

# Change in pattern of secondary malignancies following Kaposi's Sarcoma in the era of Anti-Retroviral Therapy

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## Background

- ❖ Kaposi sarcoma (KS) is a tumor that is associated with immune suppression
- ❖ Classical KS is found in elderly people
- ❖ AIDS-associated KS is found in people with AIDS
- ❖ Prior to AIDS therapy, people with KS had higher risk of secondary tumors.
- ❖ Demographics of individuals with KS and HIV/AIDS have changed significantly.
- ❖ It is possible that the tumors which develop after KS have changed as well.

## Objective

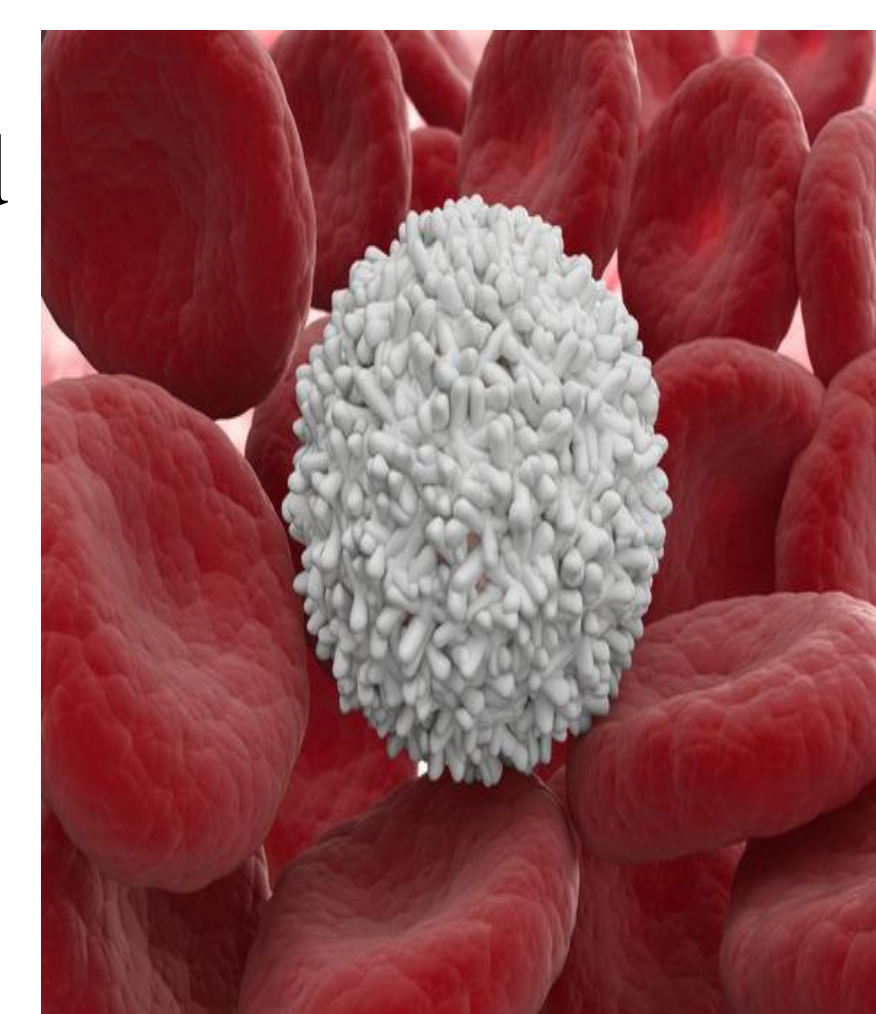
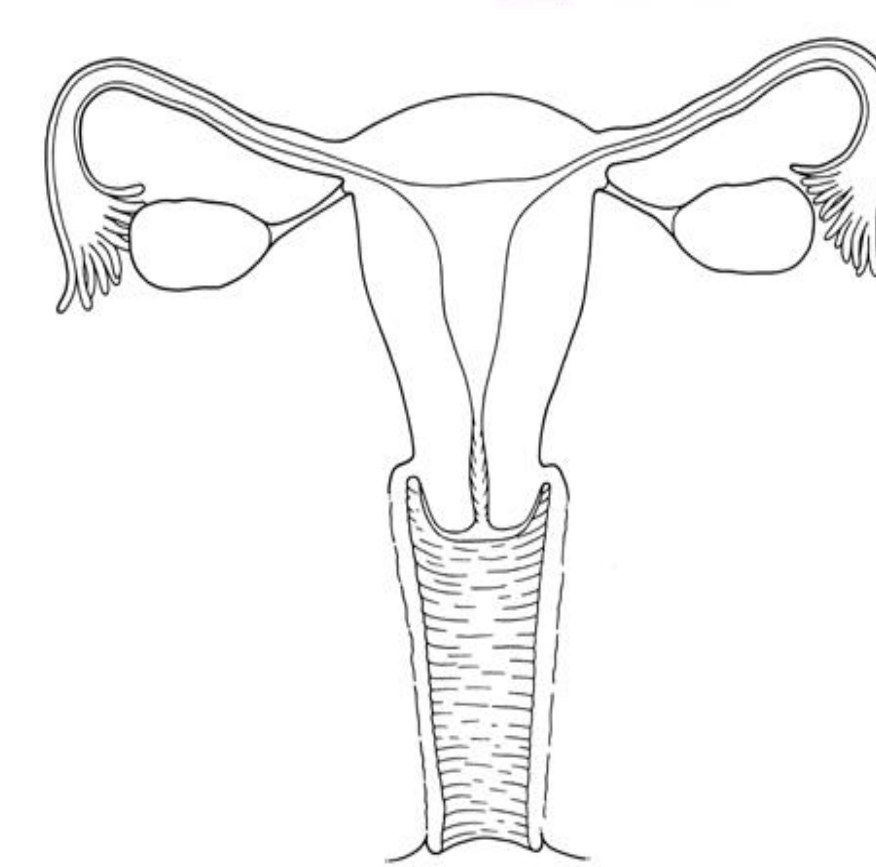
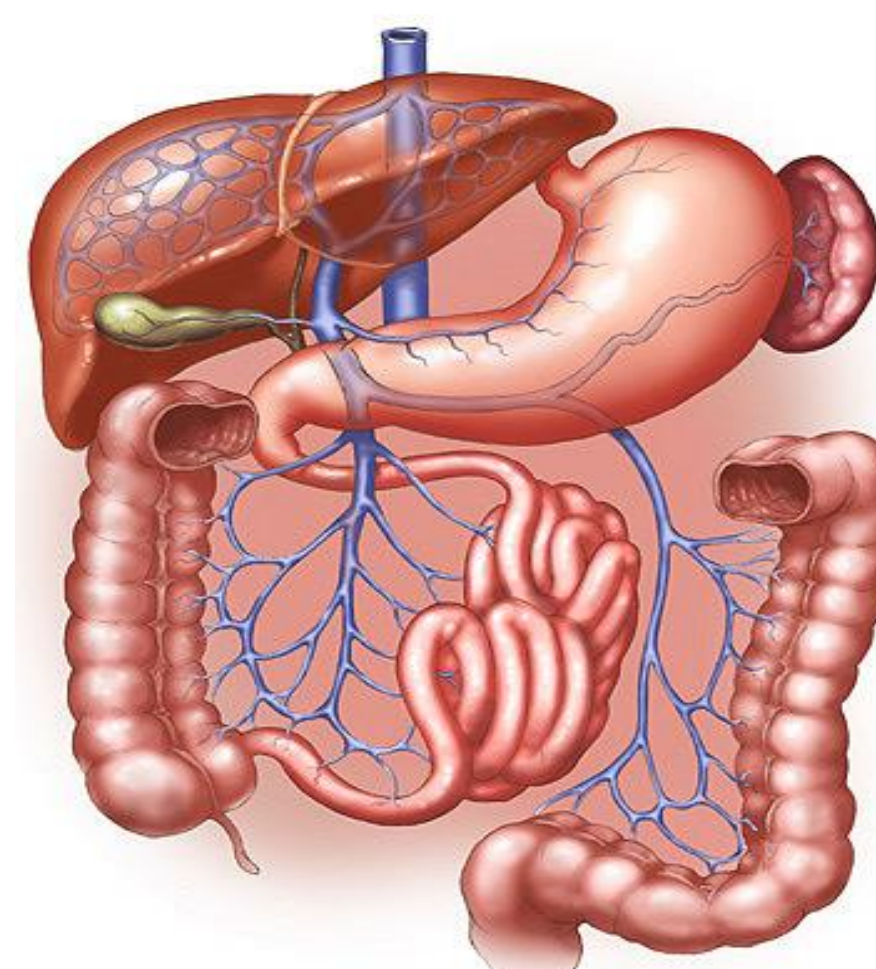
The aim of this study is to determine the risk of secondary tumors in people with KS in different time periods from 1980 to 2013 using the Surveillance Epidemiology and End-Result Survey Program (SEER) data.

## Methods

- ❖ Participants were cases with KS diagnosed as the first tumor
- ❖ Participants were followed up for development of secondary tumor
- ❖ Primary outcome was any secondary tumor other than KS.
- ❖ Standardized incidence ratios (SIR) and 95% confidence intervals were calculated
- ❖ Analysis was stratified into 2 time periods
  - ❖ Pre-HAART era (1980-1995)
  - ❖ HAART era (1996-2013)
- ❖ Cases in the HAART era were additionally stratified by age, HIV/AIDS region, latent time between KS and secondary tumor.

## Results

Secondary cancers following Kaposi Sarcoma By time periods.					
1980-1995			1996-2013		
	O	SIR (95% CI)		O	SIR (95% CI)
All Sites	782	3.36 (3.13-3.60)	All sites	267	1.94 (1.71-2.19)
Rectal Tumor	11	2.01 (1.00-3.60)	Tongue	9	6.99 (3.20-13.27)
Anal cancer	30	49.70 (33.53-70.94)	Anal cancer	32	59.24 (40.52-83.63)
Liver	15	4.98 (2.79-8.22)	Liver	9	3.33 (1.52-6.31)
Cervix	3	13.70 (2.82-40.03)	Penis	2	10.28 (1.24-37.13)
Hodgkin's Lymphoma	8	6.40 (2.76-12.60)	Hodgkin's Lymphoma	8	10.70 (4.62-21.09)
Non-Hodgkin's Lymphoma	520	48.97 (44.85-53.36)	Non-Hodgkin's Lymphoma	88	13.14 (10.54-16.19)
			Acute Lymphocytic Leukemia	3	17.62 (3.63-51.49)



## Standardized incidence ratios for Kaposi Sarcoma diagnosed from 1996 to 2013 stratified by age, registry and Follow up period

	Age				HIV/AIDS region				Follow up period							
	<65		65+		Low		High		<1		1-5		5-10		>10	
	O	SIR	O	SIR	O	SIR	O	SIR	O	SIR	O	SIR	O	SIR	O	SIR
Tongue	9	8.85 (4.05-16.80)	0	0.00	1	3.11 (0.08-17.35)	8	8.28 (3.57-16.31)	0	0.00	5	11.18 (3.63-26.10)	2	4.97 (0.60-17.94)	2	6.16 (0.75-22.26)
Anal Cancer	32	77.52 (53.03-109.44)	0	0.00	7	58.87 (23.67-121.30)	25	59.35 (38.41-87.61)	2	37.04 (4.49-133.82)	10	49.35 (23.67-90.77)	15	88.38 (49.46-145.76)	5	43.93 (14.26-102.51)
Liver	8	3.89 (1.68-7.66)	1	1.54 (0.04-8.58)	1	1.48 (0.04-8.25)	8	3.94 (1.70-7.76)	2	8.68 (1.05-31.37)	0	0.00	3	3.63 (0.75-10.62)	4	5.42 (1.48-13.88)
Penis	2	19.48 (2.36-70.36)	0	0.00	0	0.00	2	13.36 (1.62-48.27)	0	0.00	0	0.00	2	33.51 (4.06-121.04)	0	0.00
HL	7	10.91 (4.39-22.47)	1	9.47 (0.24-52.79)	0	0.00	8	13.91 (1.38-304.51)	0	0.00	5	15.79 (5.13-36.84)	2	9.19 (1.11-33.19)	1	8.61 (0.22-47.96)
NHL	81	20.54 (16.31-25.53)	7	2.54 (1.02-5.24)	24	14.92 (9.56-22.20)	64	12.58 (9.69-16.06)	31	41.88 (28.45-59.44)	39	14.42 (10.25-19.71)	13	6.48 (3.45-11.08)	5	4.02 (1.30-9.37)
ALL	2	14.94 (1.81-53.98)	1	27.45 (0.69-152.93)	0	0.00	3	23.36 (4.82-68.28)	0	0.00	2	29.06 (3.52-104.00)	0	0.00	1	31.54 (0.80-175.72)

## Interpretation/Conclusion

- ❖ Overall risk of secondary tumors following KS has decreased from the Pre-HAART to the HAART era
- ❖ Cervical cancer and colon cancer risk are less common in the HAART era
- ❖ Tongue, penile and Acute lymphocytic leukemia are more common in the HAART era.
- ❖ Risk appears to be higher for those less than 65 living in high HIV/AIDS region.
- ❖ HIV/AIDS and KS may be interacting to increase the risk of secondary tumors.
- ❖ Long term active surveillance of these tumors in people with KS and HIV/AIDS may be a good preventive strategy

