Prognosis of Pancreatic Cancer in Hamadan, Iran (2008-2018)

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ABSTRACT

Purpose: The present study aimed to determine the prognosis of pancreatic cancer from 2008 to 2018 in Hamadan, Iran.

Methods: A case series study was conducted retrospectively at Beheshti Hospital in Hamadan, Iran. A total of 409 cases that had been diagnosed with pancreatic cancer from 2008 to 2018 were assessed. The variables included age, gender, pathological type, location involved, early symptoms, metastasis, prognosis and treatments, was extracted from the files and recorded in checklist. Data were analyzed by using SPSS/20 software.

Results: The mean of age was 66.23 ± 13.06 year. The most frequent of pancreatic cancers was Adenocarcinomas (66.7%). The highest frequency of early symptoms was jaundice (53.1%) and weight loss (12.7%). The highest frequency of pancreatic cancer lesions was more in the head of pancreas (68.7%). Most patients had metastasis at the beginning of diagnosis (82.3%). Most metastases were in liver (31.5%) and peritoneum (25.2%). The prognosis of the pancreatic cancer is significantly related to the lesion location and the consumption of alcohol, cigarettes and substance abuse (p<0.05), but it wasn't correlated with age, sex and pathological type (p>0.05). The 1-year and 5-year survival rates were (22.3%) and (9.5%), respectively. The lowest and the highest in 5-year survival rate were (7.8%) and (18.8%) in adenocarcinoma and carcinoma type. More preventive considerations were found to be beneficial among this population.

Keywords: Prognosis; Metastasis; Pancreatic cancer; Iran

INTRODUCTION

Pancreatic cancer is the seventh leading cause of cancer-related deaths. Worldwide out of 458,918 pancreatic cancer patients and 432,242 related deaths were presented in 2018. As oppose to other cancers, the incidence of pancreatic cancer continues to increase, with little improvement in survival rates [1]. Worldwide, pancreatic cancer is the twelfth most common cancer in men, the eleventh most common cancer in women, and the seventh leading cause of cancer-related deaths. The incidence and mortality of pancreatic cancer is associated with increasing age, and men have slightly higher incidence rates than women [2]. The estimated 5-year survival rate for pancreatic cancer is less than 5% [3]. In the past decades, pancreatic cancer mortality has been increasing in both genders (for example, in the United States, European countries, Japan and China [3]. Cancer of the pancreas remains one of the most deadly common cancer types: the Mortality/Incidence ratio is 98% [4]. In Accordance with the American Cancer Society, the average lifetime cumulative risk of pancreatic cancer is approximately 1

in 64. Mortality and incidence of pancreatic cancer is increasing in Iran. Pancreatic cancer is more common in men than women. Pancreatic cancer depends largely on the lifestyle. Survival of pancreatic cancer is low in untreated patients [5-7]. In the study of Ahmedlo et al., from 1998 to 2008 reported the average survival time was 15 months, and 1- and 5-years survival was 54.5% and 27%, respectively [8]. The results of another study showed that age over 50, advanced stage of the disease, non-curable forms, and pathologic involved resection margin were associated with a worse survival [7]. Smoking, diabetes, obesity, and genetic basic were mentioned as risk factors. Twenty-five percent of cases were related to smoking and 5% to10% contributed to heredity [8,9]. Esmaili et al. in their study of avoidable deaths in Kerman concluded that out of 2197 deaths, 210 deaths were inevitable, but 1987 of them were evitable [10]. The present study aimed to determine Prognosis of pancreatic cancer from 2008 to 2018 at the Beheshti Hospital in

Hamadan, Iran.

MATERIALS AND METHODS

A case series study was conducted retrospectively at Beheshti Hospital in Hamadan city, Iran. A total of 409 cases of patients who had been diagnosed with pancreatic cancer from 2008 to 2016 and had a medical record were reviewed. The required information including age, gender, pathological type of cancer, location involved, the primary sign of presentation, prognosis and treatments, was extracted from the files and the checklist was completed. File deficiencies have been followed up by telephone.

Diagnosis of different types of pancreatic cancer was based on International Statistical Classification of Diseases and Related Health Problems 10th Revision (ICD-10) C25.0-C25.9 was adopted to identify "malignant neoplasm of pancreas" in the current study. ICD is the foundation for the identification of health trends and statistics globally, and the international standard for reporting diseases and health conditions. It is the diagnostic classification standard for all clinical and research purposes. Data processing and statistical analysis were performed by using SPSS/20 software and chi-square test. P value<0.05 was regarded as significant.

RESULTS

In this case-series study, 409 patients who referred to Beheshti Hospital in Hamadan, Iran from 2008 to 2018 following the diagnosis of pancreatic cancers were included. The mean and standard deviation of the age of the subjects was 66.23 ± 13.06 year. The minimum age of pancreatic cancers was 24 year and the maximum age was 96 year. There was a significant relationship between aging and the incidence of pancreatic cancers (P<0.05).

Pancreatic cancers were more common in men (60.1%). The number of 39 (9.5%) of the subjects were single and 370 (90.5%) of the subjects were married. The frequency of pancreatic cancers included Adenocarcinomas 273 (66.7%), Unknown 103 (25.2%), Mucinous Adenocarcinomas 17 (4.2%) and Carcinoma 16 (3.9%), respectively.

Pancreatic cancer has been increasing trend in terms of time (2008-2018). According to the results of Chi-square test, the highest frequency of early symptoms included jaundice (53.1%), weight loss (12.7%), upper abdominal pain (12.5%), nausea and vomiting (9.7%), Anorexia (9.3%) and sleep problems (2.9%), respectively. Also, there was no statistically significant relationship between the initial symptoms and the incidence in types of pancreatic cancers (P=0.42). The highest frequency of pancreatic cancer lesions was more in the head 281 (68.7%) and less in the body of the pancreas 128 (31.3%).

Based on the results of Chi-square test, most patients had metastasis at the beginning of diagnosis 337 (82.3%). Also, there was no statistically significant relationship between metastasis and types of pancreatic cancers (P>0.05).

As shown in Table 1, the highest rates of metastasis included liver (31.5%), peritoneum (25.2%), lung (12.2%), other areas such as bone and adrenal glands (7.09%) and lymph nodes (6.4%), respectively. Also, there was no statistically significant relationship between the site of metastasis and types of pancreatic cancers (P>0.05) (Table 1).

The prognosis of the pancreatic cancer is significantly related to the lesion location and the consumption of alcohol, cigarettes and substance abuse (p<0.05), but it wasn't correlated with age, sex and pathological type (p>0.05) (Table 2).

The 1-year and 5-year survival rates were 91 (22.3%) and 39 (9.5%), respectively. The lowest and the highest in 5-year survival rate were (7.8%) and (18.8%) in adenocarcinoma and carcinoma type, respectively (Table 3).

Table 1: Frequency of early symptom and metastasis in participants by units of research.

| Characteristics | Type of Pancreatic Cancer No. (%) (n=409) | | | | Total | P-Value* |
	Adenocarcinoma	Unknown	Carcinoma	Mucinous adenocarcinoma		
Early symptom						
Upper abdominal pain	16 (15.5)	33 (12.1)	2 (12.5)	0	51 (12.5)	
Loss of appetite	8 (7.8)	24 (8.8)	3 (18.8)	3 (17.6)	38 (9.3)	0.42
Sleep disorder	3 (2.9)	8 (2.9)	1 (6.2)	0	12 (2.9)	
Jaundice	50 (48.5)	149 (54.6)	6 (37.5)	12 (70.6)	217 (53.1)	
Weight loss	15 (14.6)	31 (11.4)	4 (25.0)	2 (11.8)	52 (12.7)	
Nausea and vomiting	11 (10.7)	28 (10.3)	0	0	52 (12.7)	
Metastasis						
Yes	82 (79.6)	226 (82.7)	15 (93.7)	14 (82.3)	337 (82.3)	0.12
No	21 (20.4)	47 (17.3)	1 (6.25)	3 (17.7)	72 (17.7)	
Metastasis site						
lymph node	8 (7.8)	18 (6.6)	0	0	26 (6.4)	
peritoneum	30 (29.1)	70 (25.6)	3 (18.75)	0	103 (25.2)	
Liver	30 (29.1)	84 (30.8)	8 (50.0)	7 (41.1)	129 (31.5)	0.06
Lung	12 (11.7)	32 (11.7)	4 (25.0)	2 (11.7)	50 (12.2)	
Other site	2 (1.9)	22 (8.05)	0	5 (29.4)	29 (7.09)	
No Metastasis	21 (20.4)	47 (17.3)	1 (6.25)	3 (17.7)	72 (17.7)	
Total	103 (100.0)	273 (100.0)	16 (100.0)	17 (100.0)	409 (100.0)	

Table 2: Frequency distribution of mortality (prognosis) of pancreatic cancer based on some parameters.

Variables		Mortality (prognosis), No.(%) (n=409)		P-Value	Total
		More than 1 year	Less than 1 year		
Age	<60	11 (9.1)	111 (90.9)	122 (29.8)	0.31
	≥ 60	28 (9.8)	259 (90.2)	278 (70.2)	
Gender	male	23 (9.4)	223 (90.6)	246 (60.1)	0.96
	female	16 (9.9)	147 (90.1)	163 (39.9)	
Pathologic type	Adenocarcinoma	8 (7.8)	95 (92.2)	103 (25.3)	0.13
	Carcinoma	3 (18.8)	11 (81.2)	16 (3.9)	
	Mucinousn Adenocarcinoma	3 (17.7)	14 (82.3)	3 (4.2)	
	Unknown	25 (9.2)	248 (90.8)	25 (66.7)	
Lesion in pancreas	head	1 (0.8)	127 (99.2)	128 (31.3)	0.001
	Body	38 (13.6)	243 (86.4)	281 (68.7)	
Smoking	yes	5 (3.6)	136 (96.4)	141 (34.5)	0.01
	no	39 (14.6)	229 (85.4)	268 (65.5)	
Alcohol consumption	yes	5 (4.9)	97 (95.1)	102 (24.9)	0.02
	no	38 (12.8)	268 (87.2)	307 (75.1)	
Substance abuse	yes	5 (4.9)	98 (95.1)	103 (25.2)	0.03
	no	39 (12.7)	267 (87.2)	306 (74.8)	
Total		409 (100.0)	39 (9.6)	370 (90.4)	

Table 3: Frequency distribution of survival rate in studied patients.

Survival rate (Yr)	Type of Pancreatic cancer (n=409)				Total
	Adenocarcinoma	Unknown	Carcinoma	Mucinous Adenocarcinoma	
	Number (percent)	Number (percent)	Number (percent)	Number (percent)	Number (percent)
91 (22.3)	4 (23.5)	6 (37.5)	60 (21.9)	21 (20.4)	1
39 (9.5)	3 (17.6)	3 (18.8)	25 (9.2)	8 (7.8)	5

DISCUSSION

Based on the results of this study, pancreatic cancer has been increasing trend during 2008 to 2018. The mean and standard deviation of the age of the subjects was 66.23 ± 13.06 year. The minimum age of patients was 24year and the maximum age was 96 year. Pancreatic cancers were more common in men than women. The most frequent of pancreatic cancers included Adenocarcinomas. The highest frequency of pancreatic cancer lesions was more in the head of pancreas. Most patients had metastasis at the beginning of diagnosis. The highest rates of metastasis included liver and peritoneum. The prognosis of the pancreatic cancer was significantly related to the lesion location and the consumption of alcohol, cigarettes and substance abuse.

Cancer of the pancreas in Iran is the cancer of the elderly people, but at the time of diagnosis, patients are younger than patients in Western countries, which show that genetic base, familial marriage and environmental factors can role in the progression of pancreatic cancer [6]. The dietary effect has not been proven in preventing pancreatic cancer in any of the diets. While fruits and vegetables appear to have a protective effect on the prevention of pancreatic cancer, the results in this regard are incompatible in the Iranian population [11]. Tobacco, smoking and drinking alcohol are related with an increased risk of pancreatic cancer, which is raised to the incidence of pancreatic cancer [12]. Moossavi et al., have shown that, contrary to smoking, narcotics use is a risk factor for pancreatic cancer and would grow the risk of pancreatic cancer [13]. The present study revealed that prognosis of the pancreatic cancer was significantly related to the lesion location and the

consumption of alcohol, cigarettes and substance abuse.

In a review study in 2019 concluded that the most common type of pancreatic cancer is adenocarcinoma, which accounts for about 85% of cases and has a lower prognosis than other types of pancreatic cancer [14]. Among the pathologically diagnosed types, there were most of diagnosed cases of adenocarcinoma and the lowest survival rate was in adenocarcinoma type (7.8%), which is consistent with the findings of this study. The incidence and mortality rate of pancreatic cancer is steadily increasing with age. Actually, men are more likely to develop this carcinoma than women. Smoking, aging, and lifestyle changes are the most important risk factors for pancreatic cancer in Iran. Due to the lack of initial symptoms or a specific marker for early diagnosis of pancreatic cancer, this cancer is detected lately and therefore low survival rate is observed [6]. This is compatible with the results of this study.

Guigan et al. in a review revealed that the pancreatic cancer was usually given in advanced stages, which makes the 5-year survival of patients about 2%-9% and has a lower prognosis among other cancers. Patients with family risk factors are 9 times more likely to develop this disease [15]. In the present study, the prognosis was low and in 9.5%, which is consistent with the above study. The highest incidence and mortality rates of pancreatic cancer were found in developed countries. The estimated 5-year survival rate for pancreatic cancer is about 5% [16]. Another study showed that during the years of 1998 to 2008, the medium survival time was 15 months, and 1-and 5years survival was 54.5 and 27%, respectively [8]. Hadizadeh et al., also concluded in 2014 that the prognosis of pancreatic cancer was very weak in not cured

patients [9]. This survey was consistent with finding the present study. A wide range of pancreatic tumors (85% to 90%) include adenocarcinoma [15]. Pancreatic cancer has the worst prognosis among cancers [10]. Diagnosis of this disease is difficult because it locates in an inaccessible area in the abdominal cavity and leads to the identification of the disease in advanced stages [8]. There is no early screening and diagnostic method for this cancer [8].

CONCLUSION

The most frequent of pancreatic cancers was Adenocarcinomas. The highest frequency of early symptoms included jaundice and weight loss. Most patients had metastasis at the beginning of diagnosis. The prognosis of the pancreatic cancer is significantly related to the lesion location and the consumption of alcohol, cigarettes and substance abuse. More preventive considerations were found to be beneficial among this population.

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AVAILABILITY OF DATA AND MATERIAL

All the data was collected from original patient's files.

COMPLIANCE WITH ETHICAL STANDARDS

This article does not contain any studies with human participants or animals performed by any of the authors.

CONFLICT-OF-INTEREST STATEMENT

No potential conflicts of interest.

ETHICS APPROVAL

This research is based on the Medical Doctoral Thesis approved by Research Deputy of Hamadan University of Medical Sciences with Project No. 9809126662. The ID Code of Ethics Committee was IR.UMSHA.REC.1398.660.

CONSENT TO PARTICIPATE

This article does not contain any studies with human participants or animals performed by any of the authors.

CONSENT FOR PUBLICATION

There is a covering letter for this manuscript.

AUTHOR CONTRIBUTIONS

Saman Nazari conceived the idea, planned the study and drafted the manuscript. All authors helped acquisition of data, did statistical analysis, editing and final approval of manuscript. All authors contributed significantly to the submitted manuscript.

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REFERENCES

1. Khalaf N, El-Serag HB, Abrams HR, Thrift AP. Burden of pancreatic cancer: from epidemiology to practice. Clin Gastroenterol Hepatol. 2021;19(5):876-884.

2. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. Ca-Cancer J Clin. 2018;68(6):394-424.

3. Ilic M, Ilic I. Epidemiology of pancreatic cancer. World J Gastroenterol. 2016;22(44):9694-9705.

4. Butler J, Foot C, Bomb M, Hiom S, Coleman M, Bryant H, et al. The international cancer benchmarking partnership: an international collaboration to inform cancer policy in Australia, Canada, Denmark, Norway, Sweden and the United Kingdom. Health Policy. 2013;112(1-2):148-155.

5. Siri FH, Salehiniya H. Pancreatic cancer in Iran: an epidemiological review. J Gastrointest Cancer. 2020;51(2):418-424.

6. Shobeiri F, Afshari KD, Nazari S, Nazari S, Farhadian M. Effect of nutritional program on nutritional behavior in pregnant women at Hamadan, Iran. J Postgrad Med Inst. 2018;32(4).

7. Ahmadloo N, Bidouei F, Omidvari S, Ansari M, Mosalaei A, Mohammadianpanah M. Pancreatic cancer in southern Iran.

8. Hadizadeh M, Padashi M, Alizadeh AH, Zali MR. Clinical, laboratory biomarkers and imaging findings of pancreatic adenocarcinoma in Iran. Asian Pac J Cancer Prev. 2014;15(10):4349-4352.

9. Pourshams A, Kazemi B, Kalantari S. A review of the etiology and biomarkers of pancreatic cancer, with emphasis on the role of diabetes. Tehran Univ Medical J. 2018;75(11):773-778.

10. Amiresmaili M, Khanjani N, Moghadam MN, Isfahani P. Study of the avoidable mortality in Iran: Kerman Province. Iran Red Crescent Med J. 2013;15(4):345-349.

11. Ghorbani Z, Hekmatdoost A, Poustchi H, Pourshams A, Malekshah AF, Sharafkhah M, et al. The association between dietary carbohydrate intake and pancreatic cancer risk: a large prospective study. Govaresh. 2016;21(3):167-174.

12. Shakeri R, Kamangar F, Mohamadnejad M, Tabrizi R, Zamani F, Mohamadkhani A, et al. Opium use, cigarette smoking, and alcohol consumption in relation to pancreatic cancer. Med. 2016;95(28):e3922.

13. Moossavi S, Mohamadnejad M, Pourshams A, Poustchi H, Islami F, Sharafkhah M, et al. Opium use and risk of pancreatic cancer: a prospective cohort study. Cancer Epidemiol Biomark Prev. 2018;27(3):268-273.

14. Rawla P, Sunkara T, Gaduputi V. Epidemiology of pancreatic cancer: global trends, etiology and risk factors. World J Oncol. 2019;10(1):10-27.

15. McGuigan A, Kelly P, Turkington RC, Jones C, Coleman HG, McCain RS. Pancreatic cancer: A review of clinical diagnosis, epidemiology, treatment and outcomes. World J Gastroenterol. 2018;24(43):4846.

16. Huang J, Lok V, Ngai CH, Zhang L, Yuan J, Lao XQ, et al. Worldwide burden of, risk factors for, and trends in pancreatic cancer. Gastroenterology. 2021;160(3):744-754.