RESEARCH ARTICLE

Incidence of Cancer in Basrah: Results of a Household Survey

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Abstract

Background: Cancer is a major health problem at global level. It is increasingly registered in Iraq and Basrah but the epidemiological situation, though becoming better documented, is still questionable regarding the adequacy of data. Objective: The study aimed to measure the incidence of cancer in Basrah. Materials and Methods: The results presented in this paper are part of a large household survey carried out in Basrah governorate-southern Iraq over a 12 month period (January to December 2013). It involved a detailed interview with adult respondents from each and every household enrolled in the study during a three-year recall period about the incidence of cancer. A total of 6,999 households were covered yielding 40,684 persons. Results: The total number of new cancer cases reported over the three- year recall period (2010-2012) was 112. The average annual incidence rate of all cancers was 91.8 per 100,000 population with a higher rate for females (109.7) compared to males (74.3) The overall age standardized rate was 150.7 per 100,000. The highest incidence rate was recorded for the Southern part of the governorate (Abul-Khasib and Fao) at 138.8 per 100,000 and the lowest was for East of Basrah (Shatt-Arab District) at 78.0 per 100,000. With respect to cancer types, the main cancers were those of breast, lung, larynx-pharynx, leukaemia, colon-rectum and urinary bladder. These six cancers accounted for 51.5% of all reported cases. Other important cancers were those of brain, bones, pancreas and liver, accounting for a further 17.9%. Conclusions: The pattern of cancer in Basrah is generally similar to the pattern at the national level in terms of age, sex and topography but the incidence rate according to the present household survey is higher than any previously reported figures. Household surveys for cancer seem feasible albeit difficult and costly.

Keywords: Cancer - incidence - household surveys - Basrah, Iraq

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Introduction

At the international level, the burden of cancer in absolute numbers continues to increase mainly due to the aging of population in many countries and the overall growth of the world population. In addition, changing life style with increasing cancer-causing behaviors, like cigarettes smoking, changing dietary habits and sedentary life are, among others, major contributory risk factors (Jemal et al., 2011).

According to the data presented in the GLOBOCAN 2012 estimates, the risk at global level exceeded 14 million new cancer cases and 8 million cancer deaths with more than half the cases (56%) and just under two thirds (64%) of the deaths occurred in developing countries. Breast cancer is the most incident cancer and the leading cause of cancer death among females. Lung cancer is the leading cancer in males in terms of incidence and mortality (Ferlay et al., 2013). Also inadequate facilities of diagnosis and treatment in most developing countries contribute to higher relative mortality among people with cancer (Murray and Grant 2003; Jemal et al., 2011; Ferlay et al., 2013).

In Iraq and particularly in Basrah in the southern part of the country, cancer has definitely increased in absolute numbers of new cases and numbers of deaths resulting from cancer. It is also believed with some empirical evidence that the incidence rates and mortality rates have increased. This has been documented at least in a number of recent studies in Basrah (BCRG, 2010; Habib et al., 2007; Habib et al., 2010; Hagopian et al., 2010).

A seven-year effort over the years 2005-2011 made by the Basrah Cancer Research Group (BCRG) resulted in registering a total of 17080 new cases regardless of the place of residence. Of these, 11679 (68.4%) were from the inhabitants of Basrah governorate, the rest were from adjacent governorates seeking care in Basrah. Five cancers (Breast cancer, lymphomas (Hodgkin's and Non-Hodgkin's), urinary bladder cancer, lung cancer and leukaemias) are the leading incident cancers over the years 2005-2011 and represent 45% of all new registered cases in Basrah governorate. Other important cancers include those of skin (4.1%), central nervous system (4.1%), colon-rectum (3.4%), Stomach (3.1%) bones (2.8%), Uterus-cervix (2.3%) and larynx (2.3%) (Habib and Al-Ali 2012). At present time, a strategy is adopted in Iraq

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by the Iraqi Cancer Board (Iraqi Cancer Board, 2009). The strategy consists of six approaches: population based registration, prevention, effective curative care through the enhancement of early detection and adequate amenities for treatment, palliative care for difficult and advanced cases, scientific research and voluntary work. One of the most important requirements for the effective control efforts and health care planning is the availability of flow of relevant epidemiological data. The current sources of cancer related data are routine cancer registries, some limited household surveys (Habib et al., 2009; Naseef, 2012; Fashal, 2012) and limited research. Scientifically speaking, these sources would not give a adequate picture about the extent of the problem despite all the efforts involved in recent years to improve population-based cancer registration in Basrah and other governorates. A need was envisaged to validate the official cancer registration in Basrah by a number of means. One of these is a large scale household survey which is the subject of this paper. The survey aimed at a number of objectives, one of them is to measure the incidence of cancer in Basrah governorate using household-based data.

Materials and Methods

Design

The reference population for the present study are all the population normally resident in Basrah governorate during the time of the survey. The study was a cross-sectional survey with retrospective component to inquire about the incidence of cancer and cancer-related deaths during the three years preceding the date of inquiry. A convenient sample of 7000 households with expected 42000 inhabitants was decided. Using a three -year recall period (2010-2012) , this sample would theoretically be equivalent to 21000 households with one -year recall period. A multi-stage cluster sampling approach was adopted as shown in Figure 1: One-two housing clusters (50 households each) was randomly selected from the catchment population of each PHCC. Thus the planned

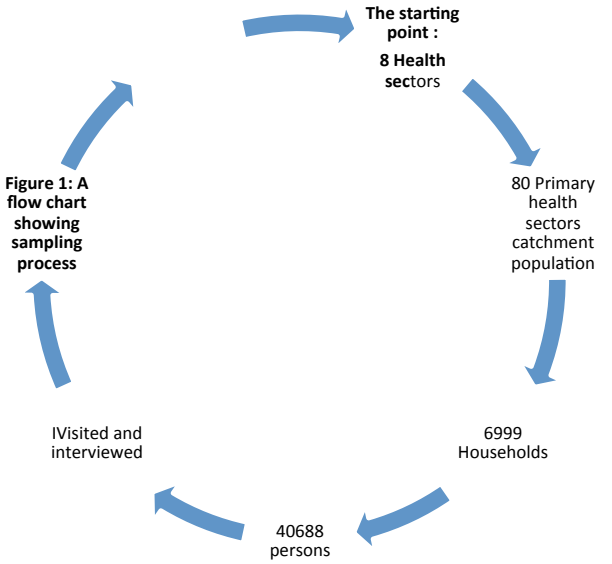

Figure 1. A Flow Chart Showing the Sampling Process

number of households was 4200 (if one cluster is covered)-8400 (if two clusters were covered). The actual number visited and successfully interviewed was 6999 households with a total 40684 persons living in them. A total of 112 new cancer cases were reported by the households to have occurred during the three- year recall period. A sketch map of Basrah governorate is shown in Figure 2

New cases of cancer

A definite diagnosis of any type of cancer as reported by the interviewees and confirmed whenever possible by medical documents.The data were collected through direct interview of adult respondent from inhabitants of each house listed in the sampling frame. The interviewers were trained teams selected from local health facilities and population in each of the eight health sectors in Basrah governorate. Two steps were undertaken before the data collection phase. First full explanation and instructions to each team on details of the study were made. Second; a pilot study was done on 100 households by each of the four teams employed to test the feasibility of using the questionnaire and identify unplanned problems. In addition the questionnaire was discussed with senior staff at Basrah College of Medicine. Some modifications were made in the light of all these activities. At the end of every week, filled forms were collected from interviewers and grossly checked for errors.

Quality control: This included training and regular meetings with interviewers, periodic checking of filled forms and small sample cross-checking. In addition data were fed on computer programmes and checked for consistency and eligibility.

Ethical consideration

The data collection was confidential. Any family who needed any medical help were advised to the best choice possible. The research protocol was approved by the Scientific Committee at the Department of Community Medicine and the Ethical Committee for Research in Basrah College of Medicine.

Statistical analysis

Data were fed on computer programme using Statistical

Figure 2. Sketch Map of Basrah Governorate - Southern Iraq

Package for Social Science-version 15. Incidence rates were calculated by dividing the average number of new cases per year by the total number of population covered by the survey.

Results

Overall: Among the total 40684 individuals covered during the visits to the 6999 households, 112 new cases were reported to have occurred during the period 2010-2012 inclusive giving an average crude annual incidence rate of 91.76 per 100000 population and an age standardized incidence rate of 150.72 per 100000 population. Of these 112 cases, 54 were found alive while the other 58 died within the three years from the time of the diagnosis of the disease.

Age

Table 1 shows that cancer in Basrah affect all people regardless of age. The incidence rate, however, increases steadily with advancing age from 9.34 in children aged less than five years to as high as 914.63 per 100000 in the age group 70-74 years. Figure 3 displays a graphical presentation of age specific incidence rates.

Sex

Table 1 also presents incidence rates by gender. The incidence rate was higher among females (109.74/100000 females) than among males (74.31 /100000 males).

Geographical distribution

Table 2 shows that the highest incidence rate was recorded for the Southern part of the governorate (Abul-Khasib and Faw) at 138.77 per 100000 and the lowest was for East of Basrah (Shatt-Arab District) at 78.40 per 100000.

Topography/anatomical site

Breast cancer was the most frequent cancer accounting for 25.0% of all reported cases or a cause-specific

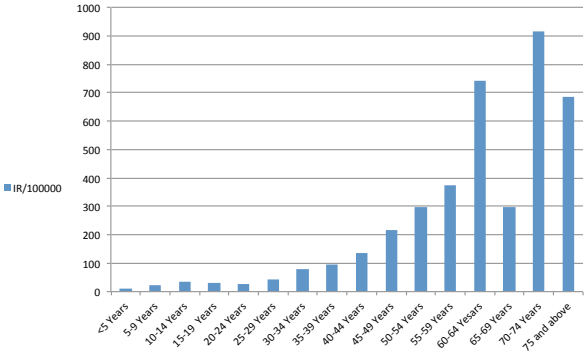

Figure 3. Age Specific Incidence Rate per 100,000 population of all cancer: Basrah 2010-2012

Table 1. Incidence Rates per 100000 Population of New Cancer Cases in Basrah Governorate Over the Years 2010-2012 by Age and Sex

Age in years	Population	New cases in 3 years	Percentages	Average annual IR per 100000 population
<5	7136	2	1.8	9.34
" 5-9"	4653	3	2.7	21.49
" 10 -14"	5074	5	4.5	32.85
15-19	4074	4	3.6	32.73
20-24	3668	3	2.7	27.26
25-29	3114	4	3.6	42.81
30-34	2908	7	6.3	80.24
35-39	2480	7	6.3	94.09
40-44	2195	9	8	136.67
45-49	1590	12	10.7	215.72
50-54	1115	10	8.9	298.95
55-59	800	9	8	375
60-64	810	18	16.1	740.74
65-69	448	4	3.6	297.62
70-74	328	9	8	914.63
75 and above	291	6	5.4	687.29
Sub-total	40684	112	100	91.76
Sex				
Male	20635	46	41.1	74.31
Female	20048	66	58.9	109.74
Sub total	40684	112	100	91.76

Table 2. Incidence Rates Per 100000 Population of New Cancer Cases in Basrah Governorate Over the Years 2010-2012 by Geographical Area

Geographical area	Population	No. of cases in 4 years	Average annual IR per 100000 Population
Basra city	16190	44	90.59
North of Basrah	11947	32	89.28
West of Basrah	5527	13	78.4
South of Basrah	3603	15	138.77
East of Basrah	3419	8	78
Grand total	40684	112	91.76

Table 3. Incident Rates of Cancer by Site

Topography (site)	No of mid-period population	No of cases in 3 years	%	Incidence rate per 100,000 per year
Breast	40684	28	25.0	22.94
Lung	40684	8	7.1	6.55
Colon-rectum	40684	8	7.1	6.55
Leukaemias	40684	7	6.3	5.74
Larynx-pharynx	40684	7	6.3	5.74
Lymphomas	40684	5	4.5	4.1
Bladder	40684	5	4.5	4.1
Brain	40684	5	2.7	4.1
Bones	40684	5	2.7	4.1
Pancreas	40684	5	4.5	4.1
liver	40684	5	0	4.1
Stomach	40684	4	3.6	3.28
Uterus-cervix	40684	3	2.7	2.46
Kidney	40684	3	2.7	2.46
Thyroid	40684	3	2.7	2.46
Spine	40684	3	2.7	2.46
Skin	40684	2	1.8	1.64
Prostate	40684	2	1.8	1.64
All other sites	40684	4	3.6	3.28
Total	40684	112	100.0	91.76

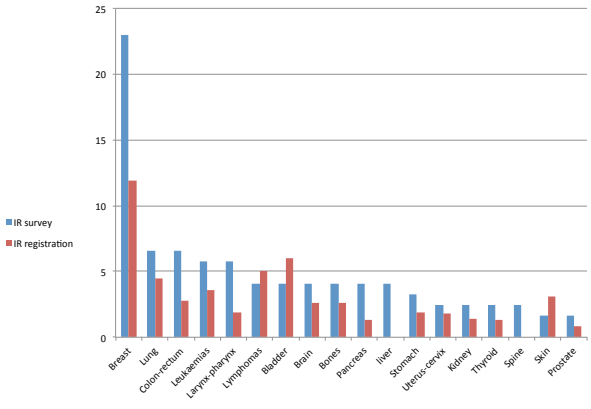

Figure 4. Cancer Specific Incidence Rates: Comparison of Household Survey and Cancer Registration Results

incidence rate of 22.94/100000, followed by cancers of lung, larynx-pharynx, leukaemia, colon-rectum and urinary bladder. These six cancers accounted for 51.5% of all reported cases. Other important cancers were those of the brain, bones, pancreas and liver which together accounted for further 17.9%. Details of the site specific incidence rates are shown in Table 3. Comparing the cause-specific incidence rates using data from the present study and official cancer registration data, the results are displayed in Figure 4. It is obvious that the two patterns are very similar but the household-based incidence rates are consistently higher than the registration-based rates. The gap represent the extent of under-registrations by official registries.

Discussion

Cancer is an important health problem at international (Ferlay et al., 2013), national (Iraqi Cancer Board 2009 (9) and local levels (BCRG 2010, Fashal 2012). Previous studies based on officially registered incident cancer cases showed that the risk of cancer in Basrah is relatively high compared to other parts of Iraq but still within the levels reported in the neighbouring countries. This study was an attempt to measure the incidence of cancer in Basrah governorate through the household survey approach.

The results in the present study agreed to a great extent with the previous results reported for Basrah in terms of the age and gender pattern: incidence rate was higher for females and increases steadily with advancing age. However the overall incidence rate calculated in the present study 91.76 per 100000 population is higher than any other reported figure in Iraqi literature but very close to the figures estimated by the IARC as reported in Globocan 2012 (Ferlay et al., 2013) . These observations indicate that despite all efforts made by the Iraqi Ministry of Health, the Iraqi Cancer Board and the local intensive efforts at the level of Basrah governorate, official registration is still unable to cover all incident cancer cases but it seems that it is moving the right way on the direction

Also the current study and recent studies in Basrah reported incidence rates higher than the rates reported in Basrah two decades ago. This may suggest an increased risk of cancer as a reflection of increased exposure to various risk factors such as life style changes, the aftermaths of various wars and economic sanctions and other exposures. The trend agrees with the international trend of cancer and also with national results reported by other researchers (Husain and Al-Alwacahi 2014). Regarding pattern of cancer by anatomical site, the pattern obtained in this study is very similar to the pattern described on the basis of cancer registry data. This may suggest that the official cancer registration is going the right direction in covering new cancer cases but probably missing some cases. We recommend that official cancer registration efforts are further impowered and validated periodically by sample household surveys.

References

BCRG (2010). Cancer in Basrah: epidemiological analysis of incident cancer 2005-2008. Basrah Cancer Research Group. Dar AlKutub for Press and Publication, Basrah 2010.

Fashal MS, Habib OS, Abdul-Aziz T (2012). A comparative study on cancer in two areas in Samawa city. A confidential Report prepared for the Iraqi Cancer Board and Al-Muthanna Governorate Health Directorate General.

Fathallah RM, Dajani R (2013). Comparison of population based cancer incidence rates among Circassians, Chechans and Arabs in Jordan (1996-2005). *Asian Pac J Cancer Prev*, **14**, 6035-40.

Ferlay J, Soerjomataram I, Ervik M, Dikshit R, Eser S, Mathers C et al (2013). GLOBOCAN 2012, Cancer Incidence and Mortality Worldwide: IARC CancerBase No. 11 [Internet]. Lyon, France: International Agency for Research on Cancer. Available from: http://globocan.iarc.fr, accessed on July 18, 2014.

Habib OS, Al-Ali JK, Al-Wiswasi MK, et al (2007). Cancer Registration in Basrah 2005: *Asian Pac J Cancer Prev*, **8**, 187-90.

Habib OS, Al-Diab JMA, Mohsin A, et al (2010). Experience and outcome of population-based cancer registration in Basrah-Southern Iraq in four years (2005-2008). *Asian Pac J Cancer Prev*, **11**, 51-4.

Habib OS, Al-Ali JK (2012). Cancer in Basrah 2005-2011: Characteristics of person, place and time. Report of limited circulation submitted to the Ministry of Health, Iraq, 2012.

Hagopian A, Lafta R, Hassan J, et al(2010). Trends in childhood leukemia in Basrah, Iraq 1993-2007. *Am J Public Health*, **100**, 1081-7

Husain HY, Al-Alwacahi SF (2014). Incidence rates, rattern and time trends of registered cancer in Iraq (1991-2008):Population and Hospital Based Registry. OALib, 2014, 1, 1-6, Published Online February 2014 in OALib. http://www.oalib.com/journal Accessed April 15, 2014.

Iraqi Cancer Board (2010). Cancer Registry of Iraq 2009. Ministry of Health, Peoples Medical Clinics Press, Baghdad 2010.

Jemal A, Bray F, Center MM, Ferlay J, Ward E , Forman D (2011). Global cancer statistics . *CA Cancer J Clin*, **61**, 69-90.

Murray SA, Grant E (2003). Dying from cancer in developed and developing countries: lessons from two qualitative interview studies of patients and their carers. *BMJ*, **326**, 368.