Genito-urinary cancer in Saudi Arabia

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ABSTRACT

The incidence of Genito-urinary cancer (GUC) in the Kingdom of Saudi Arabia (KSA) increases with age and is 5-fold higher in men than in women. Genito-urinary cancer accounts for only 9.2% of all cancers in KSA, while the rate in the United States of America (USA) is as high as 24.1%. An epidemiological search on GUC in KSA revealed a relatively low incidence compared to developed countries. This is more evident in prostatic cancer, which is 50 times lower than in the USA. The most common GUC in KSA is bladder, followed by the prostate, kidney, and testicular cancer. Penile cancer is extremely rare. Genito-urinary cancer is not among the 10 most common cancer in KSA, however, bladder cancer ranking tenth. Reviewing the National Cancer Registry data in addition to the available literature on GUC in KSA for the past 50-years showed the changing pattern of this disease over time.

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Since the establishment of the National Cancer Registry (NCR) in the Kingdom of Saudi Arabia (KSA) in 1992 and its first report in 1994, we have been getting more accurate data on cancer epidemiology in this country. The Kingdom of Saudi Arabia is a large country with various climatic, topographic and environmental conditions and special social and genetic pattern in its different regions. Also, as KSA is a rapidly changing country in different aspects of agriculture, industry, education, health, etc., some changes in trends of the type of cancer are expected. The frequency and distribution of cancer in this country is therefore of great interest. It is also known that the population of KSA is a young population. Half of the population is under 15-years-old, and those above the age of 65-years is only 2.6%.[1]

In a recent NCR report, the annual frequency of cancer cases in KSA is approximately 5460, which represent 364 cancers per million per year and with an age standardized rate (ASR) of 62.6/100000. The male to female ratio is 1.1:1 and the average age of cancer patients for male is 52-years and for female 47-years. It is of interest to note that 10% of the cancers occur in patients below 14-years of age, while 41% are seen in patients above the age of 60-years.[2,3]

Genito-urinary cancer. (GUC) Data from NCR indicated that the GUC accounted for 9.2% of all cancer cases in KSA with a male to female ratio of 4.4:1 and ASR of 7.8/100000. The most common GUC is bladder cancer followed by prostate, kidney and testis.[3] The penile cancer is as expected extremely rare in view of the traditional male circumcision. There is, nevertheless, rare occurrence of scarred penile shaft cancer following extensive pubic circumcision.[4] The only GUC appeared among the 10 most common cancers is the bladder cancer, which ranks tenth. In the United States of America (USA), prostate cancer as well as bladder and kidney cancers are on the top of the list as shown in **Table 1**. The incidence of GUC in KSA is relatively low compared to the incidence in developed countries, especially the low incidence of prostate cancer which is 50 times lower than in the USA **(Table 2)**.

Prior to the establishment of the National Cancer Registry in 1992, all cancer information in this country was based on hospital data. This could be used to reflect cancer patterns in KSA. The first attempt to assess the distribution of cancer in KSA was reported by Taylor.[5] With a total cancer of 264 seen over 11-years (1950 through to 1961) in the only existing hospital in the country at that time

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Table 1 - The 10 most common cancers.

Kingdom of Saudi Arabia NCR 2000	United States of America ACS 2003
Breast	Prostate
Lymphoma	Breast
Leukemia	Lung
Colo-rectal	Colo-rectal
Liver	Lymphoma
Thyroid	Skin
Central nervous system	Bladder
Lung	Uterus
Hodgkin's disease	Kidney
Bladder	Pancreas

NCR - National Cancer Registry, ACS - American Cancer Society

Table 2 - Genito-urinary incidence.

GUC	Kingdom of Saudi Arabia NCR 2000		United States of America ACS 2003	
	%	ASR	%	ASR
Bladder	3.4	2.4	4.3	13.8
Prostate	2.7	3.5	16.5	163.5
Kidney	2.5	1.6	2.4	9.3
Testis	0.6	0.3	0.6	2.9
All GUC	9	7.8	24.1	189.6

NCR - National Cancer Registry, ACS - American Cancer Society
GUC - genito-urinary cancer, ASR - age standardized rate

(Aramco Medical Services), GUC was 5.7% of all cancer cases. Renal cancer was the most common GUC, followed by bladder, prostate and testis. No report of any penile cancer. None of the GUC was among the 10 most common cancer in this study. It is worth to mention that life expectancy at that time was 39-years and 15% of cancer cases were seen in patients below 20-years of age, while cancer cases over 60-years was only 8%. Male predominance ratio was noted (2.7:1). Another study carried out from the same hospital 25-years later showed a big change in the pattern of cancer in that Eastern region.[6] The number of cancer reported were 428 in 5-years (1981 through to 1985) with a male to female ratio of 1.3:1 and the GUC account for 9.8% of all cancer cases. Prostate cancer appeared for the first time among the 10 most common cancers ranking the 9th with an incidence of 4.2% and ranks fifth in males with an incidence of 7.5%. Bladder cancer also ranks fifth in male with 3% incidence rate. Unfortunately, this study failed to document the age of cancer cases, so a comparison with Taylor's study in this regard is not possible.

The first report of cancer cases from the Western region of KSA was published in 1979 by Stirling et al.[7] It covers the period 1975 through to 1977 and reporting on 1000 cancer cases from Bab-Sharif Hospital, Jeddah, KSA. The frequency of GUC was 5.1% and none of GUC was among the 10 most common cancer. The most common GUC cancer was bladder 2.4%, followed by testis 1.3%, and then 0.7% for both prostate and kidney cancers. The study was lacking data on age and sex of cancer distribution.

Reports from Central KSA started to be published by Amer,[8] El-Akkad,[9] but GUC were not defined separately due to a low frequency of 6%. Koreich and Al-Kuhaymi[10] reported 297 cancer patients seen over a 3-year period (1981 through to 1982), with male to female ratio of 1.4:1 and peak age of all cancer cases of 50-60 years. Ten percent of cases were below the age of 20-years and 44% above the age of 60-years. The frequency of GUC was 6%. None of the GUC were among the 10 most common cancers. The most common GUC was bladder, followed by testis, kidney and prostate. Again, no single report on penile cancer.[10] Other published reports from the Central region by El-Akkad,[11] Mahboubi,[12] Sebai,[13] Koreich-Kuhaymi[14] and Ezzat et al[15] and Ajarim[16] showed the same pattern of GUC as described in the aforementioned papers. A very interesting cancer data has been reported from Al-Baha region covering the period from 1981 through to 1987 with 582 cancer cases.[17] The male to female ratio was 1.4:1 and average age of 54-years for male and 50-years for female. The frequency of GUC among all cancer cases was 10.1% higher compared to other regions. Bladder cancer ranked fifth among all cancers and among males. The authors wondering with regards to the law incidence of prostate cancer ranked only ninth among males in spite of the total number of prostatic biopsies carried out. They also reported a low incidence of squamous cell carcinoma of the bladder in spite of severe infestation of schistosomiasis. It was also noted from this study that there was no report of testicular or penile cancer, while renal cancer was found in 1.9%. The first cancer report from Asir region was published in 1991 with 697 cancers during the period from 1987 through to 1989.[18] Asir region is also an endemic region with schistosomiasis as the case in Al-Baha and Gizan. Bladder cancer ranked sixth among all cancer cases and fourth among males with a frequency of 6.4% and 9.4%. Prostate cancer has only a frequency of 1.4%, but ranked tenth among males.

In Gizan, one of the Southern regions in the Kingdom (Al-Baha, Asir), Tandon et al[19] published in 1995 their experience on 1787 cases of cancer seen during the period 1982 through to 1992. They estimated a cancer frequency of 397 new

Table 3 - Regional Genito-urinary cancer in the most populated regions representing 76% of all cancers (National Cancer Registry Data 1994-1998).

Region	n of cancer cases	ASR	GUC (%)	Bladder (%)	Prostate (%)	Kidney (%)	Testis (%)
Riyadh	1610 (30)	109	8.7	2.8	3.0	2.2	0.6
Makkah	1300 (24)	55	8.8	3.9	2.2	2.2	0.5
Eastern	892 (16)	80	12.2	4.2	4.2	3	0.7
Asir	341 (6)	26	9.3	4.1	2.4	1.6	0.6

NCR - National Cancer Registry, ASR - age standardized rate, GUC - genito-urinary cancer

Table 4 - Incidence of genito-urinary in the literature over a period of 50-years.

Years covered	Authors	n of cancer	GUC %	Bladder %	Prostate %	Kidney %	Testis %	GUC among 10 most common
1950-1961	Taylor[5] 1963	264	5.7	1.5	1.5	2.3	0.4	None
1975-1977	Stirling[7] 1979	1000	5.1	2.4	0.7	0.7	1.3	None
1981-1982	Koreich[10] 1984	297	6	2.3	0.3	0.6	1.7	None
1975-1985	Mahboubi[12] 1987	11204	6	2.5	1	1.7	0.8	None
1981-1985	Rabadi[6] 1987	428	9.8	2.3	4.2	2.3	0.7	Prostate ranks 9th
1981-1987	Will'en[17] 1989	582	10.1	5.8	2.4	1.9	-	Bladder ranks 5th
1982-1992	Tandon[19] 1995	1787	11.2	6.9	2.5	0.9	0.3	Bladder rank 5 prostate rank 9
1978-1988	Al Tamimi[23] 1997	1152	12	6.7	3.8	1.1	0.4	None
1994-2000	National Cancer Registry[2,3]	5459 per year	9.2	3.4	2.7	2.5	0.3	Bladder ranks 10th

GUC - genito-urinary cancer

Table 5 - Genito-urinary cancer distribution in hospital based and National Cancer Registry Data.

	Koreich[24] 1992	Shetty[25] 1993	Abomelha[26] 1998	NCR[3] 2000
n of reported cases	412	100	508	5459 per year
% of GUC cancer	(7.5)	(7)	(9.2)	(9.2)
Male to female ratio	5:1	5:1	5:1	4.4:1
Bladder cancer %	(37.9)	(50)	(49.6)	(37)
Prostate cancer %	(20.9)	(20)	(20.4)	(29)
Kidney cancer %	(17)	(16)	(21.6)	(27)
Testicular cancer %	(12)	(7)	(6.4)	(7)

NCR - National Cancer Registry

cases/million/year, which was approximately the figure of NCR (364/million/year). The frequency of GUC in Saudi patients was 11.2%, one of the highest in the country, with bladder and prostate cancer among the 10 most common cancers ranking fifth and ninth. The most common GUC cancer was bladder followed by prostate, kidney, penile, and testis. Penile cancer ranked as 17th in males, with a frequency of 0.7%. There were no further details of the nature of the penile cancer mentioned in the study, but most probably secondary to the extensive penile shaft scarring following the traditional pubic circumcision known as Tihama-Circumcision.[20]

In 1995 and 1996, there were 2 cancer reports from Madina Al Munawarah and Northern regions[21,22] but there was not much of a report on GUC. In both studies, none of the GUC was among the 10 most common cancer reported. The first regional population based study on cancer in the KSA was published in 1997. The study was conducted in the Eastern region during the period from 1978 through to 1988, but published 10-years

later. The study was well designed and contains more accurate data than any other regional study.[23] The data of this study goes along with the figures seen in the report of NCR, where bladder cancer was among the 10 most common cancers and the frequency of GUC was 12%, which is the highest in the country. It is worth to note that the frequency of GUC in the Eastern region in the regional as well as in national reports is higher than the other regions (**Table 3**). Again, no single report of penile cancer was reported in this study. **Table 4** listed important data of all the above mentioned regional studies including National Cancer Registry data. Hospital based data on distribution of GUC[24-26] were reported in the 90s showing almost the same frequency in regards to testicular cancer, but there was an under or over distribution of data for bladder and prostate cancer by 9% as shown in **Table 5**. It is obvious from the aforementioned data that there has been a changing pattern of GUC in KSA, comparing the recent information of the NCR with the listed literatures which goes back more than 50-years. The reasons behind these changes are multifactorial. Among these factors is the ease availability of education, health facilities, the urbanization and cancer awareness of the population, and the longer life span of population that doubled over the past 50-years.

As mentioned above, there are regional variation in the incidence of GUC as well as in the different types of GUC, as reflected in the recent NCR data.[3] The 5 regions with the most common bladder cancer among males are Al Baha 12%, followed by Gizan 7%, while Asir, Eastern and Al Jouf recorded 6% each. Regarding the prostate cancer, Al Jouf region recorded the highest figure with 7% followed by Riyadh, Eastern and Makkah at 6% each. Regions with high incidence of kidney cancer are Asir, Najran and Northern, all of which reported equal incidence of 4%. Testicular cancer was recorded as most common cancer in male in only one region, which is Al Jouf. It seems that Al Jouf and Eastern regions are the regions with higher prevalence of GUC in KSA. The regions with less GUC prevalence are Najran and Hail, while Al Qassim is the only region that did not show any GUC among the most common cancer in male.

In conclusion, the incidence of GUC in KSA is relatively low. Unlike in the Western countries, bladder cancer is the most common cancer of GUC. Kidney and testicular cancers have the same prevalence as in developed countries. The prostate cancer has low incidence as compared to developed countries. Extremely rare is the incidence of penile cancer. Regional variation in incidence of the different types of GUC is obvious. There has been a big change in the pattern of GUC in KSA during the past 50-years. This change is going to be more obvious knowing that in the year 2020 the percentage of population over the age of 65 will increase by 195%.[1] For that reason, more epidemiological studies and further collection of data and analysis is essential to aid in planning and monitoring the GUC burden.

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