

COMMENTARY

Experience and Outcome of Population-based Cancer Registration in Basrah-Southern Iraq in 2005-2008

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Abstract

Introduction: This paper describes recent population-based cancer registration in Basrah-Southern Iraq and presents a profile on the outcome over a period of four years (2005-2008). **Objectives:** During these four years, extensive work was done to create a culture of a scientific approach to cancer, to enhance adequate cancer registration and subsequently to quantify the risk and enhance actions for its control within a national strategy. **Methods:** Since 2005 cancer cases which are diagnosed and/or treated at any of the major hospitals and governmental diagnostic facilities in Basrah are reported to the Cancer Control Centre (the main registration office). Additional cases are also notified from the Cancer Registration Section at the Department of Pathology and Forensic Medicine, College of Medicine, University of Basrah (which compiles histopathologically ascertained cases) and from haematological laboratories. To back up these sources, all accessible records for the period in question at the level of Basrah governorate (hospitals, registries, laboratories, specialized oncology centres and early detection centres) were checked for verification of all newly diagnosed cancer cases. For this purpose, individual records of every diagnosed case were examined and every case of cancer was identified and added to the pool of cases. Data on all reported cases were re-fed on an excel programme and carefully checked for repetition and apparent errors. The verified cases were used in this paper to present an estimate of the incidence of cancer in Basrah during 2005-2008. **Results:** A total of 8,748 cases were compiled, 72.9% being inhabitants of Basrah governorate and 27.1% from outside. The reported numbers for the years 2005, 2006, 2007 and 2008 were 1,850, 2,155, 2,410, and 2,333, respectively, males and females accounting for 48.1% and 51.9% of cases. The five leading cancers during 2005-2008 were those of breast, urinary bladder, lymphomas, lung and bronchus and leukaemias. **Conclusion:** Population-based registration is a strong prerequisite for a dynamic strategy on cancer control encompassing prevention, treatment, and registration. It is the only means to deal effectively and sensibly with an ever increasing health problem. Doctors' roles in cancer registration are crucial.

Keywords: Cancer - Basrah, Iraq - cancer registration - incidence data

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Introduction

Cancer is a growing health problem in Asia, the Middle East and in Iraq (Tawarneh and Nimri, 2007; Al-Hamdan et al., 2008; BCRG, 2009; Salim et al., 2009; 2010). Yet, the strategic measures now in place to deal with the problem are not up to its magnitude. Registration is not adequate in almost all countries, preventive and curative care is defective and the outcome is worrying in terms of fatality, cost and rising risk.

The situation in Iraq as a whole and in Basrah in particular has been especially complicated further by the harsh condition to which the country was exposed for the last three decades. Wars, economic sanctions and the violence has struck all infrastructure in the country and lead to deterioration in the health indicators of the population (Alwan, 2004). Despite efforts to deal with

cancer since the mid-1970s, the true picture and actions to deal with it remain lagging behind.

In an attempt to improve the data base on cancer in Basrah, to estimate the risk of cancer and to enhance better health care for people at risk of cancer, a research team was formed (Basrah Cancer Research Group) and launched a four-legged project. 1. Measurement of environment pollution and mapping of major pollutants with specific emphasis on pollution with radioactive matters like depleted uranium. 2. Improvement of cancer registration and creation of population-based cancer data base (population-based cancer registry). 3. Research to measure the extent of cancer in terms of incidence and mortality and to ascertain the relationship of cancer to possible risk factors including exposure to radioactive material and other suspected risk factors. 4. Improvement of care provided to cancer patients at the level of structure, process

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and outcome (better survival and quality of life). A detailed report on the work of the team has been recently published by the University of Basrah (BCRG 2009).

What was Done?

A network of registration units were initiated and supported in Basrah consisting of: hospital-based registration units which compile data on cases admitted to hospitals; histopathological registration section at the Department of Pathology, College of Medicine which compiles data on solid cancers ascertained by histopathological and cytological methods; breast cancer early detection centre which deals specifically with efforts to detect breast cancer as early as possible; other registration activities at specialized treatment centres.

Data generated by these various sources are all transferred to the Cancer Control Centre in Basrah, which in turn transfers the data to Iraqi Cancer Board in Baghdad. Also all data are transferred to the Cancer Research Unit at the College of Medicine, University of Basrah for verification and epidemiological analysis. During the four years 2005-2008, these activities were supported by extra work in which all inpatient records in hospital wards where cancer patients are expected to be admitted were thoroughly examined to identify any unregistered cases and also to validate the coverage by official cancer registration system.

Outcome of four years work

At the national level. The group contributed to the drafting of a national cancer control strategy emphasizing six areas: Registration; Prevention; Treatment; Palliative care; Research; Voluntary work.

Table 1. Average New Cancer Cases Registered in Basrah 2005-2008

Site	No.	% of Total
1. Breast	353.8	16.2
2. Urinary bladder	199.8	9.1
3. Lymphomas (NHL&HD)	179.8	8.2
4. Lung & Bronchus	160.8	7.4
5. Leukaemias	152.8	7.0
6. Colon-rectum	85.3	3.9
7. Skin	81.5	3.7
8. Bones	80.5	3.7
9. Central nervous system	80.3	3.7
10. Stomach	74.5	3.4
11. Larynx	55.3	2.5
12. Uterus-cervix	53.5	2.5
13. Kidney	49.0	2.3
14. Ovary	48.0	2.2
15. Thyroid	40.8	1.9
16. Soft tissue	40.8	1.9
17. Pancreas	39.8	1.8
18. Prostate	22.8	1.1
Sub-total	1798	82.2
All other sites	389	17.8
Grand total	2187	100.0

At the Basrah level. The group focused on: Activation of population-based cancer registration; Encouraging research; Improvement of medical care; Initiation of a joint initiative (Basrah Cancer Registry Group, Local NGO and a number of parliament members) to support cancer patients.

Basrah Cancer Registry Group Results

The four-year effort resulted in registering a total of 8748 cases regardless of the place of residence (Table 1). Five cancers (breast cancer, urinary bladder cancer, lymphomas, lung cancer and leukaemias) accounted for nearly half of all registered cases (47.8%). Other important cancers include those of colon-rectum (3.9%), skin (3.7%) bones (3.7%), CNS (3.7%), stomach (3.4%) and larynx (2.5%). In females, cancers of uterus-cervix (2.5%) and ovary (2.2%) are also important among females.

In 2005, a total of 1850 cases were registered. The number increased in subsequent years to 2155, 2410 and 2333 cases in 2006, 2007 and 2008 in that order. The number registered is a function of risk of cancer, attractiveness of health care institutions in Basrah and completeness of registration.

Nearly 72.9% of registered cases were drawn from the population of Basrah province, 16.2% were drawn from the population of Thi Qar, 8.6% from the population of Missan and 2.3% from all other provinces. The number for Basrah is very likely to approximate the true incidence of cancer in the four-year period. Some 48.0% of the newly diagnosed and registered cancer cases were males while 52.0% were females.

Regarding the distribution by sex, Table 2 gives a comparison of the most common major cancers. With the exception of breast cancer, primarily found in females,

Table 2. Cancer Cases Registered for Basrah Province for the Years 2005-2008 by Site and Sex

Site	Male		Female	
	No.	%	No.	%
1. Breast	42	1.4	1030	30.2
2. Urinary bladder	407	13.7	139	4.1
3. Lymphomas (NHL& HD)	272	9.2	176	5.2
4. Lung	303	10.2	101	3.0
5. Leukaemias	178	6.0	143	4.2
6. Skin	140	4.7	137	4.0
7. Colon-rectum	143	4.8	110	3.2
8. Bones	135	4.6	95	2.8
9. Central nervous system	130	4.4	100	2.9
10. Stomach	119	4.0	103	3.0
11. Larynx	121	4.1	51	1.5
12. Uterus &cervix	-	-	161	4.7
13. Ovary	-	-	138	4.0
14. Soft tissue	71	2.4	60	1.8
15. Kidney	60	2.0	63	1.8
16. Thyroid	30	1.0	91	2.7
17. Pancreas	65	2.2	53	1.6
18. Prostate	75	2.5	-	-
Sub-total	2,291	77.3	2,751	80.6
All other sites	674	22.7	661	19.4
Grand Total	2,965	100.0	3,412	100.0

Table 3. Top Ten Cancers in Basrah Province 2005-2008 (IR/100,000)

Males		Females	
Site	IR (ASIR)	Site	IR (ASIR)
Urinary bladder	8.9 (18.9)	Breast	23.1 (32.6)
Lung	6.6 (13.8)	Lymphomas	3.9 (5.5)
Lymphomas	6.0 (7.8)	Uterus-cervix	3.6 (5.4)
Leukaemias	3.9 (4.3)	Leukaemias	3.2 (3.9)
Colon-Rectum	3.1 (5.0)	Urinary bladder	3.1 (6.3)
Skin	3.1 (5.6)	Ovary	3.1 (4.1)
Bones	3.0 (3.7)	Skin	3.1 (5.6)
CNS	2.8 (3.4)	Colon-Rectum	2.5 (4.0)
Larynx	2.6 (5.3)	Stomach	2.3 (3.8)
Stomach	2.6 (4.7)	Lung	2.3 (4.3)
Subtotal	42.6 (72.4)	Sub-total	50.2 (75.5)
All cancers	76.5 (112)	All cancers	64.9 (108)

ASIR, age standardized incidence rate using world population; IR, annual crude incidence rates

most of other cancers (excluding sex-specific cancers namely those of uterus, cervix and ovary) are more frequent among males. The only other exception are thyroid and kidney cancers.

The annual crude incidence rates (IR) and the age standardized incidence rates (ASIR) of the ten leading cancers among females in Basrah during the years 2005-2008 are shown in Table 3. Table 4 shows the distribution of all solid malignancies registered in Basrah regardless of place of residence during 2005-2008 according to their histopathological type, in addition to leukaemias which are diagnosed by haematological methods. These ten histopathological types account for 78.1% of all verified solid malignancies and 70.7% of all verified cases by histopathology and haematology. All other types excluding leukaemias represent 19.8%. Leukaemias of all types represent 9.4% of total registered cases.

Regarding the age specific incidence rates (see Table 5), higher rates are noticed in male children compared to female children up to age 14 years, and then the rates

Table 4. Histopathological Types of All Solid Malignancies in 2005-2008

Histopathological type	No.	%
1. Adenocarcinoma	1114	17.2
2. Ductal cell carcinoma	1010	15.6
3. Squamous cell carcinoma	818	12.6
4. Carcinoma	450	7.0
5. Non-Hodgkin's lymphoma (NHL)	397	6.1
6. Transitional cell carcinoma	382	5.9
7. Hodgkin's Disease	180	2.8
8. Papillary carcinoma	114	1.8
9. Fibrosarcoma	58	0.9
10. Astrocytoma	57	0.9
Ten top types	4,580	70.7
All other solid malignancies	1,285	19.8
Total solid malignancies	5,865	90.5
Leukaemias	611	9.4
Grand total*	6,478	100.0

* 2270 cases were excluded from this table because their histopathological typing was not at the researchers' disposal at the time of writing this report

become higher among females until the age of 70 years when the rates become higher for males. In addition, the risk of cancer is higher for females (sex-specific incidence rate is 75.5 and the age standardized incidence rate is 111.6 per 100000 population) than for males (sex-specific incidence rate is 64.9 and the age standardized incidence rate is 107.7 per 100000 population).

Comparison with Other Arab Countries

A comparison of the first five cancers in the Arab countries or which population-based data on cancer incidence are available is given for males in Table 6 and for females in Table 7. The data are from Cancer Incidence in Five Continents (Curado et al., 2007) or separately published (Bazarbashi et al., 2001; Freedman et al., 2007).

In males, clearly there is some variation in the impact of tobacco since cancer of the lung and larynx is the most

Table 5. Cancer Cases Registered in Basrah Province for the Years 2005-2008 by Age and Sex

Age in years	Males			Females		
	Numbers In 4 years	%	Annual IR per 100000	Numbers In 4 years	%	Annual IR per 100000
< 5	120	4.1	21.0	78	2.4	14.5
5-9	97	3.3	17.3	74	2.2	13.7
10-14	82	2.8	15.6	61	1.8	12.4
15-19	99	3.4	20.3	93	2.8	20.4
20-24	93	3.2	20.2	92	2.8	20.4
25-29	92	3.2	21.4	176	5.3	33.5
30-34	127	4.4	32.0	168	5.1	48.9
35-39	151	5.2	51.7	265	8.0	92.9
40-44	142	4.9	70.7	355	10.7	139.7
45-49	183	6.3	95.4	352	10.6	202.1
50-54	255	8.8	174.5	403	12.2	220.4
55-59	265	9.1	252.3	290	8.8	260.1
60-64	395	13.6	411.8	348	10.5	520.3
65-69	287	9.9	523.6	239	7.2	595.5
70-74	279	9.6	763.5	187	5.6	524.2
75 +	235	8.1	857.5	130	3.9	323.9
Total	2,902*	100.0	64.9	3,311**	100.0	75.5
Age standardized incidence rate			107.7			111.6

* 63 cases could not be classified but included in the calculation of total and ASIR rates; ** 101 cases could not be classified but included in the calculation of total and ASIR rates

Table 6. Top Five Cancers in Arab Populations in Males

Basrah, Iraq		Kuwait		Bahrain		Oman		Saudi Arabia		Gharbia, Egypt		Jordan		Israel/Palestine	
Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR
UB	18.9	Lung	15.6	Lung	34.2	Stomach	13.4	Liver	5.9	UB	27.9	Lung	16.4	Lung	40.4
Lung	13.8	CR	13.6	UB	14.7	Prostate	10.5	CR	4.8	Liver	21.9	UB	13.2	Prostate	20.0
Lymph	7.8	Prostate	10.5	Prostate	14.3	Lung	9.8	Lymph	4.4	Lung	14.4	CR	11.5	CR	18.9
Leuk	4.3	Lymph	10.4	CR	12.3	Lymph	8.2	Lung	4.1	Lymph	16.9	Prostate	11.2	UB	18.1
CR	5.0	Liver	8.1	Stomach	8.5	Liver	7.4	Leuk	3.9	Prostate	8.5	Lymph	7.3	Lymph	10.0
All	76.5	All	121	All	160	All	105	All	59	All	162	All	115	All	183

ASIR, age standardized incidence rate using world population; CR, colorectal; UB, urinary bladder

Table 7. Top Five Cancers in Arab Populations in Females

Basrah, Iraq		Kuwait		Bahrain		Oman		Saudi Arabia		Gharbia, Egypt		Jordan		Israel/Palestine	
Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR	Site	ASIR
Breast	32.6	Breast	41.3	Breast	46.8	Breast	14.6	Breast	11.8	Breast	42.5	Breast	38.0	Breast	38.5
UB	6.3	CR	11.8	Lung	11.8	Stomach	6.2	CR	4.9	Lymph	9.9	CR	10.2	CR	14.5
Lymph	5.5	Thyroid	7.3	Thyroid	7.7	Ovary	6.2	Thyroid	4.4	Brain	6.2	Corpus	5.8	Lymph	9.1
Cervix	5.4	Lymph	6.5	Ovary	7.4	Cervix	6.5	Lymph	4.1	Ovary	5.1	Lymph	5.4	Corpus	9.0
Leuk	3.9	Ovary	5.4	CR	7.3	Thyroid	5.9	Leuk	2.7	Liver	4.5	Ovary	4.6	Thyroid	7.0
All	65	All	129	All	143	All	91	All	59	All	162	All	115	All	183

ASIR, age standardized incidence rate using world population; CR, colorectal; UB, urinary bladder

prevalent in Palestine, Jordan, Bahrain and Kuwait, all relatively affluent, but superceded by urinary bladder in Basrah and Egypt. There appear to be major differences in the latter, since bladder cancer appears relatively rare in the Saudi Arabian peninsular, in clear contrast to the high prevalence elsewhere. The opposite is partly the case for prostate and colorectal cancers, where Westernization of diet and obesity might play roles. Particular factors are presumably involved in the high incidences of liver cancer in Saudi Arabia and Egypt, and stomach cancer in Oman (Salim et al., 2009; 2010).

In Iraqi females, as elsewhere in the region, breast cancer is very much the most common cancer, with cervical cancer being relatively rare. However, in contrast to the more affluent countries, ovarian and thyroid cancers are still outside of the first five.

In conclusion, this first report of population based data from Basrah builds on the earlier hospital-based findings (Habib et al., 2006; 2007) and represents a major step forward towards a cancer control program in our region of Iraq and hopefully the entire country in the future.

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