

Frequency distribution and ten-year survival rate of patients with different malignant liver lesions in Iran

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ABSTRACT

Liver cancer is the second leading cause of cancer death among men and women and the fifth most common cancer in men and the ninth most common cancer in women. The major cause of the lower survival rate in such patients is the difficulty in early diagnosis; most patients with liver cancer are diagnosed at an advanced stage. This study aimed to determine the frequency distribution of malignant liver lesions in terms of age and sex and ten-year survival rate (2005-2015) referred to the health centers of Yazd province, Iran. The present descriptive study was conducted among patients referred to health centers of Yazd province who were screened for diagnosis of malignant liver lesions. First, demographic information and patients' profiles, including the pathology of lesion and survival rate, were extracted from the medical records, and then analyzed by statistical tests. The study examined 80 patients with liver malignant, including 48 (68%) men and 32 (40%) women. The mean age of the samples was 70.57 ± 12.36 years with a range of 28 to 88 years. The overall survival rate of patients was 10.77 ± 1.62 years (SE \pm Mean) and 95% survival was from 7.6 to 13.9 months. Also, 12.5% of patients had underlying malignancy. Based on this study, no significant association was found between age, sex, underlying disease, and frequency distribution of liver malignancies. There was also no significant association between age, sex, underlying disease, and survival rate in patients with liver malignancy.

Keywords: Neoplasms, Survival rate, Liver neoplasm, Malignant liver lesions

Introduction

Liver cancer is the second leading cause of cancer deaths for men and women and the fifth most common cancer among men and the ninth most common cancer among women [1]. The survival rate of patients has improved with the advancement of new therapies such as chemotherapy, liver transplantation, and liver resection [2]. However, the five-year survival rate for patients

with liver cancer is 18%, which is lower than other cancers [3]. Among all cancers in China, liver cancer has the lowest survival rate [4]. The major cause of the lower survival rate in these patients is the problem of early diagnosis, and most patients with liver cancer are diagnosed at an advanced stage [5-7]. These tumors are sometimes asymptomatic and sometimes with various symptoms, such as abdominal pain, hepatomegaly, and weight loss. Sometimes tumors are accidentally detected [8]. Also, it is difficult to treat advanced liver cancer due to the low selective effects and toxicity of chemotherapy drugs [5-7]. Recent reports from North America, Europe, and Japan have shown an increase in the incidence rate of hepatocellular carcinoma (HCC), the most common type of liver cancer histology [9]. The number of Americans who die annually is slowly rising due to liver cancer in recent decades [10]. According to the annual report (2015), the rate of death from most cancers except liver cancer has declined in the United States between 2003 and 2012 among

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men and women of all racial and ethnic groups [11]. The risk of liver cancer in American men is two times higher than that of American women [12]. Also, excessive alcohol consumption, obesity, rare metabolic disorders, Type II diabetes, and non-alcoholic fatty liver disease are other known risk factors for liver cancer [13]. In developed countries, liver metastases account for 20% of the early malignancies, due to the blood filtration of organs and tissues of the body by the liver and, consequently, the availability of malignant cells. The primary malignant tumors of the colon, stomach, pancreas, rectum, esophagus, breast, lung, and skin are the most likely liver metastases, and even the first signs of malignancy appear in the liver in many of these cases [14, 15]. Each of these tumors has different etiologies. For example, hepatic adenoma is associated with the use of contraceptive pills [11].

Objectives

Considering the numerous but not comprehensive clinical and pathological studies on hepatic tumors, the need of different countries to use these studies for treatment orientation, and according to reports on changes in the incidence of liver masses and different types in various countries, the current study was conducted with a comprehensive approach to the clinicopathologic examination of liver biopsies referred to hospitals in Yazd province during the years 2005 -2015 to assess the association between age, sex and pathology with the frequency of benign and malignant tumors to make decisions faster and accurate, and so helping guide patients and physicians before definite diagnosis.

Materials and Methods

The current descriptive study was carried out among patients referring to medical centers of Yazd province with a diagnosis of malignant liver lesions. In this study, 80 liver biopsies were selected from individuals who had liver samples during the years 2005-2015. Promptly, this study was conducted in the first half of 2018 at the medical centers of Yazd province.

To enroll the samples to study, the pathology section archival information was first searched for all samples related to malignant tumors during the exploration of 501,233 sheets, and the pathological profile of patients with liver samples was recorded in the questionnaire. Then, by tracking the files and records of patients, we went to the main archives of hospitals in Yazd province to record the required information, including age, sex, type of malignancy, and ultimately survival rate in the pre-designed questionnaire. Exclusion criteria were the samples with incomplete records. Finally, 80 patients were randomly used for statistical analysis.

Statistical analysis

Data were analyzed by SPSS version 17 (IBM, USA) after obtaining information from the patient records, analyzed by Chi-

Square and Log-Rank test. The results were presented as tables and indicators for the discussion and conclusion.

Results and Discussion

The study looked at 80 samples of biopsy from patients with liver malignancies. **Table 1** shows the frequency distribution of liver malignancies in the samples of this study.

Table 1. Frequency distribution of liver malignancies in the samples of this study

Type of pathology	Frequency	Percentage
Metastatic adenocarcinoma	55	68.8
Hepatocellular carcinoma	13	16.3
Other *	12	15
Total	80	100

* Other includes Carcinoid tumor-PENET-Noroendocrin carcinoma-lymphoma-squamous cell carcinoma.

The types of malignancy were also categorized according to sex. The information for this classification is shown in **Table 2**. The association between sex and types of malignancy was investigated by the Chi-Square test and there was no significant association (P-value = 0.393). Therefore, the prevalence of malignancy in this study did not differ between men and women.

The frequency distribution of malignant lesions was also analyzed in terms of age. This association was evaluated by the Chi-Square test and P-value = 1 reported no association between the age group and the frequency of lesions.

According to **Table 2**, 100% of patients with underlying disease had metastatic adenocarcinoma. Among patients without underlying disease, 64.3% had metastatic adenocarcinoma, 18.6% had hepatocellular carcinoma and 17.1% had other forms of liver malignancy. This association was evaluated by the Chi-Square test and was not significant (P-value=0.089).

Table 2. Frequency distribution of different liver malignancies

Type of malignancy	Metastatic adenocarcinoma		Hepatocellular carcinoma		Other *		Total	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
Frequency distribution of liver malignancy in terms of sex (P-value = 0.393)								
Male	31	64.6	10	20	7	14.6	48	100
Female	24	75	3	9.4	5	15.6	32	100
Total	55	68.5	13	16.3	12	15	80	100
Frequency distribution of malignant liver lesions in terms of age (P-value =1)								
28-49	9	69.2	2	15.4	2	15.4	13	100
50-88	46	68.7	11	16.4	10	14.9	67	100
Total	55	68.8	13	16.2	12	15	80	100

Frequency distribution of malignant liver lesions in terms of the underlying disease (P-value =0.089)								
Yes	10	100	0	0	0	0	10	100
No	45	64.3	13	18.6	12	17.1	70	100
Total	55	68.8	13	16.3	12	15	80	100

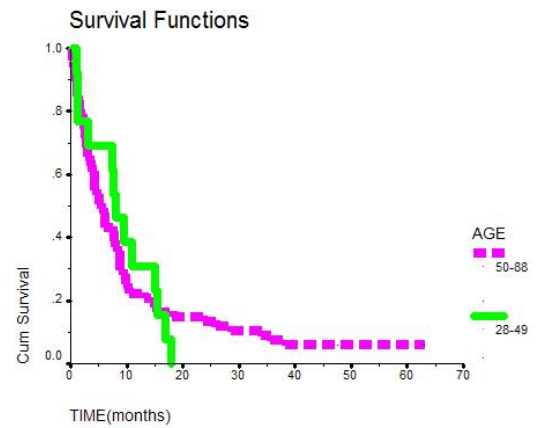
* Other includes Carcinoid tumor-PENET-Noroendocrin carcinoma-lymphoma-squamous cell carcinoma.

Table 3 shows the analysis of the mean survival rate of patients in terms of sex. In this study, the mean survival rate was 7.97 months in males and 14.5 months in females. This difference was evaluated by the Log-Rank test (P-Value =0.0692). Therefore, there was no association between survival rate and sex in this study. Although in terms of number, the survival rate of women is higher than that of men, this difference was not statistically significant.

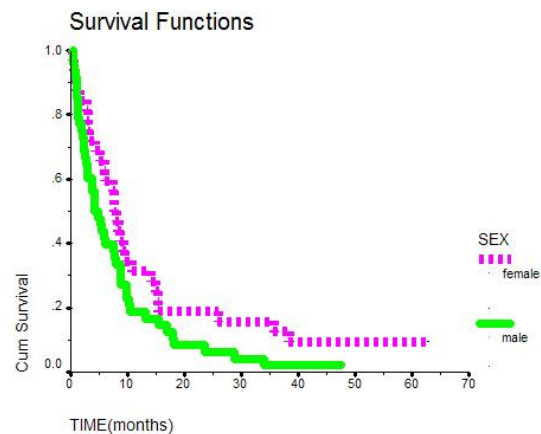
The mortality data were analyzed in malignant patients. In **Figure 1**, the right diagram shows that the likelihood of death is high in the liver malignancies of both sexes in the first 15 months of life, and the likelihood of death is lower after 15 months. In **Figure 1**, the left diagram shows that all specimens have died in the age group of 28-49 years before the 18th month after involvement, but the survival rate of patients in the age group of 50-88 is initially decreasing, but not less than 10%. **Table 3** showed that the related mean survival rate in terms of age was 8.86 months at the age of 28-49 years and 11.14 months at the age of 50-88 years. This difference was evaluated by the log-rank test, in which there was no association between age groups and mean survival rate in this study (P-value = 0.969).

Table 3. Information on survival rate for patients with liver malignancies

Variables	Sample size	Mean survival rate	SE	Frequency of death	Percentage of death
Frequency distribution of liver malignancy in terms of sex (P-value = 0.0692)					
Male	48	7.97	1.35	47	98
Female	32	14.5	3.18	29	90.7
Total	80	10.77	1.62	76	95
Frequency distribution of malignant liver lesions in terms of age (P-value =0.969)					
28-49	13	8.86	1.69	13	100
50-88	67	11.14	1.9	63	94
Total	80	10.77	1.62	76	95
Frequency distribution of malignant liver lesions in terms of the underlying disease (P-value =0.969)					
Yes	70	10.88	1.66	67	95.7
No	10	8.49	4.21	9	90
Total	80	10.77	1.62	76	95



a)



b)

Figure 1. Patient survival charts. a) The survival rate of patients with liver malignancies in terms of sex. b) The survival rate of patients with liver malignancies in terms of age

According to **Table 4**, an examination of samples in terms of pathologic reports showed that the mean survival rate of individuals was 9.79 months in metastatic adenocarcinoma, 11.48 months in hepatocellular carcinoma, and 14.5 months in other liver malignancies. This difference was evaluated by the log-rank test, and the mean survival rate showed no difference in terms of pathologic lesions in this study (P-value = 0.491). In **Figure 2**, the left diagram shows that the survival rate of patients did not differ in terms of the type of pathology between patients with liver malignancies.

In **Table 3** related to the mean survival rate of patients with liver malignancies in terms of the underlying disease, the mean survival rate was 8.49 months in patients with liver malignancy associated with underlying disease and 10.88 months in subjects with liver malignancy without underlying disease. This difference was analyzed by the log-rank test and it was found that there was no significant difference in the mean survival rate between the presence or absence of the underlying disease (P-value = 0.543). In **Figure 2**, the left diagram shows that the patients with liver malignancies associated with the underlying disease showed a decrease in survival rate up to ten months, then relatively constant. In patients with liver malignancy without underlying

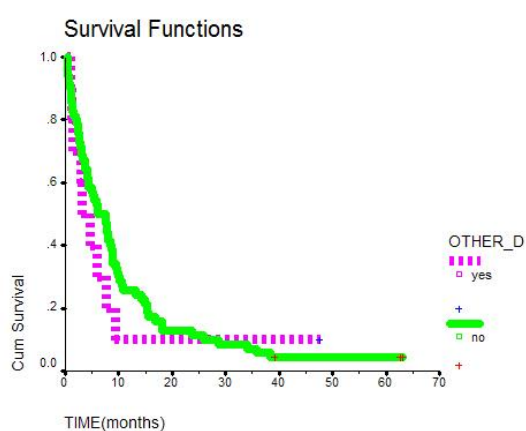
disease, the survival rate falls to 18 months, and then changes are low.

Table 4. Mean samples in terms of the type of pathology

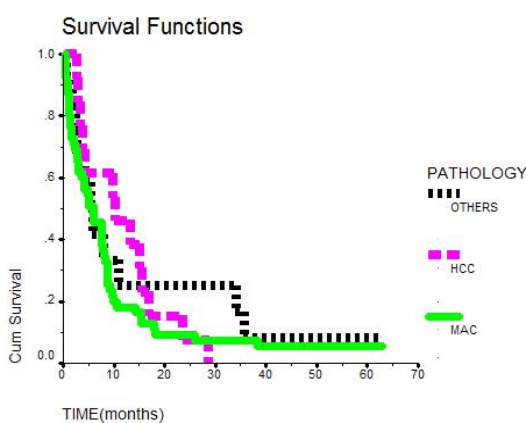
Age	Sample size	Mean survival rate	SE	Frequency of death	Percentage of death
Metastatic adenocarcinoma	55	9.79	1.95	52	94.5
Hepatocellular carcinoma	13	11.48	2.32	13	100
Other *	12	14.5	5.3	11	91.6
Total	80	10.77	1.62	76	95

P value=0.491

* Other includes Carcinoid tumor-PENET-Noroendocrin carcinoma-lymphoma-squamous cell carcinoma.



a)



b)

Figure 2. Mean survival rate of the study patients. a) The survival rate of patients with liver malignancies in terms of the underlying disease. b) The survival rate of patients with liver malignancies in terms of the type of malignancy

Liver diseases include different categories, one of which is the nodules and liver tumors. The liver tumors or neoplasms are divided into benign and malignant tumors. The malignancies also branch out to primary malignant and secondary malignant or metastatic tumors. Each of the benign and malignant nodules and tumors has a variety of clinical features and pathologies [8]. The malignancies also branch out to primary malignant and secondary malignant or metastatic tumors. Each of the benign and

malignant nodules and tumors has a variety of clinical features and pathologies [8].

In a study on 13939 patients with primary liver cancer in England between 1998 and 2007, the mean age of patients was 70 years [16]. In our study, the mean age of the samples was 70.57 ± 12.36 with a range of 28-88 years. In research on primary cancers, F.Xavier Bosch *et al.* (2004) stated that liver cancer begins before the age of 20 years in countries with high prevalence, and it is rare before the age of 20 years in countries with a low prevalence [17]. A comparison of the present study and the mentioned study suggests similarity at the onset of liver cancer in countries with a low prevalence.

In a study by Lao Xiang-Ming *et al.* (2007) on five cases of liver carcinoma, the ages of patients varied between 40 and 68 years [18]. The reason for the difference between this article and our research is the specificity of the malignant tumor in the aforementioned research, but the mean age of malignant tumors in the present study is similar to that of the age group in other studies. In a study of MacSween RN in 1974 on different types of necropsy, the prevalence of primary malignant tumors was 4.4% and 17.5% in women and men, respectively, between 1900 and 1969; it was more prevalent in men [19]. In the present study, the males account for the majority of malignant tumors (60%). In the study of F. Xavier Bosch *et al.* (2004), the prevalence rate of liver cancer in men was 2 to 4 times higher than that of women [16], which is consistent with this study in terms of age preference.

Conclusion

Based on the findings of this study, the mean age of the samples was 70.57 ± 12.36 years with a range of 28 to 88 years. The overall survival rate of patients was 10.77 ± 1.62 years (SE \pm Mean) and 95% survival was from 7.6 to 13.9 months. Based on this study, no significant association was found between age, sex, underlying disease, and frequency distribution of liver malignancies. There was also no significant association between age, sex, underlying disease, and survival rate in patients with liver malignancy.

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