

Original article:

## Retrospective analysis of epidemiological factors, pattern of care and oncology treatment outcome in Human Immunodeficiency Virus - positive cancer patients

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### ABSTRACT:

**Background:** The aim of the study was to retrospectively analyze the epidemiological factors, pattern of care and oncology treatment outcome in Human Immunodeficiency Virus-positive cancer patients (HIV-PCP).

**Material and Methods:** After an institutional ethics committee approval, hospital case record of HIV-PCP registered at the department of radiation oncology from January 2011 to December 2018 were retrospectively studied.

**Results:** Thirty-five HIV-PCP were registered at the department of radiation oncology during the study period. Median age at presentation was 43 years and 82.86% patients were  $\leq$  55 years of age. Female to male sex ratio was 4:1. Most common site of malignancy was female genital organs (65.71%) followed by hematolymphoid malignancy(11.43%). Majority of the patients presented in locally advanced stage (68.57%) of malignancy. The commonest histopathology type reported was squamous cell carcinoma in 80% of the cases. Only 48.57% patients completed the planned treatment; of which 52.94% patients had complete response.

**Conclusion:** HIV-PCP present at relatively early age and in advanced stage of malignancy. Majority of the patients either do not take or complete active oncology treatment.

**Key words:** Human Immunodeficiency Virus, cancer, pattern of care.

### Introduction:

India ranks third among the human immunodeficiency virus (HIV) infected people in the world.<sup>[1]</sup> Incidence of HIV infection is increasing and so as the number of HIV-positive cancer patients(HIV-PCP). The advances in the antiretroviral therapy (ART) and anticancer therapy had lead to the improvement in survival of the HIV-positive and cancer patients respectively.<sup>[2,3]</sup> But; the simultaneous treatment

of cancer and HIV-infection increases the morbidity.

HIV-positive patients are at increased risk of developing cancer.<sup>[4,5]</sup> Though the HIV defining malignancies are Kaposi's sarcoma, non-Hodgkin's lymphoma and cervical cancer;<sup>[6]</sup> HIV- positive patients are presenting with cancer of other sites as well specially in India.<sup>[7,8]</sup>

There are no specific consensus guidelines for the treatment of HIV-PCP because of the scarcity of data. Hence, this study was undertaken to find out different epidemiological factors, present pattern of oncology care and oncology treatment outcome in HIV-PCP. This will add on to the existing knowledge of pattern of malignancy and pattern of oncology care in HIV- positive patients.

**Materials and methods:**

This was a retrospective hospital record based study. The hospital case records of HIV-PCP registered at the department of radiation oncology from January 2011 to December 2018 were studied after an Institutional Ethics Committee approval. All demographic, disease and treatment details were filled in the patient record form. The response evaluation was done according to response evaluation criteria in solid tumors (RECIST- v1.1).<sup>[9]</sup> The clinical, laboratory, and radiological details available in the case record were used for the same.

**Statistical Analysis:**

The patient record forms were filled and data entry was done in Excel format. The statistical analysis was done using Excel spreadsheet.

**Results:**

Patients with histopathology proven malignant tumour and ELISA-positive HIV infection who were registered in the department of radiation oncology during the study period were included in the study. The case records of these 35 eligible patients were studied. The median age at presentation was 43 years with the youngest patient reported was nine years of age(range 09-77). Majority of the patients were below or equal to the age of 55years (82.86%). Female sex dominated the male. Duration of cancer symptoms was less than three months in 57.14% cases. Nineteen patients were already on ART at the time of diagnosis of cancer while 16 patients were diagnosed as HIV-positive during routine workup for malignancy. The characteristics of the study group are given in Table 1.

Table 1: Characteristics of study group (N=35)

Age in years Median (Minimum-maximum)	43 (09-77)
Age group <=55 years >55 years	29 (82.86%) 06 (17.14%)
Sex Male : Female	07:28 (20%:80%)
Addictions Not known Tobacco(Smokeless/smoked) +/- alcohol No addiction	12 (34.28%) 12 (34.28%) 11 (31.42%)
Co-morbidities Not known Present Absent	05 (14.28%) 04(hypertension) (11.43%) 26 (74.28%)
HIV diagnosis Newly diagnosed Old diagnosed cases on ART*	16 (45.71%) 19 (54.28%)
Pre treatment CD-4 count Not known	28 (80%)

>=200	05 (14.29%)
<200	02 (05.71%)
Duration of symptoms	
<= 3 months	20 (57.14%)
> 3 months	15 (42.86%)

\*ART- antiretroviral therapy

Gynecological malignancies (23 patients-65.71%) were the most common site of malignancy with cancer cervix contributing the most (22 patients) followed by hematolymphoid(11.43%) and head neck malignancy(8.57%). Histopathology subtype was squamous cell carcinoma in 80% of the patients. 68.57% patients were diagnosed with

locally advanced stage of malignancy despite short symptom duration in 57.14%. The stage grouping of two patients was not possible because of incomplete staging workup while two patients presented with metastatic stage of disease. Disease characteristics are described in Table 2.

Table 2: Disease Characteristics (N=35)

Site of malignancy	
Gynecological Ca* (Cervix + Endometrium)	23 (22+1) (65.71%)
Hematolymphoid malignancy(NHL**+CML***)	04 (3+1) (11.43%)
Head and Neck ca	03 (08.57%)
Gastrointestinal Ca (Anal canal)	02 (05.71%)
Breast	02 (05.71%)
Sarcoma	01 (2.86%)
Stage of malignancy	
Not known/Not applicable	02 (05.71%)
Early stage	07 (20%)
Locally advanced stage	24 (68.57%)
Metastatic stage	02 (05.71%)
Histopathology type	
Squamous carcinoma	28 (80%)
Adenocarcinoma	03 (08.57%)
Other	04(11.43%)

\*Ca- cancer,\*\* NHL- non Hodgkin's lymphoma, \*\*\*CML- chronic myeloid leukemia

Twenty-four patients were treated with curative intent. Thirteen patients received radical chemoradiation therapy (CIRT). Six patients received adjuvant CIRT or radiotherapy (RT). Two patients received chemotherapy (CT) alone. One patient was treated with RT alone, one with

surgery(Sx) alone and one with Sx followed by CT. Two patients were treated with palliative intent. Nine patients did not take any oncology treatment at our institution. Treatment alterations (as compared to HIV-negative patients) were done in 16 patients while

treatment alterations were not done in 10 patients. Seventeen out of 24 patients who were planned for curative treatment completed the planned treatment with 52.94% (9 patients) complete response rate. The treatment response

of 17 radically treated patients at first follow up is described in Table 3. The status at the time of last follow-up / hospital visit as recorded in case file of all 35 patients is given in Table 4.

Table 3: Treatment response according to Response Evaluation Criteria in Solid Tumors-1.1 (N=17)

Complete Response	09 (52.94%)
Partial Response	04 (23.53%)
Static disease	02(11.76%)
Progressive Disease	01 (5.88%)
Not known (defaulted after treatment completion)	01 (5.88%)

Table 4: Status at last follow up / last hospital visit (N=35)

Alive without disease	06 (17.14%)
Alive with disease	25 (71.43%)
Died of disease	03 (8.57%)
Died of other cause	01 (2.86%)

### Discussion:

Despite the advances in ART and cancer care, the management of HIV-PCP is a major challenge. HIV-PCP present at an early age and in advanced stage of disease.<sup>[10,11,12,13]</sup> Majority of our patients were below the age of 55 years(82.86%) and 68.57% patients had locally advanced malignancy at the time of diagnosis despite short symptom duration (less than/≈3 months) in 57.14% patients..

HIV defining malignancies are Kaposi's sarcoma, non-Hodgkin's lymphoma and cervical cancer.<sup>[6]</sup> In the western world; Kaposi's sarcoma and non-Hodgkin's lymphoma occurs at exceptionally high incidence.<sup>[4,5]</sup> In an Indian study by Dhir et al. no case of Kaposi's sarcoma was observed<sup>[7]</sup> while a review by Biggar et al. reported a single case of Kaposi's sarcoma in Indian HIV- positive patient.<sup>[8]</sup> The increased proportion of non-Hodgkin's lymphoma is reported in Indian HIV-PCP.<sup>[7,8,14,15,16]</sup> Gynecological malignancies was the commonest site of malignancy in our study with cervix being the commonest sub-site. This can be

because of the female preponderance in our study subjects. Hematolymphoid malignancies were the second common site of malignancy with three male patients of non-Hodgkin's lymphoma. Thus, HIV-defining malignancies i.e. cancer cervix and non-Hodgkin's lymphoma were common in our study subjects.

The documented response to oncology treatment is poor in HIV-PCP as compared to HIV-negative patients.<sup>[10,11,13]</sup> Twenty-six patients were planned for the oncology treatment; among which treatment alterations were done in 61.53% patients. Only 17 patients in the present study completed the planned treatment; of which 52.94% had complete response to treatment. The treatment response is correlated with pre-treatment CD-4 count. CD-4 count of less than 200 is associated with poor treatment outcome<sup>[16,17]</sup> Venkatesh et al. observed that HIV infected patients who develop cancer had more advanced immunodeficiency and significantly low CD-4 counts at the time of cancer diagnosis as compared to HIV-positive patients who do not develop cancer.<sup>[16]</sup> The compromised CD-4

counts together with an advanced stage of cancer may limit the delivery of curative treatment.

#### **Conclusion:**

HIV-PCP present at relatively early age and in advanced stage of malignancy. It is more common in females with cervix as a leading site of cancer. Majority of the patients either do not take or complete active oncology treatment. The reasons behind the poor patient compliance and treatment outcome need to be evaluated further.

**Recommendations:** Oncology treatment should be tailored as per patient's CD-4 counts and measures should be taken to increase the treatment compliance.

**Study limitations:** The short comings of this study were few. Firstly, it was a retrospective study. Secondly, the record of CD-4 counts and toxicity assessment was not available at length. Third and important limitation was the relatively less number of patients to reach a statistically significant conclusion.

#### **References:**

1. HIV AIDS in India. <http://www.worldbank.org/news/2017/07/10>. Accessed on 28<sup>th</sup> September 2019.
2. National AIDS Control Organization. Annual report 2016-2017. Chapter 24. Page 339. <https://www.naco.gov.in/sites/default/files/Naco%20ANNUAL%20REPORT%202016-17.pdf>. Accessed on 24<sup>th</sup> October 2019.
3. Pignon JP, Domenge L. Chemotherapy added to locoregional treatment for head and neck squamous cell carcinoma: Three metanalysis of updated individual data: MACH-NC Collaborative Group: Meta-analysis of chemotherapy on head and neck cancer. *Lancet* 2000;355:949-55.
4. Frisch M, Biggar RJ, Engels EA, Goedert JJ. AIDS-cancer match registry study group. Association of cancer with AIDS-related immunosuppression in adults. *JAMA* 2001;285:1736-45
5. Serraino D, Piselli P, Busnach G, for the immunosuppression and cancer study group, et al. Risk of cancer following immunosuppression in organ transplant recipients and HIV-positive individuals in southern Europe. *Eur J Cancer* 2007;43:2117-23.
6. HIV defining malignancies. <http://www.cancer.gov/hiv-fact-sheet>. Accessed on 28<sup>th</sup> September 2019.
7. Miss Pratibha M Karandikar , Dr Motilal C Tayade , Dr Rahul Kunkolol , Three-dimensional (3D) Printing applications in Healthcare sector in India , *Pravara Med Rev*; March 2020, 12(01) , 51-56
8. Bigger RJ, Chaturvedi AK, Bhatia K, Mbulaiteye SM. Cancer risk in persons with HIV/AIDS in India: a review and future directions for research. *Infectious Agents and Cancer* 2009;4(1):4.
9. Dr. Madhur Gupta, Dr. Arti Ajay Kasulkar, Health-seeking behavioral intentions and prevention practices of medical undergraduates during COVID-19 lockdown period , *Pravara Med Rev*; December 2020, 12(04) , 4 - 10
10. Berretta M, Cappellani A, Di Benedetto F, Lleshi A, Talamini R, Canzonieri V, et al. Clinical presentation and outcome of colorectal cancer in HIV-positive patients: A clinical case-control study. *Onkologie* 2009;32:319-24.
11. Simonds HM, Neugut AI, Jacobson JS. HIV status and acute haematological toxicity among patients with cervix cancer undergoing radical chemoradiation. *Int J Gynecol Cancer*.2015;25(5):884-890.
12. Srivastava SK, Engineer R, Rajadhyaksha S, Dinshaw KA. HIV infection and invasive cervical cancer, treatment with radiation therapy: toxicity and outcome. *Radiother Oncol*.2005;74:31-35.
13. Kim JH, Sarani B, Orkin BA, Young HA, White J, Tannebaum I, et al. HIV-positive patients with anal carcinoma have poorer treatment tolerance and outcome than HIV-negative patients. *Dis Colon Rectum* 2001;44(10):1496-1502.
14. Dr Rajvir Bhalwar, Lock-down for COVID-19 in India: An alternative viewpoint and revised epidemiological estimates , *Pravara Med Rev*; June 2020, 12(02) , 4 - 10
15. Sinha S, Agarwal A, Gupta K, Mandal D, Jain M, Detel SR, et al. Prevalence of HIV in patients with malignancy and of malignancy in HIV patients in a tertiary care center from north India. *Current HIV Research* 2018;16(4):315-20.
16. Venkatesh KK, Saghayam S, Devaleenal B, Poongulali S, Flanigan TP, Mayer KH, Kumaesamy N. Spectrum of malignancies among HIV-infected patients in south India. *Indian J Cancer* 2012;49(11):176-80.
17. Welton L, Klencke B, Weinberg V, Krieg R. The significance of pre treatment CD4 count on the outcome and treatment tolerance of HIV positive patients with anal cancer. *Int Jr Radiat Oncol Biol Phys* 1999;44(1):127-31.

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