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ABSTRACT In 2006 the Iranian national cancer registry reported that Kohgiluyeh and Boyer-Ahmad, a small province located in the southern part of the country, had a low incidence rate of almost all types of cancer. In a population-based cohort study, data on 660 cases of cancer in Kohgiluyeh and Boyer-Ahmad province were analysed after ICD codes had been rechecked and duplicates removed. Over the period 2007–2009 the annual average incidence rate of all cancers rose significantly by 53.0% and 115.1% in men and women respectively. Cancers of the prostate, thyroid, bladder and soft tissues decreased over the study period. Despite the recorded rise, the incidence rates for different sites of cancer (except for skin cancer) were significantly lower compared with their corresponding national rates for 2006. The results point to improvements in the cancer diagnosis and registry in the province, although real changes in cancer incidence over the period cannot be ruled out.

Augmentation apparente de l'incidence du cancer dans une petite province

de la République islamique d’Iran : étude de cohorte populationnelle

RÉSUMÉ En 2006, le registre national du cancer iranien signalait qu'une petite province située dans le sud du pays, Kohgiluyeh et Boyer-Ahmad, avait une faible incidence pour presque tous les types de cancer. Dans une étude de cohorte populationnelle, les données concernant 660 cas de cancer dans la province de Kohgiluyeh et Boyer-Ahmad ont été analysées après nouvelle vérification des codes CIM et élimination des doublons. Entre 2007 et 2009, l'incidence moyenne annuelle pour tous les cancers a significativement augmenté, de 53,0 % chez les hommes et de 115,1 % chez les femmes. En revanche, le nombre de cancers de la prostate, de la thyroïde, de la vessie et des tissus mous a diminué au cours de la période de l'étude. En dépit de l'augmentation enregistrée, les taux d'incidence pour les différents sites de cancer (à l'exception du cancer de la peau) étaient significativement inférieurs aux taux nationaux correspondants en 2006. Les résultats semblent indiquer des améliorations du diagnostic du cancer et de son enregistrement dans la province, même si de véritables changements dans l'incidence du cancer sur la période en question ne peuvent être exclus.

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Introduction

According to national cancer statistics in the Islamic Republic of Iran, cancer is the third cause of death in the country (1) and, based on the same source of data, the incidence of cancer appears to be rising (2,3). Cancer is therefore a serious health concern for the Iranian authorities and a proper and urgent response is required. The first crucial step in planning any national preventive and control programme is to develop an accurate and representative cancer monitoring and surveillance system to guide the prioritization of response (4,5). As in most other countries, the Islamic Republic of Iran has a national cancer registry (NCR) which is responsible for providing data on cases of cancer (6,7). The accuracy and completeness of the NCR data are considered crucial in research and interventions on cancer

The Iranian national health-care system essentially comprises 2 main sectors providing different levels of health and medical services under the supervision of the Iranian Ministry of Health and Medical Education (8). Primary health care, including vaccination, family planning and primary and general medical services, is provided free of charge or at low cost by the government for all rural and urban residents. Ideally, all Iranian citizens are registered and covered by this primary health-care network, especially for vaccination, child growth and development monitoring and maternal health services. Medical services, including medical diagnosis and treatment, are provided by the public and private sectors under the supervision of the Ministry of Health.

The Iranian NCR programme has been integrated into the Iranian national health-care system since 1984 and has been extended and improved continuously thereafter. In 1999, however, it was reported that the NCR was able to detect and record only 18% of expected cases. This figure improved dramatically to 81% in 2006 and since then the NCR has provided up-to-date and (arguably) representative epidemiological information on cancer at the national level (9). The improvements in the quality and completeness of the NCR database are due to the fact that NCR has become a part of the national health-care system and is fully supported by the Ministry of Health. Moreover, according to a bill passed by the Iranian Parliament, all private and public pathology and histology laboratories as well as hospitals are required to report all new cancer cases diagnosed and all cancer deaths to the NCR programme. In addition, according to the manual of the Iranian NCR programme, all cancer diagnoses need to be backed up with histology of biopsy specimens performed by pathology centres. Basic pathology and demographic information is extracted from the patients' files via a specially designed NCR data collection form. Although the pathology centres report cancer cases on a monthly base, provincial and national NCR offices take several years to complete the whole process of data collection, coding [based on International Classification of Diseases, version 9 (ICD 9) codes], entry and quality control. For example, a report on national cancer incidence and mortality for 2006 and details about the Iranian NCR programme were published in 2009 (1). As the NCR covers major sources of data on cancer throughout the country, it is generally believed that at the national level the programme detects as many cases of cancer as practically possible. The data provided by the NCR are therefore considered valuable and reliable for authorities and researchers who work on epidemiology and control of cancer (9).

An article published in 2009 and based on an official report from the Iranian NCR office showed that in 2006 Kohgiluyeh and Boyer-Ahmad province (K&B), a small province located in the southern part of the country, had a much lower incidence rate of almost all types of cancer compared with its neighbouring provinces and with national figures (1). Although certain environmental and social factors, including lower levels of environmental pollution and a more traditional lifestyle, may be used as justification for the lower incidence of specific types of cancer, the significantly lower incidence rates for all types of cancer in K&B were not easily justifiable. This study aimed to estimate the basic epidemiological indices of cancer in K&B for a 3-year period from year 2007 to 2009 using the same data sources and strategies as used by the NCR. This 3-year population-based cohort study estimated cancer incidence for the study

period and compared the findings with the results of the official report of the NCR for the year 2006 (1).

Methods

Data source

K&B is a small province located in the mid-south of the Islamic Republic of Iran with a population of about 630 000 (10). During the study period, the province had 7 pathology centres providing all pathology and histology tests throughout the province.

The data collection strategy for this study was similar to that of the NCR programme. Accordingly, from 2007 to 2009 the positive results of all pathology tests for cancer were collected from laboratory centres based in K&B province. The local cancer registry office normally takes about 2 years to collect and complete the required information from hospitals and laboratories. Therefore in 2012 all the registered cases during the study period were cross-checked for duplicates and only primary site cancers were retained in the data set for analysis. ICD codes were rechecked by an experienced coder to confirm the accuracy of the codes attached to the patient's information.

Study population

The study population was all cases reported to be residents of K&B at the time when pathology samples were taken. Information about the size and age and sex distribution of the K&B population during the study period was obtained from the official report of the Statistical Centre of Iran (10). Ethical approval for the study was obtained from the Yasuj University of Medical Sciences ethics committee.

Analysis

In order to avoid instability in the anatomical site-specific rates, sites with a small number of cases were merged as a group named "other". For the same reason, data for the whole study period (3 years) was divided by 3 to calculate the average annual incidence rate of cancer. Age-standardized rates (ASR) were used for comparing the local and national figures. Chi-squared and chi-squared for trend tests were used for statistical analysis of distribution and trend of cancer in the population. Analysis was done using Microsoft Excel.

Results

Over the 3 year study period (2007–09), 660 eligible cases of cancer were reported to the K&B

NCR provincial office. The average annual ASR of all cancers was 64.58 per 100 000. The average annual sex-specific ASR for the province were 74.95 per 100 000 and 45.85 per 100 000 for men and women respectively. This was a significantly higher risk of cancer in males compared with females (relative risk = 1.69, P Table 1).

These figures are significantly higher than the K&B provincial figures (50 per 100 000 and 39 per 100 000 for men and women respectively; P Figure 1). Accordingly, from 2007 to 2009 the annual incidence rate of cancer increased on average by 53.0% and 115.1% in men and women respectively ($P < 0.05$). However, as shown in