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Preliminary study of prevalence for bladder cancer in Isfahan Province, Iran

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Abstract *Objectives:* To clarify period prevalence (PP), incidence rate (Ir), and reported mortality for patients with bladder cancer (BC) in Isfahan Province/Iran, as BC is the most common cancer of the urinary tract in Iran and other parts of the world.

Patients and methods: Data from 21 March 2011 to 3 March 2015 was obtained from the Isfahan Cancer Registry. BC was distinguished by the related established topography code (C67). Ir and PP were calculated and expressed per 100 000 persons.

Results: In all, 279 females and 1376 males were identified. For the total population the PP was calculated as 33.2. This value corresponded to a PP of 54.4 for males and 11.4 for females ($P < 0.001$). Histologically, 63% of patients had invasive BC. Irs versus mortality rates were calculated for each year, i.e. 2011–2012, 2012–2013, 2013–2014, and 2014–2015, as 7.7 vs 0.56, 8.1 vs 0.74, 7.4 vs 0.98, and 9.9 vs 0.84, respectively. The mean (SD, range) age of the patients was 65.2 (13.9, 3–100) years. In relation to the age of the study population, BC occurred in 12% of patients aged < 50 years and in 15% of those aged ≥80 years.

Conclusion: The PP for BC in the male population was 4.8-times higher than females. There was a 28.6% increase in the Ir over the study period. Further study

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concerning environmental exposure, genetic factors, job-related exposure to various chemical carcinogens, and geographical distribution in Isfahan and its' rural provinces would seem to be valuable.

Introduction

Bladder cancer (BC) is the most common urinary tract cancer worldwide and its' incidence is rapidly increasing in underdeveloped countries [1,2]. About 2–6% of total malignant tumours are BC, which makes it the fourth most common cancer in males and eighth in females [3]. In the USA, BC prevalence in males is four-times that in females [4]. For the Iranian population with BC, a 2015 publication reported that the bladder was one of the most common malignancy sites amongst men in Iran, with BC ranking as the fifth most common with an age-specific incidence rate (Ir) of ∼11.2 per 100 000 males. Another epidemiological study for the years 2003–2008, confirmed a rise in the age-standardised Ir of BC in Iran [5,6].

Associated with the risk of BC, Hadkhale et al. [7] in 2016 provided an indication of the consequences of work-related contact to trichloroethylene, perchloroethylene, aromatic hydrocarbon solvents, benzene, and toluene. A study performed in an Iranian population with BC and controls, showed a higher risk to BC amongst bus and truck drivers, road construction workers, mechanics, refinery and petrochemical workers, plastic, metal manufacturing, welding, and pipeline workers [8].

Owing to the significant impact on healthcare cost because of the need for frequent and long-term cystoscopic examination, the main aim of the present investigation was to provide a preliminary survey of epidemiological data related to patients with BC in Isfahan Province/Iran.

Patients and methods

Ethical approval

This retrospective study was approved by the Institutional Review Board (No. 295115). The study was conducted at the Isfahan Kidney Transplantation Research Center (IKTRC). BC data from 21 March 2011 to 3 March 2015 were obtained from the Isfahan Cancer Registry, located at the Isfahan Deputy of Health. The Isfahan Cancer Programme is intended to record all cancer cases in the Isfahan. The management arm of the programme is the deputy of research in the Isfahan University of Medical Sciences.

Data analysis

The cancer sites studied were defined according to the International Classification of Diseases (ICD-O; third edition). BC was distinguished by the topography code C67. To clarify invasive or non-invasive neoplasms, the monography code was used for tumour description including cell type. Collected coded data were linked using the de-identified patients' name and surname. In the next step, the code for each patient, father's name, age, gender, pathology report and its' date, topography and monography code were recorded in Excel.

Statistical analysis

Microsoft Excel was used to arrange raw data before being inputted into the Statistical Package for Social Science (SPSS® version 20; IBM Corp., Armonk NY, USA) for analysis. Age, as a continuous variable, was expressed as mean ± standard deviation (SD). The normality distribution of age was tested using the Kolmogorov–Smirnov test. Variables such as gender, alive/dead, type of BC, year of report were expressed by frequency, percentage, period prevalence (PP) and Ir.

As the data were related to BC occurrence, therefore, normality distribution test of the patient population was studied only in comparisons associated with the age of males and females. In order to examine the differences between age and PP with gender the t-test and chi-squared test were used.

The total population of Isfahan City was obtained from the Isfahan/Program and Budget Management Organization. The PP was calculated as the proportion of the total cases over the period 2011–2015/to population at risk during the same period × 100 000. The Ir was calculated by dividing new cases of BC during a given time period/to the population at risk during the same time period × 100 000 [9–11].

Results

Demographic and epidemiology characteristic of patients with BC are shown in Table 1. There were 1655 recorded cases, in which 83% were males.

Normality distribution of age was tested by the Kolmogorov–Smirnov test. The mean (SD; range) age was 65.2 (13.9; 3–100) years. The mean age of patients was