

Pancreatic Cancer: Demographics and Prevalence

Abstract

Background: The rapidly fatal cancer that called pancreatic cancer (PC) is the seventh primary source of cancer connected deaths globally. Its treatment is a big challenge with a relatively poor survival even after surgery. The aim of this study was to provide information associated with the PC prevalence, period prevalence (PP), and incidence rates (Irs) in Isfahan Province/ Iran. **Materials and Methods:** Data from March 24, 2011 to March 19, 2015 were obtained from the Isfahan Cancer Registry. Irs and PP were calculated and expressed per 100,000 males. **Statistical Analysis Used:** The statistical analyses of d-Base were performed using Microsoft Excel and SPSS v. 20 (Chicago, IL, USA) for windows. **Results:** In all, there were 486 patients with PC. For the total population, the PP was calculated as 9.8 and Irs increased from 2.2 to 2.7/100,000 persons. The mean (standard deviation, min-max) age of the patients was 65.7 (13.0, 12–94) years. The total population was comprised of 150 alive and 336 deceased reported individuals. **Conclusions:** There was a 22.7% increase in the Irs over the study period. The PP was 58.9% higher in males than females. In 82%, PC occurred at the age between 40 and 80 years. Therefore, for the principal control of the disease, further consideration concerning etiology, pharmacotherapy, and recognizing all relevant features of the PC is crucial.

Keywords: Cancer, Iran, pancreas, pancreatic, prevalence

Introduction

The significant but uncommon public health problem with an enormously high mortality rate is called pancreatic cancer (PC).^[1] Based on GLOBOCAN, 2018 estimates, a total of 458,918 new cases with PC have been reported worldwide. The prediction for the year 2040 is an increase of 355,317 new cases. By increasing age, the incidence of PC is increasing in both sexes. Due to the report of PC in patients aged >70 years, it is defined as a disease of elderly populations. In the male population, PC is more common than the female population.^[2,3] As the 11th most common cancers, PC causes more than a quarter of a million deaths annually and is the seventh most frequent cause of death from cancer. As a tumor with the poorest survival, the mortality-to-incidence ratio is reported as 98%. With no metastasis to other organs, approximately 5-year survival could be achieved by resectional surgery in 20%. Although the cause of PC is multifaceted, cigarette smoking, alcohol consumption, chronic pancreatitis, obesity,

diabetes mellitus, and genetic features have been mentioned as the main factors.^[3-5]

For Europe, North America, and Oceania, the highest age-standardized rate (ASR) incidence was reported as 7.7, 7.6, and 6.4/100,000 people, respectively. Africa was reported the lowest ASR incidence of 2.2/100,000 persons. A 30-fold differences in ASR incidence were reported at the highest rate (Hungary; 10.8) and the lowest rate (Guinea; 0.35).^[2] Republic of Moldova (12.3) and Uruguay (12.1) were reported the highest mortality rate associated with men. In women, the United Arab Emirates (10.0) and Uruguay reported the highest mortality rate. The least mortality rate in men was reported in Tanzania (0.3) and Malawi (0.32) and in women in Guinea (0.2) and Pakistan (0.3).^[6,7]

In Iran, a recent publication confirmed that smoking, aging, and lifestyle changes are the most important risk factors for PC.^[8] Another study showed a gender difference between male and female with a higher mortality rate in males. The age of PC patients was reported 50 years or older.^[9] In addition, for the years 1999–2004, a 20%–30% of deaths from the PC were reported in Iran.^[10]

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The classification of PC is based on four types. When the cancer is limited to the pancreas and has grown around 2 cm, then called stage one. In stage two, there is local spread of tumor with growth of >2 cm and <4 cm. When the tumor is widely spread and tumor cell expanded to the nearby blood vessels or nerves, but no metastasized to distant site called stage three. In stage four, cancer has spread to distant organs.^[11-14]

Beside with advanced native and detailed approaches, there is a need for further investigation associated with the mortality tendency of PC because there is still no certain treatment. Therefore, this study aimed to provide period prevalence (PP) and incidence rates (Irs) data of PC in Isfahan Province, Iran.

Materials and Methods

PC data from March 2011 to March 2015 were obtained from the Isfahan Cancer Registry, located at the Isfahan Deputy of Health. The study was approved by the Institutional Review Board (extracted from the project with Code no. 295115). Demographic, clinical, and pathology data, with linkage to using of the de-identified patient name and surname, age and gender, final code for cancer diagnosis, and date of reported cancer were recorded in Microsoft Excel.

Statistical analysis

According to the International Classification of Diseases for Oncology (Third Edition), the cancer sites studied (C25) were defined. Microsoft Excel was used to arrange raw data before being inputted into the Statistical Package for the Social Science (SPSS® version 20; IBM Corp., Armonk, NY, USA) for analysis. Age, as a continuous variable, was expressed as mean \pm standard deviation (SD). The total population of Isfahan was obtained from the Isfahan/Program and Budget Management Organization. PP was calculated as the proportion of the total cases over the period of the years 2011–2015/to populations at risk during the same time period $\times 100,000$. The Irs were calculated by dividing new cases of cancer during a given time period/ to the population at risk during the same time period $\times 100,000$.^[15-21]

Results

Associated with the period of study, there were 486 patients with PC. For the total population, the PP was calculated as 9.8 which corresponded to a value of 7.5 for females and 11.9 for males/100,000 population. Figure 1 shows the distribution of age, according to gender. With a minimum of 12 and a maximum of 94, the mean age \pm SD was 65.7 ± 13.0 years. Ages related to PC from 10 to 40, 40–80, and 80–94 years of life in females versus males were as follows: 7, 34, and 25 (females) versus 12, 50, and 38 (males). Figure 2 shows the Irs for the related years of study. The calculated Irs for each year were as follows:

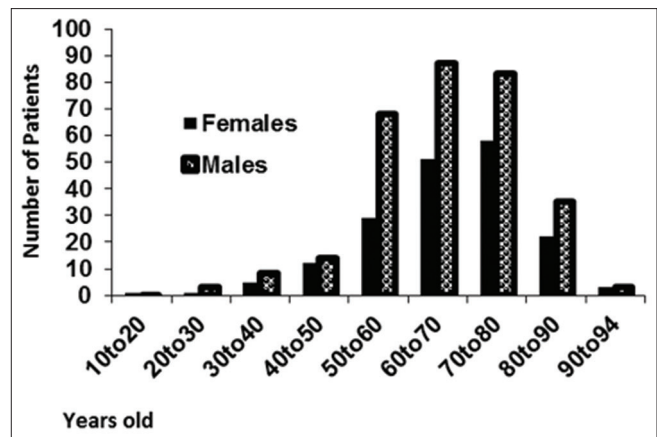


Figure 1: Distribution of age in pancreatic cancer

2 (2011–2012), 2.2 (2012–2013), 2.8 (2013–2014), and 2.7 (2014–2015), correspondingly. As shown in Figure 3, death reported data were associated with 336 records out of the total population ($n = 486$). One sample Kolmogorov–Smirnov test confirmed normal distribution of age among deceased patients ($P = 0.03$) with a mean \pm SD of 67.2 ± 13.3 years (ranged 12–94 years).

Discussion

The prevalence and incidence of PC differs significantly across regions and populations. Available reports indicate an increase in mortality in the United States, European countries, Japan, and China.^[22-24]

In addition to geographic variations and genetic differences^[25-28] and in agreement with previous publications, associated with the PC mortality,^[1-3] this investigation indicated a 69% mortality rate, with a 22.7% increase in the trend of PC incidence.

The PP of PC was 9.8 that corresponded to a value of 7.5 for females and 11.9 for males/100,000 persons in Isfahan Province/Iran. This is in agreement with previously published articles that confirmed ethnicity, male sex, cigarette smoking, daily diet based on a low amount of vegetables and fruits, high consumption of red meat, obesity, diabetes mellitus, and chronic pancreatitis have been mentioned as the main risk factors.^[8-10,29-31]

In this study, the mean age of patients was 65.7 years, and this is in agreement with previous publication that confirmed an age of >60 years as a risk factor for PC.^[22] Other publications confirmed that PC is rarely identified before 55 years of age, and it can be distinct as a disease of elderly populations, since the maximum occurrence is reported in people over 70 years.^[2,3,22] In this study, PC occurred at the ages between 10 and 50 years in 9% of the total population.

Previous publication reported 220,000 deaths annually for PC^[3] in which, among industrialized countries, mentioned as the fifth leading cause of death from cancer.^[23] In

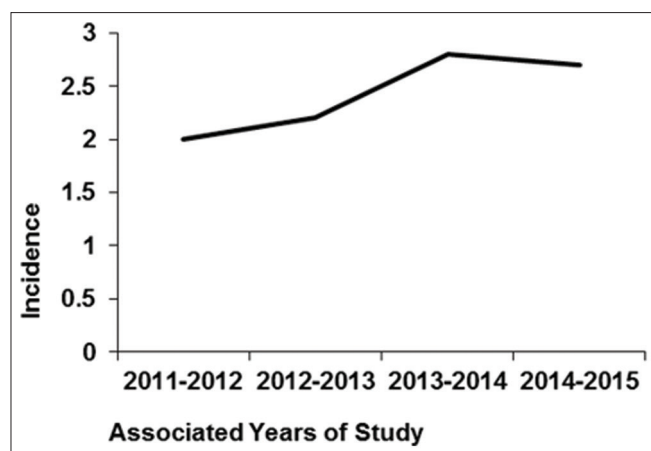


Figure 2: Incidence of pancreatic cancer

this study, dead/alive reported data were 69%, which is in agreement with previously published articles that mentioned PC as one of the most deadly common cancer types.^[22,23] Previous publication reported a higher mortality from PC in males when compared to females.^[24] In Isfahan Province/Iran, mortality from PC in both genders was 129/184 in females versus 207/302 in males. Regarding to sex, as similar as other studies, we found male and female differences in Ir (11.9 vs. 7.5) per 100,000 persons, respectively.

The burden of the PC is increasing, and based on the estimation of the International Agency for Research on Cancer, global PC rates tend to increase.^[31-34] Therefore, from this survey, plan for a change in strategy based on the prevention and early diagnosis, lifestyle changes, awareness campaigns, and advanced pharmacotherapy management recommended for health authorities and policymakers in Iran.

Conclusions

With a closer distance between the incidence and mortality rates, the worldwide problem, PC necessitates a comprehensive determination. Many risk factors have been identified as the cause of PC in patients.

In Isfahan Province/Iran, the PP associated with PC was with a value of 9.8/100,000 persons with a significant increase in the incidence from 2011 to 2015. These outcomes highlighted a greater effort toward advanced pharmacotherapy, prevention, and early diagnosis of PC in Iran.

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Nil.

Conflicts of interest

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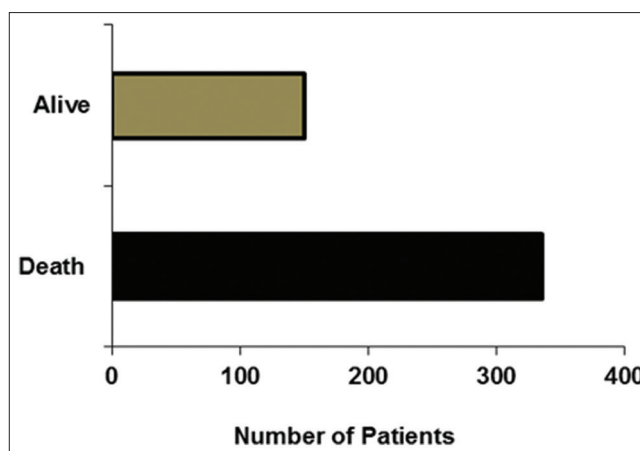


Figure 3: Death/alive reported data on pancreatic cancer

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