Cancer mortality in Basrah: a household survey results

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ABSTRACT

Background: **This paper presents some data on cancer related mortality in Basrah governorate during the period 2010-2012 as part of a comprehensive household survey carried out during 2013 to document the extent of cancer and validate the official cancer registration.**

Objective: **The main objective is to present data on cancer mortality in Basrah governorate**

Method: **The study involved visiting 6999 households (families) who were interviewed on, among other aspects, incident cancer and mortality due to cancer during the three-year recall period.**

Results: **A total of 6999 households (families) with 40688 inhabitants were successfully visited and data were collected and analyzed about their cancer experience. Eighty three persons died with cancer during 2010-2012 giving an average annual cancer specific mortality rate of 68.0 per 100000 persons. The mortality rate was higher for females (71.49 per 100000 females) as compared to males (64.61 per 100000 males) and was increasing with advancing age. The leading causes of mortality were cancers of the lung, breast, urinary bladder and colon-rectum. These four cancers accounted for almost half the deaths (49.4%) or 33.6 per 100000 of the population. Within the overall pattern of mortality in the population, cancer came in the 2nd rank after cardiovascular disease.**

Conclusion: **Cancer is an important contributor to mortality in Basrah governorate. The current level of mortality is higher than any previously reported figures.**

Key words: **Cancer, Basrah, Mortality, household surveys**

وفيات السرطان في البصرة: نتائج مسح اسري

خلفية: يعرض البحث الحالي بيانات تتعلق بالوفيات الناشئة عن السرطان في محافظة البصرة خلال السنوات ٢٠١٠–٢٠١٢ كجزء من دراسة كبيرة أجريت في عام ٢٠١٣ لقياس حجم مشكلة السرطان وتقييم مدى كفاءة التسجيل السرطاني في المحافظة.

الهدف: يهدف البحث الحالي الى عرض بيانات عن الوفيات المرتبطة بالسرطان في محافظة البصرة.

الطرائق: تمت زيارة ٦٩٩٩ أسرة انتقيت عشوائيا من مختلف مناطق البصرة واستبانتهم عن الإصابات السرطانية الجديدة والوفيات المرتبطة بالسرطان خلال السنوات ٢٠١٠–٢٠١٢.

النتائج: أظهرت النتائج ان عدد الأفراد الذين كانوا ينتمون إلى الأسر المشمولة بالمسح كان ٤٠٦٨٨ و كان عدد الوفيات خلال السنوات الثلاث ٢٠١٠–٢٠١٢ بسبب السرطان ٨٣ حالة وفاة وكان معدل الوفاة ٦٨ لكل ١٠٠٠٠٠ نسمة. كانت نسبة الوفاة بين الإناث (٧١،٤٩) أعلى مما هي بين الذكور (٦٤،٦١) وتزداد مع تقدم العمر. أما الأسباب الرئيسية للوفاة بسبب السرطان فكانت سرطان الرئة والثدي والمثانة والأمعاء الغليظة حيث شكلت هذه الأسباب الأربعة نسبة ٤٩،٤%من مجموع وفيات السرطان. كما ان السرطان جاء بالمرتبة الثانية بعد أمراض القلب كسبب للوفاة في محافظة البصرة.

الاستنتاجات: يمثل السرطان موقعا مهما كسبب للوفاة في البصرة والنسبة الحالية في هذا المسح أعلى من أية نتائج موثقة سابقا.

كلمات دالة: السرطان، البصرة، الوفيات، مسح أسري

INTRODUCTION

The pattern of morbidity and mortality has changed during the last three decades in developing countries as a result of a number of factors, related to improved economic conditions, increasing control of infectious and perinatal diseases, aging of the population, and increasing prevalence of risk factors for non-communicable diseases (NCD). Cancer became an important health problem in terms of incidence and mortality in these countries.[1] Based on the figures given in the GLOBOCAN 2012 estimates, about 8.2 million cancer deaths were estimated to have occurred in 2012.[2] Just under two thirds (64%) of the deaths occurred in the economically developing countries. Mortality is an important indicator of

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cancer burden. It is also the preferred measure for evaluating secondary prevention programmes. Reduction in mortality is the standard target for improvement in cancer control. Mortality rates have the advantages of their much wider availability than cancer incidence rates, and they are easily obtained than any of the other epidemiological parameters. In addition, no follow-up is needed, death is an unequivocal event, and in many societies a death certificate is required before burial. The main problem is with ascertainment of cause of death. Thus, mortality rates have inherited limitations such as inaccuracy of underlying or contributing cause of death mentioned in death certificate. In addition, mortality rates do not meaningfully reflect the burden of certain cancers with a favorable prognosis. On the other hand, mortality rates (5-10-year mortality rates) may approximate incidence rates for fatal cancers like lung, liver and pancreas.[3-7] Previous studies in Basrah[8-10] indicated that cancer is an important contributor to the overall mortality at population level. All the previous published papers, however, were based on data obtained from official routine statistics which inherit, by their nature, certain limitations such us being incomplete and may be inaccurate.[11] The main objective of this paper was to present an estimation of cancer related mortality in Basrah governorate**.**

SUBJECTS AND METHODS

The data in this paper are part of a comprehensive study, further details of which can be found elsewhere**.**[12] In brief, a convenient multi-stage cluster sample of 6999 households was studied through direct home visit and interview with responsible adult from the designated family. A high response rate was obtained at all stages of sampling as summarized below:

Stage 1:8 sectors out of 8 sectors

Stage 2: 80 of the 100 PHC centres

Stage 3: 100 households from each PHC center catchment population.

The catchment population of each primary health care centre (PHC) was already divided into clusters of houses (3-12 clusters) for purposes related to management of the immunization programme and trace defaulters. These clusters were assigned numbers in each PHC centre and a random sample of 1-2 clusters were drawn to be covered by the study. In each cluster a random starting point was agreed upon with the interviewers and from this point a circular sample is taken until around (50±few) houses are consecutively visited.

A special questionnaire form was formulated for the purpose of the present study to facilitate the collection of relevant data. The questionnaire consisted of four sections:

Section one: general information on the household/family regarding size, income, and characteristics of the accommodation (quality and ownership).

Section two: detailed information on family members(age, sex, education and occupation).

Section three included two basic questions: one on the occurrence of any sort of cancer among family members during the three years preceding the year of interview (2010, 2011 and 2012). The second question was to identify any person who died during the same reference years. In both questions a positive response required response on further details on age, sex, year of occurrence/death and cause of death. Teams of interviewers were carefully selected, trained and instructed to execute the data collection process. The data were entered on two files (excel and SPSS files) for checking and analysis. Results were presented as tables and figures when required. The present article is one of a series of articles related to the whole household survey. It covers cancer related mortality only.

RESULTS

Mortality by age and sex: A total of 83 cancer-related deaths were documented among the study population. The cancer specific annual mortality rate was 68.0 per 100000 population. The distribution of mortality according to age and sex is shown in (Table-1). As a general pattern, the mortality rate increases with increasing age from 5.91 per 100000 in the age group less than five years to as high as 1016.26 per 100000 in the age group 70-74 years. The mortality rate was higher among females (71.49) compared to males (64.61).

Table 1. Cancer specific mortality by age and gender.

Age	No. of mid-period population	No. cancer deaths in 3 years	Average annual cancer mortality per 100000
<5	5640	1	5.91
5-9	6143	1	5.43
10-14	5074	2	13.14
15-19	4074	1	8.18
20-24	3668	3	27.26
25-29	3114	2	21.41
30-34	2909	4	45.85
35-39	2480	3	40.32
40-44	2195	3	45.56
45-49	1590	6	125.79
50-54	1115	12	358.74
55-59	800	8	333.33
60-64	810	14	576.13
65-69	448	9	669.64
70-74	328	10	1016.26
75 and above	291	4	458.19
Total	40688	**83**	**68.0**
Sex			
Male	20638	40	64.61
Female	20050	43	71.49
Total	**40688**	**83**	**68.0**

Mortality by site and geographical area: Lung cancer, breast cancer, urinary bladder cancer, cancer of colon-rectum and brain tumours are the five leading causes of cancer-related mortality as shown in (Table-2). Four other cancers are also major contributors to mortality (liver, stomach, bone, pancreas). These nine sites account for nearly 81.9% or 55.7 per 100000 population. With respect to geographical area, south of Basrah (Abul-Khasib and Faw districts) experienced the highest mortality rate (129.52 per 100000).

Table 2. Cancer specific mortality by site and geographical area.

Variable Site	No. Of mid-period population	No of cancer deaths in 3 years	Cancer specific mortality rate per 100000 per year
Lung	40688	13	10.65
Breast	40688	12	9.83
Bladder	40688	8	6.55
Colon-rectum	40688	8	6.55
Brain/CNS	40688	6	4.92
Liver	40688	6	4.92
Stomach	40688	5	4.10
Bone	40688	5	4.10
Pancreas	40688	5	4.10
Larynx/Pharynx	40688	3	2.46
Leukaemia	40688	2	1.64
Kidney	40688	2	1.64
Lymphomas	40688	1	0.82
Uterus-cervix	40688	1	0.82
Ovary	40688	1	0.82
Prostate	40688	1	0.82
Skin	40688	1	0.82
Thyroid	40688	1	0.82
Total*	**40688**	**83**	**68.00**
Geographical area			
Basrah city	16192	37	76.17
North of Basrah (Hartha, Qurna Mdaina)	11947	16	44.64
West of Basrah (Zubair district)	5527	9	54.28
South of Basrah (Abul-Khasib and Faw districts)	3603	14	129.52
East of Basrah (Shatt Al-Arab district)	3419	7	68.24
Total	**40688**	**83**	**68.00**

***Two cases were of unknown site (Secondaries?)**

***Mortality and incidence**:* Comparing the age-specific mortality to the age-specific incidence rates (Figure-1), it is evident that the two age-specific parameters are consistent and strongly correlated to each other (R=0.91) and it seems that mortality is a reflection of incidence in its major part.

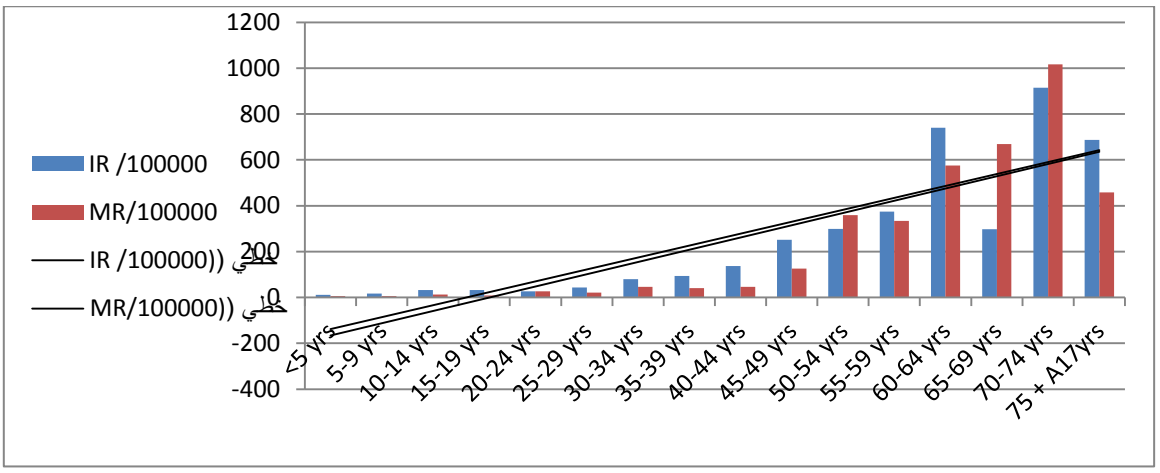

Fig 1. Age specific incidence and mortality rates

This figure shows that the age specific mortality rate is a function of age specific incidence rate regardless of the type of cancer.

Cancer specific mortality within the overall pattern of mortality: To examine the relative importance of cancer as a cause of death in Basrah, (Table-3) shows the main documented causes of death during the three-year recall period (356 deaths). Cancer comes only second (mortality rate=68.0 per 100000) to cardiovascular disease (72.0 per 100000) as a cause of death in Basrah. The other causes are shown in the table. It is worth mentioning here that collective types of accidents (road traffic injuries, other accidents, drowning) occupy a significant position as a cause of death (32.0 per 100000 or 3rd rank after cardiovascular disease and cancer).

Table 3. Pattern of mortality: The leading causes of death in the studied population over the years 2010-2012.

Cause of death	No. Of deaths in 3 years (2010-2012)	Annual cause-specific mortality rate per 100000 population
Cardiovascular	89	72.9
Cancer	83	68.0
Ill-defined causes (Senility)	33	27.0
CVA	28	22.9
Road traffic injuries(RTI)	19	15.6
Respiratory	15	12.3
Renal	14	11.5
Accidents other than RTI	13	10.7
Diabetes mellitus	12	9.8
Diarrhoea	8	6.6
Drowning	7	5.7
Septicaemia	5	4.1
Cerebral palsy	5	4.1
Digestive system	4	3.3
Prematurity	4	3.3
Tuberculosis	3	2.5
Infection	3	2.5
Snake bite	2	1.6
Postoperative complications	2	1.6
Maternal death	1	0.8
Unknown	6	4.9
Total	356	291.7

The estimated crude death rate = 2.92 per 1000

DISCUSSION

Cancer in Basrah received tangible interest from various parties as a growing health problem in which sanctions and wars were implicated in the aetiology.[14-17] Measuring the precise parameters of the burden of cancer (incidence, mortality, prevalence, survival) is a task beyond any individual researcher to achieve. To be as close as possible to the proxy measures, enormous time and effort had been spent during the last nine years (2005-2013) and a tangible success was documented. [8-10, 14-16,18] However, it seems from the experience obtained in these years, sustainability of high quality work on cancer care and registration is rather difficult to maintain. When it comes to mortality, it would be expected that the limitations of the quality of data are less than those related to incidence. Medical and legal bodies or personnel usually ascertain the fact of death. In countries where burial of dead persons requires officially issued death certificates as it is the case in Iraq, death registries can be reliable regarding the total numbers of death during a specified period of time. [19] Incompleteness in death registries may arise early in life when neonates may be borne and die without being registered as births or deaths. This is expected to be very marginal in Iraq and in Basrah for at least four reasons. The first is the requirement that each dead person should be buried. The improved level of socioeconomic status and education is a second enhancing factor for the documentation of vital events. The third is the legal requirement for any event of death to be documented. And the fourth is that the present data are based on people reporting rather than on routine statistics. An event of death is unlikely to be falsely reported or denied as a result of recall problem. With respect to cause of death, some degree of misclassification is possible but this is very unlikely to occur in cancer. Cancer itself is a painful and unforgettable event. In the elderly cancer may be the cause of death but the ascertainment of cause of death is amenable to errors. It is not uncommon to find *"senility"* written as the cause of death in such very old people. In such age group, the incidence of cancer is usually high. This may mean that some cancer deaths are lost and the overall risk of death is underestimated. We did our best during the survey to make the best of the interview and the interviewers did their best to review carefully the death history of any reported case. The data used in this article in the view of the researchers, are reliable. It remains a possibility however, that some errors do exist and one should admit that scientific research results are not always perfect. Regarding the results, it is very evident that cancer mortality affects every age but the risk of death increases with age as indicated by the increasing relative share in the events of death with advancing age. The rising risk of death with advancing age is probably a reflection of accumulated risk of cancer, variation in incidence of various cancers in different age groups and the quality of care received by patients. The effect of genetics and exposure to carcinogens prior to birth and even prior to conception cannot be excluded since a substantial amount of cancer deaths occur very early in life. This is true in Basrah and elsewhere as shown in this paper. The leading cancers as causes of death are not very much different from those reported in previous studies in Basrah[8-10] and in other parts of the world.[7,20] Some of these cancers are related to avoidable risk factors. Breast cancer and lung cancer for example are the two leading causes of death related to cancer in Basrah. Most of lung cancer is related to cigarette smoking; a habit which can be avoided from the start or stopped among those who are used to it. Breast cancer is very fit for screening and early detection which both reduce the mortality and substantially improve survival.[21,22] Evidence from the results in this paper suggest some degree of rise in the risk of cancer death and may be cancer incidence in Basrah. The cancer

specific mortality rate documented in this study at 68.0 per 100000 population is much higher than any figure reported before.[8-10] Cancer is a real health problem in Basrah. It is a significant contributor to the toll of death (only second to cardiovascular diseases) and a major consumer of resources. Continuing research on cancer is vital but needs support from various interested partners. Improving the quality of diagnostic and therapeutic care seems an important alternative to improve cancer outcome. To close, we stress that cancer is a major cause of death in Basrah accounting for nearly 23.3% of all documented deaths during the survey.

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