DOI: https://doi.org/10.53350/pjmhs20221611490

ORIGINAL ARTICLE

Frequency of Neutropenia in HIV Patients in Tertiary Care Hospital

SALIHA SYED[1], SHAHTAJ KHAN[2], ANSA KULSOOM REHMAN[3], SUNDAS IFTIKHAR[4], LAILA BHADUR[5], HIRA AROOJ[6]
[1]*FCPS Haematology*
[2]*Professor of Pathology (Haematology) Hayatabd Medical Complex, Peshawar*
[3]*AssistantProfessor (Haematology) Kabir Medical College/MMC General Hospital*
[4]*FCPS Haematology Institute of Kidney Diseases*
[5]*MPhil FCPS Haematology*
[6]*MBBS, PG Resident Haematology*
Corresponding author: Hira Arooj, Email: harooj8@gmail.com

ABSTRACT

Introduction: HIV is the systemic illness known as acquired immune deficiency syndrome (AIDS). According to the report of World Health Organization, 33.2 million people has infected by Human Immunodeficiency Virus.
Objective: To determine the frequency of neutropenia in HIV patients in tertiary care hospital.
Material and method: The current study was Descriptive, cross sectional study. It was carried out in Hematology department, Hayatabad Medical Complex, Peshawa from 30/10/2018 to 30/4/2019. The demographic and clinical data of all patients including age, gender, occupation, residence, neutrophil count and HIV status were recorded on predesigned proforma. The study data was analyzed using SPSS version 17.
Results: In our study, totally 114 patients were included. There were 71(62%) male patients and 43(38%) female patients in our study. Based on neutropenia status 17(15%) patients were observed with neutropenia whereas 97(85%) patients were not observed with neutropenia
Conclusion: Our study concludes that the frequency of neutropenia was 15% in HIV patients in tertiary care hospital.
Keywords: neutropenia, HIV, AIDS, Prevalence

INTRODUCTION

According to the report of World Health Organization, 33.2 million people has infected by Human Immunodeficiency Virus (HIV), hence global pandemic term is used to it[1]. Unfortunately, the developing countries are more heavily affected than developed countries[2]and is responsible for over 24 million deaths worldwide[3].

HIV is the systemic illness known as acquired immune deficiency syndrome (AIDS). It is distinguished by significant dysfunction and increasing humoral and cellular defence response damage. HIV replicates in CD4+ lymphocytes, macrophages and dendritic cells[4]. This replication causes progression of disease which is distinguished by CD4+ T cells depletion. Amongst people infected by HIV, increased mortality is caused by opportunistic infections that are secondary to immune suppression. However anti- retroviral therapy (cART) in combination can be used for this progression [3]. Hematological abnormalities caused by HIV infection include reduced numbers and altered functioning of all blood cell types, including red blood cells (anaemia), platelets (thrombocytopenia) and white blood cells (lymphopenia and neutropenia) which are collectively known as cytopenians [5]. It is the most common complication of HIV[6]. Cytopenia increase in frequency as HIV progress from asymptomatic to full blown disease and are often fatal without intervention. Cytopenias are also effected by various other factors like race, sex, ethnicity and comorbidities like TB, hepatitis B infection, oral candidiasis and fever[5].

Neutropenia is defined as ANC below 1.5x10/L[7]. Neutropenia is commonly observed in HIV infection. About 70% of patients in advance stages of the disease present with low neutrophil count[8]. Multiple factors are involved in causing neutropenia in HIV including the toxicity of virus to Haematopoietic tissue, HIV related autoimmune disorders, the therapeutic usage of mylotoxic agents, complication with opportunistic infection, malignancy and patients association with confounding agents that impairs mylopoiesis [9]. Along with neutropenia, HIV-infected individuals also exhibit abnormalities in function of neutrophil, including decreased bactericidal activity, improper degranulation, defective chemotaxis, inefficient phagocytosis, and decreased generation of free oxygen radicals[10]. The host becomes more vulnerable to infections due to the decrease of neutrophil phagocytic defence and the lack of adaptive immunity. Neutropenia also affects the management of primary HIV infection and the associated secondary infections because neutropenia is a dose-limiting phase for numerous antimicrobial drugs[9].

According to a survey conducted in India in 2015 the frequency of neutropenia in patients infected by HIV was 8% comparable with the study of Choi et al 10%[10]. Another study conducted in South West Africa in 2017 neutropenia in HIV infected patients was reported as 11% at ART initiation[11]. Another study conducted out on HIV infected children in West Bengal India in 2014 report neutropenia in 19%of children[12].

Therefore, keeping in view the above mentioned facts and figures, my study is designed to determine the current magnitude of neutropenia in HIV patients coming to tertiary care hospital. This work will be helpful in the clinical context since a more effective treatment in this situation requires a diagnostic strategy connected to the haematological effects of HIV infection. The findings of this research will be made known to healthcare experts so that they may adjust their methods as necessary.

MATERIALS AND METHODS

The current study was Descriptive, cross sectional study. It was carried out in Hematology department, Hayatabad Medical Complex, Peshawar. The study duration was Six months from 30/10/2018 to 30/4/2019. By using WHO sample size calculator, the overall sample size was 114. The inclusion criteria for our study was all the patients of either gender, newly diagnosed HIV patients on ELISA having age 18 – 60 years. The exclusion criteria for our study was all the patients having Malignancies not related to HIV(By taking History and evaluating medical records) and Patients who are receiving Antiviral therapy (AVT).

Approval of the study was obtained from Medical and Ethics committee of the hospital. All the individuals presenting with HIV in Hayatabad Medical Complex during my study period were enrolled in the study. The purpose and procedure of the study was explained and informed consent was obtained from the patient justifying the inclusion criteria.

After interviewing, they were allotted a donor id number which was noted. The demographic and clinical data of all patients including age, gender, occupation, residence, neutrophil count and HIV status were recorded on predesigned proforma. The diagnosis of HIV status was done on ELISA and neutrophil count was determined by CBC using a routine autoanalyzer Cell Dyne Ruby. Cell Dyne Ruby is a multi parameter automated analyser intended for in vitro diagnostic test in clinical laboratory. This system was designed to analyse EDTA anticoagulated blood and reports Red cell parameters (RBC count, Haematocrit, MCV, RDW),

Haemoglobin parameters (Hb, MCH, MCHC), White blood cell count and Platelet count.

The study data was analyzed using SPSS version 17 for windows. Frequencies and percentages were calculated for variables such as gender, travel history, IV drug abuse and HIV confirmed on ELISA while the numerical variables such as age and neutrophil count were presented with mean ± SD.

RESULTS

In our study, totally 114 patients were included. There were 71(62%) male patients and 43(38%) female patients in our study. (Figure 1) The Mean age (±SD) in our study was 32 (± 3.51). On the basis of age distribution, 26(23%) patients were observed in 18-30 years age group, 43(38%) patients were 31-40 years old, and 23 (20%) patients were 41-50 years old whereas 22 (19%) patients were observed in age range of 51-60 years. (Figure 2) Based on travel history 82(72%) patients were observed with positive history of traveling while 32(28%) patients were observed with negative history of traveling. (Figure 3) Based on IV drug abuse, 9(8%) patients were observed with IV drug abuse whereas 105(92%) patients were not observed with IV drug abuse. (Figure 4) Based on neutropenia status 17(15%) patients were observed with neutropenia whereas 97(85%) patients were not observed with neutropenia (Figure 5)

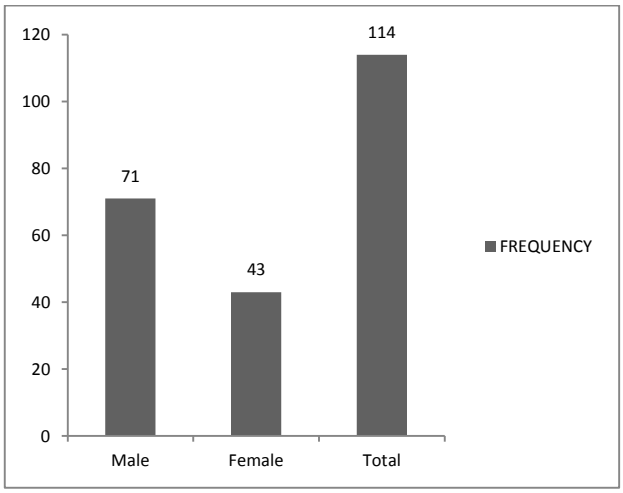

Figure 1: Gender wise distribution of patients

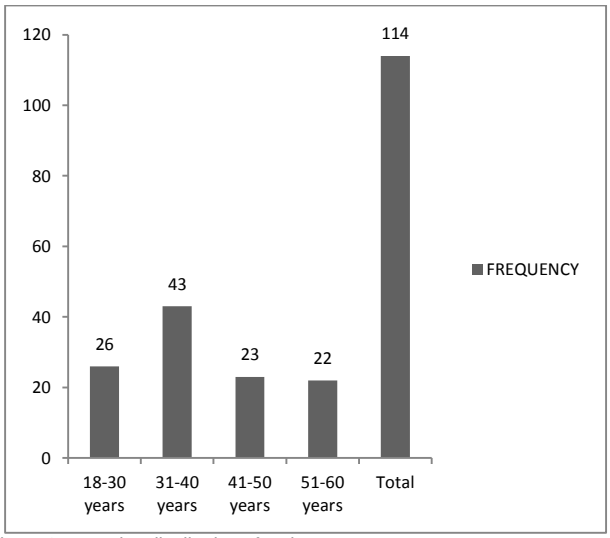

Figure 2: Age wise distribution of patients

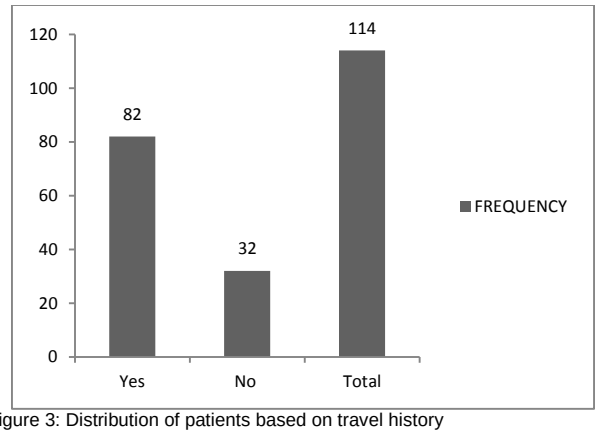

Figure 3: Distribution of patients based on travel history

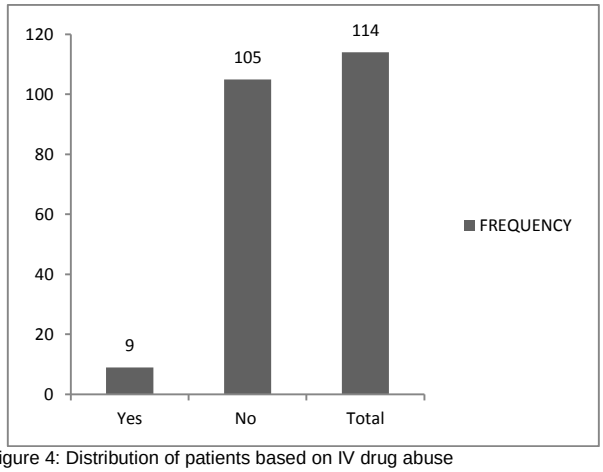

Figure 4: Distribution of patients based on IV drug abuse

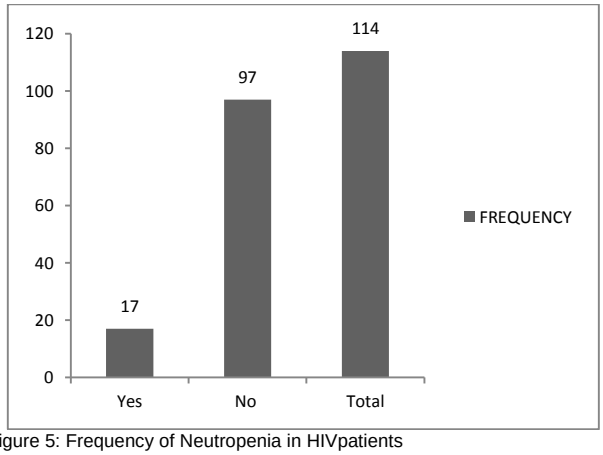

Figure 5: Frequency of Neutropenia in HIVpatients

DISCUSSION

HIV is the systemic illness known as acquired immune deficiency syndrome (AIDS). It is distinguished by significant dysfunction and increasing humoral and cellular defence response damage. HIV replicates in CD4+ lymphocytes, macrophages and dendritic cells[4]. This replication causes progression of disease which is distinguished by CD4+ T cells depletion. Amongst people infected by HIV, increased mortality is caused by opportunistic infections that are secondary to immune suppression. However anti-retroviral therapy (cART) in combination can be used for this progression [3].

In our study, totally 114 patients were included. There were 62% male patients and 38% female patients in our study. The Mean age (±SD) in our study was 32 (± 3.51). On the basis of age distribution, 23% patients were observed in 18-30 years age group, 38% patients were 31-40 years old, and 20% patients were 41-50 years old whereas 19% patients were observed in age range of 51-60 years. Based on travel history 72% patients were observed with positive history of traveling while 28% patients were observed with negative history of traveling. Based on IV drug abuse, 8% patients were observed with IV drug abuse whereas 92% patients were not observed with IV drug abuse. Based on neutropenia status 15% HIV patients were observed with neutropenia whereas 85% patients were not observed with neutropenia..

In accordance with our similar results were reported in previous study done by Chandrakar J et al in which, according to a survey conducted in India in 2015 the frequency of neutropenia in HIV infected patients10% [13].

Similar results were reported by Leroi C et al. in South West Africa in 2017 and they reported that neutropenia in HIV infected patients 11% at ART initiation [11].

Similar findings were reported in another previous study conducted by Bhowmik A et al. in which HIV infected children in West Bengal India in 2014 report neutropenia in 19% of children [12]. Another study carried out by Levine AM et al. also reported that neutropenia is common amongst individuals infected with HIV [14]. Another study carried out by Andersen CL et al. reported low frequency of neutropenia (1%), which is not in accordance with our study [15].

CONCLUSION

Our study concludes that the frequency of neutropenia was 15% in HIV patients in tertiary care hospital.

REFERENCES

1. Saha D, Kini JR, Subramaniam R. A study of the hematological profile of human immunodeficiency virus positive patients in coastal South Indian region. Journal of Medical Sciences. 2015;35(5):190.
2. Kumar D, Kumar D, Singh DK, Rai R. Prevalence of thrombocytopenia and its relation with WHO clinical and immunological staging among human immunodeficiency virus-infected children. Indian Journal of Child Health. 2014;1(3):140-2.
3. Pate KAM, Mankowski JL. HIV and SIV associated thrombocytopenia: an expanding role for platelets in the pathogenesis of HIV. Drug Discovery Today: Disease Mechanisms. 2011;8(1-2):e25-e32.
4. Munyazesa E, Emile I, Mutimura E, Hoover DR, Shi Q, McGinn AP, et al. Assessment of haematological parameters in HIV-infected and uninfected Rwandan women: a cross-sectional study. BMJ open. 2012;2(6):e001600.
5. Kyeyune R, Saathoff E, Ezeamama AE, Löscher T, Fawzi W, Guwatudde D. Prevalence and correlates of cytopenias in HIV-infected adults initiating highly active antiretroviral therapy in Uganda. BMC infectious diseases. 2014;14(1):496.
6. Opie J. Haematological complications of HIV infection. SAMJ: South African Medical Journal. 2012;102(6):465-8.
7. Choi SY, Kim I, Kim NJ, Lee S-A, Choi Y-A, Bae J-Y, et al. Hematological manifestations of human immunodeficiency virus infection and the effect of highly active anti-retroviral therapy on cytopenia. The Korean journal of hematology. 2011;46(4):253-7.
8. De Santis GC, Brunetta DM, Vilar FC, Brandao RA, de Albernaz Muniz RZ, de Lima GMN, et al. Hematological abnormalities in HIV-infected patients. International Journal of Infectious Diseases. 2011;15(12):e808-e11.
9. Shi X, Sims MD, Hanna MM, Xie M, Gulick PG, Zheng Y-H, et al. Neutropenia during HIV infection: adverse consequences and remedies. International reviews of immunology. 2014;33(6):511-36.
10. Chandrakar J, Siddiqui RP, Singh M. Haematological Profile of HIV Seropositive Patients in Relation to CD4 Lymphocyte Count. Journal of Evidence based Medicine and Healthcare. 2015;2(39):6399-405.
11. Leroi C, Balestre E, Messou E, Minga A, Sawadogo A, Drabo J, et al. Incidence of severe neutropenia in HIV-infected people starting antiretroviral therapy in West Africa. PLoS One. 2017;12(1):e0170753.
12. Bhowmik A, Banerjee P. Hematological manifestation in HIV infected children. J Coll Physicians Surg Pak. 2015;25(2):119-23.
13. Chandrakar J, Siddiqui R, Singh M. Haematological profile of HIV sero positive patients in relation to CD4+ lymphocyte count. J Evid based Med Healthc. 2015;2:6399-405.
14. Levine AM, Karim R, Mack W, Gravink DJ, Anastos K, Young M, et al. Neutropenia in human immunodeficiency virus infection: data from the women's interagency HIV study. Arch Intern Med. 2006;166(4):405-10.
15. Andersen C, Tesfa D, Siersma V, Sandholdt H, Hasselbalch H, Bjerrum O, et al. Prevalence and clinical significance of neutropenia discovered in routine complete blood cell counts: a longitudinal study. J Intern Med. 2016;279(6):566-75.