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A Descriptive Study of Cancer in Human Immunodefiency Virus Pataients in Tertiary Care Hospital

Dr. Arun Kumar[1], Dr. Om Prakash Shrivastava[2*]
[1]*Associate Professor, Department Of Radiotherapy, MahatmaGandhi Memorial Medical College, Jamshedpur, Jharkhand.*
[2*]*Associate Professor, Department Of Surgery, Mahatma Gandhi MemorialMedical College, Jamshedpur, Jharkhand.*
Corresponding Author: Dr. Om Prakash Shrivastava

Abstract
Introduction: *Human immunodeficiency virus (HIV) infection is a risk factor for cancer. HIV-associated cancers can be divided into acquired immune deficiency syndrome (AIDS)-defining cancers (ADC) and non-AIDS-defining cancers (NADC). The availability of effective antiretroviral therapy (ART) has lowered the incidence of cancer but there has been a simultaneous increase in the life expectancy of people living with HIV.*
Materials and Methods: *This is a Descriptive Study. Ethics committee approval is not routinely taken for retrospective studies at our institute. Study was conducted in the Department Of Radiotherapy, Mahatma Gandhi Memorial Medical College, Jamshedpur, Jharkhand. All diagnosed cases of malignancy at our institute undergo screening for HIV before starting treatment. All the patients with diagnosis of malignancy who were screened for HIV were included in the study from January 2015 to December 2018. A total of 10,934 patients were screened for HIV during this period. Among these all the HIV positive patients were reviewed in detail for demographics like age, sex and histological type of malignancy diagnosed. Patients with incomplete data were excluded from the study and a total of 189 patients were analysed.*
Results: *Among the study population of 10,934 patients, 2.3% werepositive for HIV (240/10, 934). The median age at presentation of malignancy in HIV positive patients in our study was 40 years for both male and female patients. There were more female HIV positive patients with cancer than men (61% versus 39%). Among the female HIV positive patients, the most common cancer was carcinoma cervix (64%) followed by breast cancer (12%) and anal/rectal cancer (10%). In HIV positive men with cancer, the most common site was head and neck cancer (36%) (HNNC) followed by Non-Hodgkin's Lymphoma (NHL) (16%), penile cancer (15%) and anal/rectal cancer (13%).*
Conclusion: *The NADCs are more common than ADCs among Indian HIV patients. Females who are HIV positive are more prone for malignancy than males. The common malignancies in Indian female HIV patients are carcinoma cervix and carcinoma breast. The male HIV patients with malignancy commonly have HNNC followed by NHL, carcinoma penis, rectum and anal cancer. Carcinoma penis is high in Indian HIV infected males. The spectrum of malignancies in HIV positive patients in our institute isdifferent from west,but comparable to other institutes in India.*
Key Words: *NADC, ADC, HIV, HNNC*

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I. Introduction

Human immunodeficiency virus (HIV) infection is a risk factor for cancer. HIV-associated cancers can be divided into acquired immune deficiency syndrome (AIDS)-defining cancers (ADC) and non-AIDS-defining cancers (NADC). The availability of effective antiretroviral therapy (ART) has lowered the incidence of cancer but there has been a simultaneous increase in the life expectancy of people living with HIV.[1] Consequently, the overall incidence of cancer and AIDS-defining cancer has stabilized over the last two decades (except invasive cervical cancer), while there has been an absolute increase in NADC. HIV-associated cancer is one of the leading causes of death in HIV patients.[2]

ADC include non-Hodgkin's lymphoma (NHL), invasive cervical carcinoma, and Kaposi's sarcoma (KS). NADC include lung cancer, anal cancer, Hodgkin's lymphoma, *etc.* The standardized incidence ratio (which compares the cancer rate in patients with HIV to the expected rate in the general population) varies from 2 in lung cancer to 498 in Kaposi's sarcoma. NHL remains the most common cancer in patients with HIV worldwide.[3]

Risk factors for cancer in HIV include immunosuppression, oncogenic potential of HIV, co-infection with other oncogenic virus such as hepatitis B and C, human herpes virus-8 (HHV-8) infection, human papilloma virus (HPV), Epstein-Barr virus (EBV), *etc.* HIV can also sensitize the cells to the oncogenic potential of tobacco, as suggested by an increase in the risk of lung cancer in people living with HIV (three times the general population) after adjustment for smoking status.[4]

In 2016, there were 36.7 million people living with HIV worldwide; 2.1 million of these lived in India. Based on regional records, NHL is the most common cancer overall and Kaposi's sarcoma is rare. Increasing access to ART is expected to decrease the overall incidence of cancer in this population, but the spectrum of cancer in people living with HIV in India needs to be better understood for effective screening.[5]

We aim to look at the prevalence and spectrum of cancer in HIV patients at a tertiary care referral center.

II. Materials And Methods

This is a Descriptive Study.Ethics committee approval is not routinely taken for retrospective studies at our institute. Study was conducted in the Department Of Radiotherapy, Mahatma Gandhi Medical College, Jamshedpur, Jharkhand. All diagnosed cases of malignancy at our institute undergo screening for HIV before starting treatment. All the patients with diagnosis of malignancy who were screened for HIV were included in the study from January 2015 to December 2018. A total of 10,934 patients were screened for HIV during this period. Among these all the HIV positive patients were reviewed in detail for demographics like age, sex and histological type of malignancy diagnosed. Patients with incomplete data were excluded from the study and a total of 189 patients were analysed.

III. Results

Among the study population of 10,934 patients, 2.3% werepositive for HIV (240/10,934). The median age at presentation of malignancy in HIV positive patients in our study was 40 years for both male and female patients. There were more female HIV positive patients with cancer than men (61% versus 39%). Among the female HIV positive patients, the most common cancer was carcinoma cervix (64%) followed by breast cancer (12%) and anal/rectal cancer (10%). In HIV positive men with cancer, the most common site was head and neck cancer (36%) (HNNC) followed by Non-Hodgkin's Lymphoma (NHL) (16%), penile cancer (15%) and anal/rectal cancer (13%). These results are summarized in Graph 1and Table 1.

Type of malignancy	Male N (%)	Female N (9%)	Overall N (%)
Cervix carcinoma	N/A	74 (64.34%)	74 (39.15%)
HNNC	27 (36.48%)	4 (3.47%)	30 (15.87%)
Breast carcinoma	0	14 (12.17%)	14 (7.4%)
Penile cancer	11 (14.86%)	N/A	11 (5.82%)
Anal canal carcinoma	4 (5.4%)	7 (6.08%)	11 (5.82%)
Rectal cancer	6 (8.1%)	5 (4.34%)	11 (5.82%)
NHL	12 (16.21%)	4 (3.47%)	16 (8.46%)
Thyroid	0	4 (3.47%)	4 (2.11%)
Other malignancies	14 (18.91%)	3 (2.6%)	18 (9.52%)
Total	74	115	189

Table 1: Showing Pattern of Malignancies in Male and Female Patients in the Study with 'n' representing the Number of Patients and Percentage of Patients (%) in Parenthesis. N/A is not applicable, HNNC= Head and Neck Cancer, NHL= Non-Hodgkin's Lymphoma

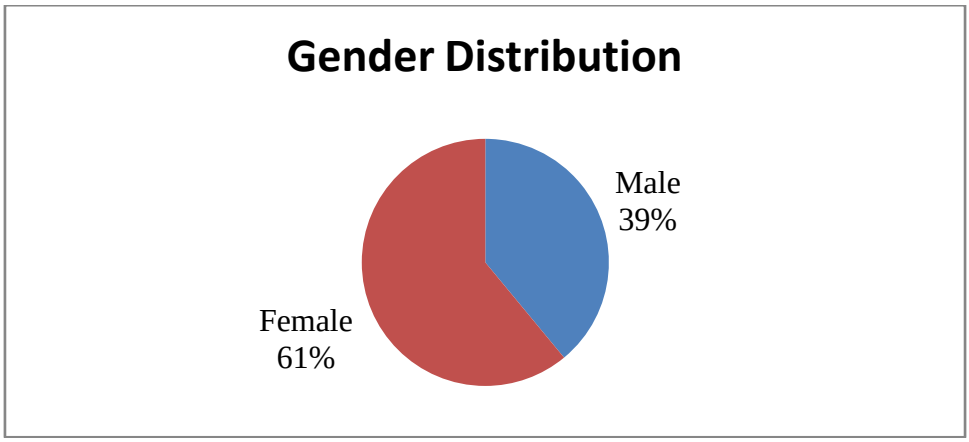

Figure 1: Showing the Gender of Patients with Malignancy and Human Immunodeficiency Virus Infection

IV. Discussion

About 93% of HIV/AIDS patients live in less developed countries including Africa, Asia including India and Latin America. The incidence of HIV and AIDS in India is high,but the literature on epidemiology of malignancies in HIV from India is sparse. The available literature on Indian patients is from small studies.[6]The incidence of malignancy in HIV patients is higher than general population,as they are more prone for maligancy. The spectrum of malignancies in our study is different from that noted in other studies, which were also single institute studies.[7]

Majority of the Indian patients with ADCs or NADCs were males6in previous studies,but in our study majority 61% of the patients were females (115/189). The ADCs were more common in a previous study7done on South Indian patients. But in our study, the ADCs were seen in 47.6% (90/189) and NADCs were seen in 52.38% (99/189) of patients.[8]

No case of Kaposi's sarcoma wasreported in our study and in the two previous studied from India.[9]In a study done on 77 HIV patients in South India,6themost common cancers in male HIV patients were NHL, oral cancers, lung cancer and soft tissue sarcoma,while the spectrum in our study was different. In our study,the most common malignancies in male HIV patients were HNNC followed by NHL, carcinoma penis, rectum and anal cancer.In previous studies, common cancers in female Indian HIV patients were NHL, breast and cervical cancer.6In our study in femaleHIV positive patients, the most common malignancy was carcinoma cervix followed by carcinoma breast and other cancers-HNNC, NHLandthyroid.According to literature available on males proportionate incidence rate (PIR) was increased for anal cancer, Hodgkin's disease, testicular cancer, colon cancer and some HNNC. Among females the PIRs were increased for cervical, vaginal and anal cancer. One study showed increased PIR in male HIV patients for penile carcinoma and for thyroid and pancreas carcinomas and AML in female HIV patients.6Most common malignancy in Indian HIV patients was NHL according to previous studies.

In our study,the most common malignancies in HIV positive patients were carcinoma cervix, HNNC, carcinoma breast, carcinoma penis and analcanal and rectum cancers. Other malignancies like testicular cancer, Hodgkin's lymphoma, vaginal cancer, pancreatic cancer and acute leukaemia were not seen in our study.[10]

The incidence of HNNC is higher among Indian population than west. This is due to the use of oral tobacco and betel nut and areca nut.Similarly,penile cancers are seen more frequently among Indian population than described in the west.The spectrum of cancers among Indian HIV patients include common malignancies or those related to HPV infection like that seen in the west. India is a diverse country with cultural variations among different states of India. The variations in the pattern and spectrum of malignancies in HIV positive Indian patients done at different institutes within India could be due to institutional and geographic variations. Hence, larger multi-institutional studies are needed to further evaluate the epidemiology of malignancies in HIV patients.[11]

V. Conclusion

The NADCs are more common than ADCs among Indian HIV patients. Females who are HIV positive are more prone for malignancy than males. The common malignancies in Indian female HIV patients are carcinoma cervix and carcinoma breast. The male HIV patients with malignancy commonly have HNNC followed by NHL, carcinoma penis, rectum and anal cancer. Carcinoma penis is high in Indian HIV infected

males. The spectrum of malignancies in HIV positive patients in our institute isdifferent from west,but comparable to other institutes in India.

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