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Incidence Rates, Pattern and Time Trends of Registered Cancer in Iraq (1991-2008) Population and Hospital Based Registry

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Abstract

Background: Global cancer rates have been increasing primarily due to many reasons: an aging population and lifestyle changes in the developing world were major causes. In 2008, approximately 12.7 million cancers were diagnosed and 7.6 million people died of cancer worldwide. Objectives: To study the epidemiological patterns of the top 10 registered cancers over the years of 1991-2008 in Iraq. To identify the socio-demographic characteristics and determinants of cancers in Iraq and to identify time trends. Results: The study revealed that the number of cancer cases registered was 5720 in Iraq (31.05) per 100,000 in 1991 to 14,180 (44.46) per 100,000 population in 2008. While age incidence of cancer in Iraq increased with age, starting from almost 7 cases per 100,000 population at age below 10 years to 398 cases per 100,000 population at age 70 years old, the top 10 cancer incidence in Iraq was breast cancer followed by lung cancer, leukemia, bladder cancer, brain and CNS, non Hodgkin's lymphoma, colo-rectal cancer, stomach cancer, skin cancer excluding melanoma, larynx cancer. Cancer incidence rate significantly increases after 2000 (mean incidence was around 55 cases per 100,000 population) in comparison with the period before 2000 (mean incidence was 40 cases per 100,000 population). The highest age incidence rate is the age of 70 years of (397 per 100,000) followed by 65+ years (327 cases per 100,000 population). Conclusion: Cancer incidence in Iraq is relatively high and trends are up going in terms of quantity and variables related like age sex etc. The figures reflect little increment due to population growth. Prevention and management of cancer are still inadequate. Recommendations: Strengthening the national cancer prevention, cancer therapeutic and cancer registry program to improve cancer related outcomes; addressing effective interventional strategies in terms of risk management, life style promotion and hazardous exposure through establishing national health related multistakholders projects.

Keywords

Incidence Rate; Pattern; Cancer; Iraq

1. Introduction

Global cancer rates have been increasing primarily due to many reasons like aging population and lifestyle changes in the developing world [1]. The most significant risk factor for developing cancer is the age [2]. Although it is possible for cancer to strike at any age, most people who are diagnosed with invasive cancer are over the age of 65 [2] [3]. Some of the association between aging and cancer is attributed to immune-deterioration [4], errors accumulated in DNA over a lifetime [5], and age-related changes in the endocrine system [6].

In 2008, approximately 12.7 million cancers were diagnosed (excluding non-melanoma skin cancers and other non-invasive cancers) and 7.6 million people died of cancer worldwide [1]. Cancers as a group account for approximately 13% of all deaths each year with the most common being: lung cancer (1.4 million deaths), stomach cancer (740,000 deaths), liver cancer (700,000 deaths), colorectal cancer (610,000 deaths), and breast cancer (460,000 deaths) [7]. This makes invasive cancer the leading cause of death in the developed world and the second leading cause of death in the developing world [1]. Over half of cases occur in the developing world [1]. The three most common childhood cancers are leukemia (34%), brain tumors (23%), and lymphomas (12%) [7]. Rates of childhood cancer have increased by 0.6% per year between 1975 to 2002 in the United States [8] and by 1.1% per year between 1978 and 1997 in Europe [7]. In 2007, the overall cost of cancer in the US—including treatment and indirect mortality expenses (such as lost productivity in the workplace)—was estimated to be $226.8 billion. In 2009, 32% of Hispanics and 10% of children 17 years old or younger lacked health insurance; uninsured patients and those from ethnic minorities are substantially more likely to be diagnosed with cancer at a later stage, when treatment can be more extensive and more costly [9].

Study objectives:
- To study the patterns of the top 10 registered cancers over the last 20 years in Babylon and middle Euphrates governorate in middle part of Iraq in relation to socio-demographic characteristics.
- To study the time trends of cancer incidence for the top 10 registered cancers in Babylon and middle Euphrates governorate/middle of Iraq

Population and methods:

Retrospective records review the incidence data from the population and hospital-based Cancer Registry of Iraq and Cancer registry at Iraqi Cancer registry (Iraqi council for cancer registration/MOH/Baghdad). Data of cancer cases and deaths obtained from the Official State Database for the period 1990-2008 were used. Incidences were calculated. Time trends were obtained. 196,304 registered cases were interpreted: 99,831 were males and 96,304 were females.

2. Results

The study revealed that in **Figure 1** the number of cancer cases registered was 5720 cancer in Iraq (31.05) case per 100,000 in 1991 to 14,180 case (44.46) per 100,000 population 2008 while **Figure 2** revealed that age incidence of cancer in Iraq is increasing with older age group starting from almost 7 case per 100,000 population at age below 10 raising to 398 case per 100,000 population at age group 70 years old. **Table 1** showed that cancer incidence rate significantly increase for the years after 2000 (Mean incidence was (around 55 case per 100,000 population in comparison with the period before 2000 (mean incidence was (40 case per 100,000 population) and the number of cancer case registered was 5720 cancer in Iraq (31.05) case per 100,000 in 1991 to 14,180 case (44.46) per 100,000 population 2008. **Table 2** and **Figure 2** revealed that the t age incidence rate is the age of 70 years of (397 per 100,000) followed by 65+ (327 cases per 100,000 populations), **Table 3** Estimated Population of Iraqi by age and gender 2008 while **Table 4** revealed the top 10 cancer incidence in Iraq which was breast cancer followed by lung cancer, leukemia, bladder cancer, brain and CNS, non Hodgkin's lymphoma, colo-rectal cancer, stomach cancer, skin cancer excluding melanoma, larynx cancer.
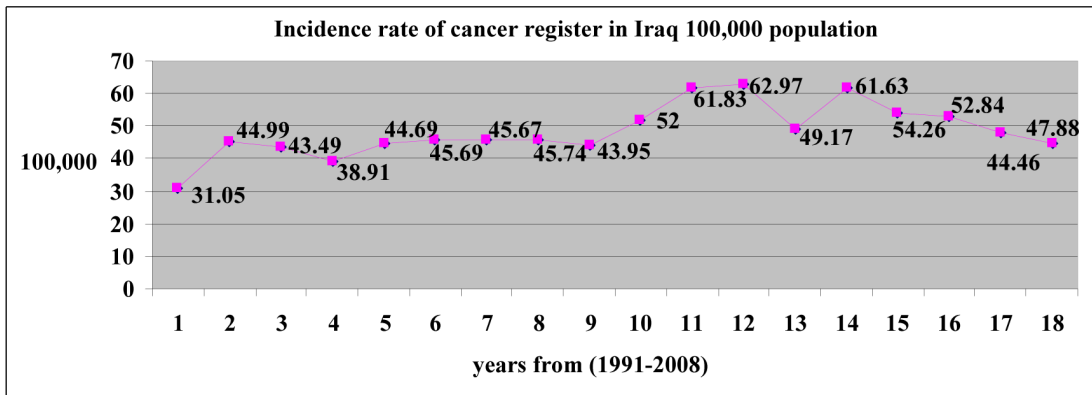
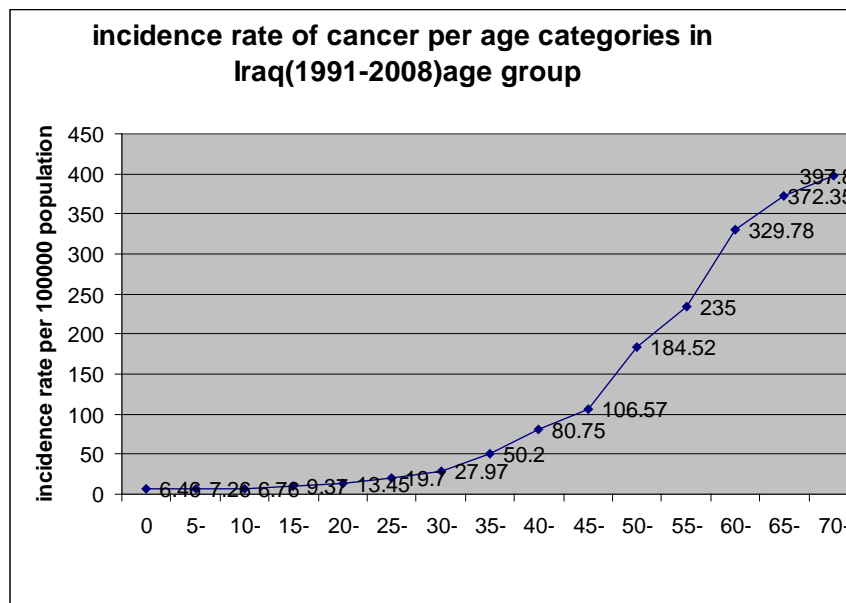**Figure 1.** Incidence rate registered in Iraq (1991-2008).

Figure 2. Incidence rate of cancer per age categories in Iraq (1990-2008).

3. Discussions

The study showed that the number of new cases registered was razing from 5720 in 1991 to 14,180 case on 2008 which is equal almost to three times increment of cancers in Iraq increased from 83 cases per 100,000 population in 1990 to 996 per 100,000 population in 2011 and this result is similar with the result of (Crocetti E., 2002) [10] which showed increase of cancer incidence and mortality in Italy/Florence [11] [12], this result can be explained by increase exposure to risk factors specially life style one as well as good cancer registry services.

Over all figures of Cancer incidence in Iraq showed more prevalence among.

Male than females from 1991 up to 2000 then equal male female distribution with slightly increase registered female incidence than male which is similar to a study carried out in Sweden [13] (Li, X.; Mutanen, P.; Hemminki, K., 2001), yet better registry for breast and cervical cancers due to applying public health screening programs become more predominant after the year 20,000 which make the overall prevalence more among females in comparison male in spite of lung cancer is significantly reported among males in Iraq.

As for the age trend, current study shows the highest incidence rate among the age group 65Y and above age groups which is similar of the results of a study carried out in Ireland (Irish Cancer Registry, 2006) [14]) that showed the highest incidence at the age group 74 - 84 which can be explained on the base of deteriorating immune status, aging of the cells and the chronic cytological irritation and degeneration among Iraqi population is

Table 1. Cancer incidence registered in Iraq (1991-2008) based on gender.

Year	NO of new cases register	Male NO	%	Female NO	%	Registered cases per 100,000 Population
1991	5720	3125	54.63	2595	45.37	31.05
1992	8526	4735	55.54	3791	44.46	44.99
1993	8471	4632	54.68	3839	45.32	43.49
1994	7785	4230	54.34	3555	45.66	38.91
1995	7947	4344	54.66	3604	45.34	44.69
1996	8360	4466	53.42	3894	46.58	45.69
1997	8592	4521	52.62	4071	47.38	45.67
1998	9033	4774	52.85	4259	47.15	45.74
1999	8936	4556	50.98	4380	49.02	43.95
2000	10,888	5376	49.38	5512	50.63	52.00
001	13,332	6758	50.69	5674	49.31	61.38
002	13,985	6964	49.80	7021	50.20	62.97
003	11,248	5698	50.66	5550	49.34	49.17
004	14,520	7525	51.83	6995	48.17	61.63
005	15,172	7505	49.47	7667	50.53	54.26
006	15,226	7377	48.45	7849	51.54	52.84
007	14,213	6656	46.83	7557	53.16	47.88
008	14,180	6589	46.47	7591	53.53	44.46
Total	196,135	99,831	50.90	96,304	49.10	-

Table 2. Estimated Population of Iraqi by age and gender 2008.

Age group	Male	Female	Total
0 - 4	2,737,428	2,602,122	
5 - 9	2,327,723	2,207,838	4,535,561
10 - 14	1,970,148	1,903,924	3,874,072
15 - 19	1,752,751	1,692,593	3,445,344
20 - 24	1,499,023	1,451,756	2,950,779
25 - 29	1,272,624	1,245,065	2,517,689
30 - 34	1,061,612	1,054,904	2,116,516
35 - 39	66,556	878,434	1,744,990
40 - 44	671,299	705,874	1,377,173
45 - 49	531,995	569,631	1,101,626
50 - 54	407,517	442,234	849,751
55 - 59	314,272	343,178	657,450
60 - 64	234,608	253,292	487,900
65 - 69	165,788	184,693	350,481
70+	244,808	301,947	546,755
Total	1,605,152	15,837,485	31,895,637

Table 3. Cancer age specific rate per 100,000 populations in Iraq 2008.

Age group	Male No of cases	Incidence rate	Female No of cases	Incidence rate	Total NO of cases	Total Incidence rate
0 - 4	194	7.09	151	5.80	345	6.46
5 - 9	199	8.55	130	5.89	320	7.25
10-	158	8.02	104	5.46	262	6.76
15-	175	9.9	148	8.74	323	9.37
20-	202	13.4	195	13.43	397	13.45
25-	205	16.11	291	23.37	496	19.70
30-	207	19.50	385	36.50	592	27.97
35-	295	34.04	581	66.14	876	50.20
40-	352	52.44	760	107.67	1112	80.75
45-	335	62.97	839	147.29	1174	106.57
50-	580	143.33	988	223.41	1568	184.52
55-	676	215.10	869	253.22	1545	235.00
60-	867	369.55	742	202.94	1609	320.78
65-	774	466.6	531	287.50	1305	372.35
70-	1331	543.69	844	279.52	2175	397.80
Unknown	39	-	33	-	72	-
All	6589	41.03	7591	47.93	14180	44.46

Table 4. Commonest 10 cancers in Iraq 2008.

Cancer Site	No of cases	Male	Female	% of Total	Rsegisterd case/100,000 population
Breast cancer	2729	92	2637	19.25	8.56
Bronchus and lung	1375	975	400	9.70	4.31
Leukemia	860	555	405	6.77	3.01
Urinary Bladder	881	667	214	6.21	2.76
Brain & other CNS	780	406	374	5.50	2.24
Colorectal cancer	693	378	315	4.89	2.17
stomach	471	274	197	3.32	1.48
Skin (excluding melanoma)	367	215	152	2.59	1.15
Larynx	334	251	83	2.36	1.05
Total 10	9306	4247	5059	65.63	29.18
All sits	14,180	6589	7591	100.00	44.46S

shorter than western and most of the cancers cases in Iraq I are younger age group [15] [16], this finding raise the issue of demographic characteristics of cancer in Iraq.

Has been identified by current study that the top 10 cancers in Iraq is as follow top 10 cancer incidence in Iraq which was breast cancer followed by lung cancer, leukemia, bladder cancer, brain and CNS, non Hodgkin's lymphoma, colo-rectal cancer, stomach cancer, skin cancer excluding melanoma, larynx cancer which is similar to many other studies in the region [17].

4. Conclusion

Cancer incidence in Iraq is relatively high and trends are up going in terms of quantity and variables related like age, sex, etc. Prevention and management of cancer are still inadequate.

5. Recommendations

Strengthening the national cancer prevention, cancer therapeutic and cancer registry program to improve cancer related outcomes.

Addressing effective interventional strategies in terms of risk management, life style promotion and hazardous exposure through establishing national health related multistakholders projects.

6. Declaration

Ethical standards were applied in the study. There is no conflict of interest and no fund received so far to carry out this research.

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