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CD4 Increase in HIV/AIDS Patients: A Systematic Review

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ABSTRACT

Introduction: Acquired Immunodeficiency Syndrome (AIDS) is a collection of symptoms and infectious diseases caused by damage to the human immune system due to infection with the HIV (Human Immunodeficiency Virus). The type of CD4 T lymphocyte cell is the main target of the HIV virus in infecting the human body. The lower the number of CD4 T lymphocytes in the blood, the lower a person's immune system will be**. Methods:** The authors conducted an article search beginning on June 10 using research in an electronic database. The Identified Article is a research study that investigates CD4 cell elevation in HIV/AIDS patients. Systematic compilation begins with search databases on Google Scholar, PHPJ, PubMed. the method is based on a prismatic systematic guideline and is systematically reviewed**. Discussion:** The results of this study indicate that the more progressive the HIV infection in a person's body, the lower his CD4 level will be. A decrease in CD4 levels will be followed by a decrease in the number of lymphocytes, the ratio of lymphocytes to leukocytes, and the ratio of lymphocytes to neutrophils. This shows that the immune system of people infected with HIV is decreasing. **Conclusion:** The more severe the condition of people with HIV infection, the lower the CD4 count. Complete blood counts were performed automatically using Abbott Diagnostics' CELL-DYN Ruby Hematology Analyzer.

Keywords: CD4, HIV, and AIDS

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INTRODUCTION

The human immunodeficiency virus (HIV) is a retrovirus belonging to the family of lentiviruses. HIV cause severe damage to the immune system and eventually destroys it. According to HIV Estimations for the year 2012, the adult (15- 49 years) HIV prevalence at national level continued its steady decline CD4 cells are destroyed, the weaker the immune system becomes. Thus the sufferer becomes susceptible to diseases. Significant effects of CD4 count of the HIV/AIDS patients upon each domain of their quality of life was found in the present study. In each domain, positive correlation was observed between the CD4 count. Relationship between quality of life and immunological factors, such as CD4 count, or virological factors, such as viral load. They made an opinion that it is still likely that the experience of symptoms, variables clinically related to immunological and virological parameters are actually most responsible for the variance in quality of life.

METHOD

The search for articles started on June 10 using predefined keywords namely HIV/AIDS. The preparation of a systematic review begins with a database search on Google Scholar, PHPJ, PubMed. Search using keywords: CD4, HIV and AIDS. The inclusion criteria in writing this article are in 2012-2021, in full English text. Meanwhile, the exclusion criteria set were articles that discussed the relationship between CD4 cell from the estimated level of 0.41% in 2001 to 0.27% in 2011. The aim of this study was to assess the Quality of life of the

HIV/AIDS patients receiving ART along with a specific objective, to find out the influence of CD4 count on their quality of life.

HIV virus destroys the immune system by infecting and destroying cd4 cells. The more counts in HIV/AIDS sufferers. The method of preparing this systematic review is based on the prismatic guideline systematic method. Review articles were issued as well as case reports and studies focusing on the definition of HIV/AIDS, research articles on CD4 HIV/AIDS in adults. The identified articles were systematically reviewed and references to the included papers were also checked.

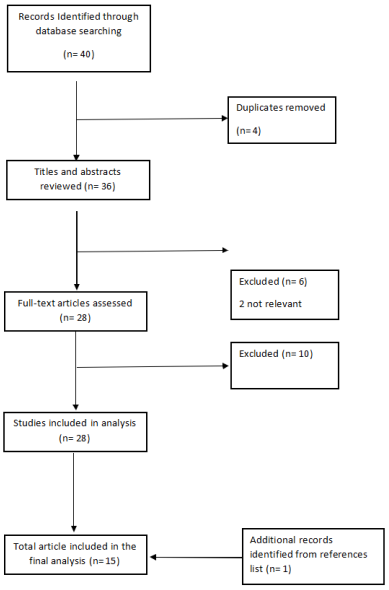

Figure 1. The workflow of systematic search and analysis

DISCUSSION

Overall, there are 10 case studies and 5 literature studies. One study took a case study and literature approach. Literature study, the follow-up time was considered adequate. all studies clearly defined criteria for inclusion. Study subjects and settings were described in detail and measurements were carried out according to standard methods. Accurate measurements together with proper use of statistical analysis produce valid and reliable results from review studies.

Human Immunodeficiency Virus (HIV) is a virus that infects cells of the immune system destroying or impairing the function of these cells. Infection with the HIV virus results in a progressive decline of the immune system, leading to immune deficiency. The immune system is considered deficient when it can no longer fulfill its role of fighting infection and disease (WHO, 2017). HIV infection can progress to Acquired Immune Deficiency Syndrome (AIDS) which is the final stage of HIV infection where there are symptoms of a decrease in the body's immune system. HIV transmission can occur through direct contact between the inner layers of the skin (mucous membranes) or the bloodstream, with body fluids that contain HIV, such as blood, semen, vaginal fluids, presemmal fluids, and breast milk.

The HIV virus infects T-helper lymphocytes through the cluster of differentiation 4 (CD4) receptors located on the surface of T-helper cells. The HIV virus that binds to the CD4 receptor complex will convert RNA genetic material into DNA and multiply, T-helper lymphocytes are damaged, CD4 counts drop and result in a weakened immune system. CD4 is the best parameter to measure immunodeficiency and also an early indicator of disease progression.

The factors that have an effect on CD4 levels in HIV patients based on previous studies are the initial CD4 count and gender. CD4 levels of HIV/AIDS patients are also indirectly related to nutritional status.

Human Immunodeficiency Virus (HIV), one of the worst pandemics, in the world today is having devastating physical and psychological effects. Due to early detection and availability of antiretroviral treatment (ART), HIV has become a chronic disease rather than a fatal disease. Consequently, quality of life is an important component in evaluating a patient's well-being after HIV infection. The quality of life of people infected with HIV is largely determined by the CD4 count and advanced HIV infection requires attention and care more than the physical, psychological, environmental, and social aspects of life. Therefore, this information can be used in planning various services including primary medical care, financial assistance, housing, food, child care, and educating patients how to stay healthy..

CONCLUSION

The titles and abstracts reviewed 36 journal and the excluded are 6. Full text articles assed are 28 from that journal we remove or eliminate 10. studies included in analysis are 28 journal and the total article includede in the final analysis are 15 journal. The articles and the journal are sourced by NCBI article, Google Scholar, and PubMed. Based on the literature and case studies that we analyzed, about the increasing CD4 cells in HIV/AIDS patients. So, the target should be maintain the CD4 count of the HIV/AIDS

patients in a higher level by reducing the viral replication with regular and strict monitored therapy with Antiretroviral medication.

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Table 1. The study of Frequency in CD4 increase in HIV/AIDS (adolescent)

No.	Author (year), ref.	Study design	Study subjects (numbers)	Frequency of CD4 increase in HIV/AIDS patients and other findings*
1.	Dini Wurnaning Budi, RR. Sri Ratna Rahayu, Ari Yuniastuti 2021	L	CD4 : 68 HIV : 54 AIDS : 35	CD4 : +
2.	Sudhir Gowda, Ashok Nagaralu Channabasappa, Murali Dhar, Deepa Krishna. 2012	SK	CD4 : 61 HIV : 51 AIDS : 22	CD4 : +
3.	Kusman Ibrahim, Yusshy Kurnia H, Laili Rahayuwati, Baiq Emi Nurmalisa, Siti Ulfah Rifa'atul Fitri. 2017	L	CD4 : 62 HIV : 44 AIDS : 67	CD4 : -
4.	Supantha Chatterjee, Fasihul Akbar, Nivedita Das, Kuntala Ray, Sanjib Bandyopadhyay, Manish Kumar Singh. 2016	L	CD4 : 39 HIV : 42 AIDS : 30	CD4 : +
5.	Dept. of statistics, Bahir Dar University, Ethiopia. 2021	SK	CD4 : 60 HIV : 47 AIDS : 14	CD4 : -
6.	Dr. Ashwini Metry, Dr. Jairaj Bhaskar and Dr. Shantkumari B. 2021	L	CD4 : 67 HIV : 49 AIDS : 21	CD4 : +
7.	Sukeshani Salwe, Amitkumar Singh, Varsha Padwal, Shilpa Velhal, Vidya Nagar, Priya Patil, Alaka Deshpande, Vainal Patel. 2019	SK	CD4: 159 HIV: 298 AIDS: 15	CD4 : +
8.	Renata Aurelina, 2020	L	CD4 : 39 HIV : 62 AIDS : 30	CD4 : the higher the CD4 count before giving ART, it will be high also the increase that will occur.
9.	Thatit Nurmawati, Yeni Kartika Sari, Aprilia Putri Hidayat 2019	SK	CD4 : 36 HIV : 26	CD4 : -
10.	Indria Yogani, Teguh Harjono Karyadi, Anna Uyainah, Sukamto Koesnoe 2015	SK		
11.	Rini Aptriani, Fridayenti, Alex Barus 2013	SK	CD4 : 65 HIV : 21 AIDS : 127	CD4 : +
12.	Mirna Widyanti, Samuelo Sandy, Eva Fitriana 2015	SK		
13.	Gang Zhang, Grant R Campbell, Qiangzhe Zhang, Erin Maule, Jonathan Hanna, Weiwei Gao, Liangfang Zhang, Stephen A Spector	SK	CD4: 54 HIV: 197 AIDS: 10	CD4 : +
14.	Festy Ladyni, Anisa Kristianingsih	L	HIV/AIDS : 67	CD4 : -
15.	Steven A. Yuki, Phillipp Kaiser, Peggy Kim, Sushama Telwatte, Sunil K. Joshie, Mai Vu, Harry Lampiris, Joshep K. Wong 2018	SK	CD4 : 15 HIV : 12	CD4 : +