteria with a percentage value of 90%(R. Susanti & Aprillia, 2019). This study aims to determine the description of Anti Streptolysin O in Human Immunodeficiency Virus patients at the Imbanagara Health Center.

METHOD

This study aims to determine whether the design design of the study was descriptive with a purposive sampling approach. The sample in this study was HIV-positive patients in Imbanagara, Ciamis Regency, with a total of 35 respondents. This research was conducted at the Imbanagara Health Center Laboratory in June 2023. ASTO examination using the latex agglutination method qualitative and semi-quantitative procedures with the instrument used is a black background slide. The data obtained from this study are presented in tabular form and processed descriptively using percentage calculations on data groups based on positive agglutination results based on levels. cription of Anti Streptolysin O in Human Immunodeficiency Virus patients at the Imbanagara Health Center.

RESULTS AND DISCUSSION

From the research that has been carried out, the characteristics of the research respondents are as follows:

Tabel 1. Characteristics of Respondents

No	Characteristics of the Sample	Total (n)	Presentase (%)	Mean
1	**Gender**			
	Male	26	74	
	Female	9	26	
2	**Age**			32
3	**Moderate/Have had inflammation of the throat**			
	Yes	35	100	
	No	0	0	
4	**History of Acute Respiratory Infection (ARIs)**			
	Yes	0	0	
	No	35	100	

Based on Table 1, it can be seen that those sampled in the study were male as many as 26 people (74%) and female as many as 14 people (26%); out of 35 respondents, 3 (9%) people were experiencing inflammation of the throat while the remaining 32 (91%) people were not experiencing laryngitis, but all of them had experienced laryngitis. According to the results of the questionnaire given by the

researcher, 35 respondents did not previously have a history of ARIs disease; the average age of respondents sampled in this study was 32 years old.

Individuals who have weaker immune characteristics will increase the risk of Streptococcus bacterial infection; one of the diseases that arises due to bacterial infection is ARIs. ARIs is an infectious condition that attacks the respiratory tract, both upper and lower, and often causes inflammation of the throat. The infection is caused by viruses/bacteria that colonize the person's throat, especially Streptococcus bacteria (Nurcahyati et al., 2019).

Table 2. Results of ASTO Examination in HIV Patients

Examination Results	Frequency (n)	Percentage (%)	ASTO Level (IU/mL)		
			Range	Min	Max
Positive	3	9	400	400	400
Negative	32	91	-	-	-
Total	**35**	**100**			

Based on Table 2, the results of the Anti Streptolysin O examination in HIV patients at the Imbanagara Health Center obtained positive results for ASTO in as many as three people with a percentage (9%), the ASTO levels in the three respondents were the same, namely at a titer of 400 IU/mL. These results indicate that sometime before, there was an acute infection of Streptococcus bacteria. Because the ASTO titer is more than 200 IU/mL and 32 people had a presentation (91%), the results were negative. Increased ASTO levels in HIV patients indicate that these patients have experienced or are currently infected with group A Streptococcus bacteria, which often infect the respiratory tract; 35 about 50-80% of upper respiratory tract infections are caused by group A Streptococcus β Hemolyticus bacteria (Sari, 2020).

The mechanism of Anti streptolysin O formation in the body occurs when the body is infected with group A Streptococcus bacteria; the body produces antibodies against the Streptolysin O toxin, called Streptolysin O or ASTO (Rachmadi, 2010). The ASTO titer is a test that measures these antibodies in the blood serum. Antibody levels begin to rise within 1-3 weeks after Streptococcal infection, peak within 3-5 weeks, and then return to insignificant levels for 6-12 months, so a positive test can indicate group A Streptococcus and can support the diagnosis of complications of Post Streptococcal infection. If too many people are exposed to these bacteria without symptoms, the presence of ASTO by itself does not indicate disease. Still, a titer of more than 200 IU/mL is generally considered a definite increase, and the ASTO test is positive. (S. Susanti et al., 2022).

Factors that cause HIV-positive patients to be infected with Streptococcus bacteria are a decrease in CD4 due to HIV infection. It can change the rate of salivary flow and damage the secretory immune system, thus contributing to increased colonization of Streptococcus bacteria in the oral cavity, while factors that cause HIV-positive patients to be negatively infected with Streptococcus bacteria are because patients

routinely undergo ARV (Antiretroviral) therapy, This therapy is part of HIV treatment that aims to reduce the risk of HIV transmission, inhibit opportunistic infections (fungal, parasitic and bacterial infections), reduce the amount of virus (viral load) in the blood to undetectable and improve the quality of life of HIV patients so as to minimize the possibility of HIV patients being infected with viruses, fungi and bacteria from outside, one of which is Streptococcus bacteria which are often the main cause of upper respiratory tract infections in humans. (Makatempuge et al., 2023).

The limitation of this study is the difficulty of finding HIV patients who are willing to volunteer to be the subject of research. Therefore, the personal data of respondents is confidential to maintain the privacy of those who have volunteered to be respondents in this study.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the study Overview of Anti Streptolysin O Examination in Human Immunodeficiency Virus Patients at the Imbanagara Health Centre, the qualitative examination results obtained three people (9%) with positive ASTO results with an average ASTO level of 400 IU/mL and 32 people (91%) negative ASTO results. For further researchers to conduct an Anti Streotolis in O examination in HIV patients who are undergoing antibiotic treatment due to Streptococcus bacterial infection.

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