Cancers in people living with HIV: an observational study in the cohort of Modena over 27 years.

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BACKGROUND

Nowadays, thanks to antiretroviral therapy (ART), life expectancy of people living with HIV (PLWH) is similar to the general population. Simultaneously, prevalence of comorbidities increased, including neoplastic diseases, one of the main causes of death and more frequent in PLWH due to immunosuppression and inflammatory state.

The aim of the study was to describe cancer prevalence, deaths and 5-yearsurvival in PLWH in our center.

MATERIAL AND METHODS

- We retrospectively included all PLWH at Modena Clinic who developed cancer from 1996 to 2023, excluding those diagnosed with cancer prior to acquiring HIV.
- We analyzed demographic, survival characteristics, and tumor types, examining the frequency of cancer diagnosis over time.
- Following descriptive analysis, logistic regression was done to identify factors contributing to death and 5-year survival.

RESULTS

Descriptive analysis

During the study period a total of 258 people developed 309 tumors.
Tables 1 and 2 describe cohort characteristics. The most frequently observed cancers were hematologic malignancies (17.9%), KS (15.3%), and genitourinary tract tumors (14.9%).
Ninety-one deaths occurred (35.3%), predominantly due to cancer (80.2%). Among 309 total diagnosed tumors, 36% were AIDS-defining cancers (ADM), and 64% were non-AIDS-defining cancers (NADM).

Table 1. Cohort characteristics

Characteristics	Total (258)
Sex, male, n (%)	185 (71.5)
Age at cancer, median (IQR)	54 (43-60)
Years of HIV infection before cancer, median (IQR)	14 (3-25)
Risk factors for HIV, n (%)	
Men who have sex with Men	66 (25.8)
Risky sexual intercourse	83 (32.4)
Intra venous drug users	68 (26.6)
Vertical trasmission	2 (0.8)
No data	12 (4.0)
HIV VL undetectable at cancer diagnosis, n (%)	236 (81.0)
CD4 value, median (IQR)	399 (2.04 -6.31)
CD4/CD8 ratio, median (IQR)	0.53 (0.29-0.96)
AIDS, n (%)	134 (51.9)
PJP	12 (9.0)
NHL	25 (18.7)
KS	42 (31.3)
Cancer type, n (%)	
ADM	109 (36.0)
NADM	200 (64.0)

Figure 1. Causes of death

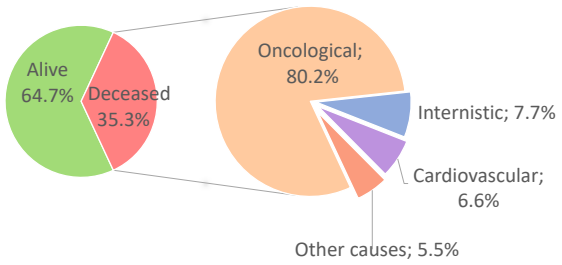

Figure 2. Cancer type

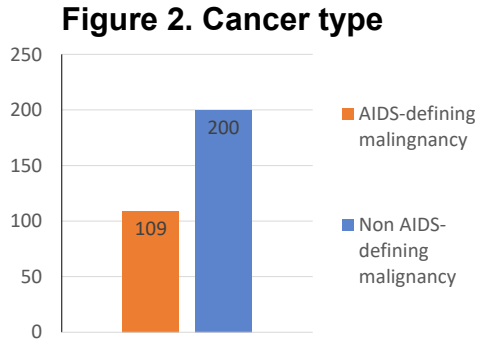

Figure 3. Cancer annual incidence

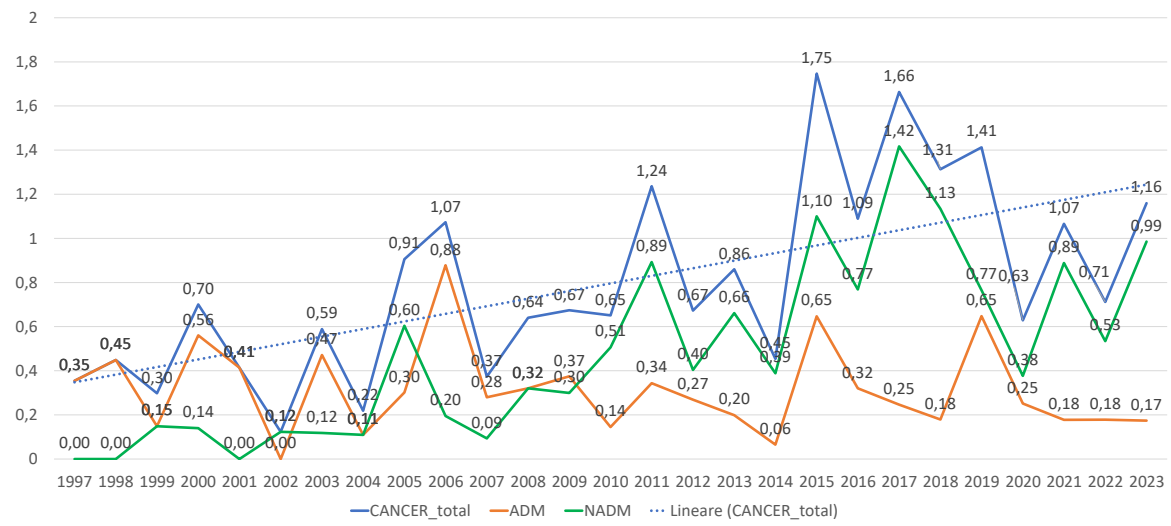

Table 2. Sex distribution of cancer diagnosis

Cancer diagnosis	Woman 90 (100)	Man 217 (100)	All 307 (100)	*P value*
Haematologic, n(%)	16 (17.8)	39 (18)	55 (17.9)	0.968
Gastrointestinal, n(%)	5 (5.6)	16 (7.4)	21 (6.8)	0.566
HPV, n(%)	18 (20)	18 (8.3)	36 (11.7)	0.004
Head-Neck, n(%)	6 (6.7)	11 (5.1)	17 (5.5)	0.577
Liver, n(%)	2 (2.2)	11 (5.1)	13 (4.2)	0.259
Lung, n(%)	3 (3.3)	17 (7.8)	20 (6.5)	0.146
Genitourinary, n(%)	9 (10)	37 (17.1)	46 (14.9)	0.115
Breast, n(%)	18 (20)	0 (0)	18 (5.9)	0.000
Bone, n(%)	1 (1.1)	0 (0)	1 (0.3)	0.120
Other, n(%)	6 (6.7)	20 (9.2)	26 (8.5)	0.465
Metastasis, n(%)	2 (2.2)	5 (2.3)	7 (2.3)	0.965
Kaposi's sarcoma, n(%)	4 (4.4)	43 (19.8)	47 (15.3)	0.001

Logistic regression analysis

Table 3 outlines the primary risk factors influencing mortality and 5-year survival: individuals with AIDS diagnosis had elevated mortality risk (p=0.009), while those with undetectable HIV-RNA at cancer diagnosis showed improved 5-year survival (p=0.051).
Lung cancer carried the highest mortality risk (p=0.012) whereas HPV-related cancers presented the lowest risk (p=0.004). The type of antiretroviral regimen administered at cancer diagnosis did not impact outcomes.

	OUTCOME: DEATH (225 obs)			OUTCOME: ALIVE AT 5 YEARS (219 obs)		
	OR	95%CI	p-value	OR	95%CI	p-value
AIDS	3.42	1.36-8.62	0.009	1.32	0.45-3.86	0.613
Years of HIV	1.06	1.01-1.10	0.009	0.92	0.88-0.97	0.002
Undetectable HIV RNA at cancer	0.41	0.16-1.05	0.061	3.48	0.97-12. 5	0.051
CD4/CD8 ratio at cancer	1.22	0.55-2.70	0.626	1.60	0.62-4.08	0.334
ARV at cancer						
INSTI_based	0.51	0.07-3.88	0.518	0.30	0.04-2.49	0.266
PI_based	0.51	0.61-4.12	0.524	0.62	0.07-5.22	0.661
NNRTI_based	0.67	0.08-5.56	0.707	0.42	0.05-3.64	0.431
Cancer						
Kaposi Sarcoma	0.50	0.14-1.82	0.091	0.57	0.12-2.77	0.488
Gastro-intestinal	2.75	0.57-13.2	0.234	1.55	0.23-10.6	0.653
HPV related	0.18	0.04-0.81	0.004	4.28	0.86-21.3	0.076
Head and neck	0.63	0.12-3.30	0.284	9.97	1.15-86.8	0.037
Liver	0.77	0.09-6.86	0.223	2.75	0.25-32.3	0.420
Lung	28.1	2.11-374.1	0.012	0.06	0.01-0.81	0.035
Genito-urinary	0.81	0.21-3.03	0.749	1.69	0.32-8.98	0.540
Breast	0.65	0.13-3.23	0.600	3.61	0.43-30.7	0.239
Bone	-	-	-	-	-	-
Other	1.23	0.26-5.82	0.790	3.89	0.69-21.7	0.121
Metastasis	1.49	0.15-15.1	0.733	-	-	-
Year of cancer diagnosis	1.01	0.92-1.08	0.975	0.70	0.62-0.80	<0.001
Age at cancer diagnosis	1.03	0.99-1.06	0.162	0.99	0.96-1.03	0.824
Metastasis	6.50	2.99-14.1	0.001	0.25	0.09-0.65	0.005

CONCLUSIONS

- Consistent with the literature, our cohort observed and increasing incidence of cancer in PLWH over time, with a rise in NADM compared to ADM.
- These findings underscore the importance of implementing strategies to prevent cancer onset and enable early diagnosis.

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