

## Incidence and Epidemiology of Urologic Cancers in North of Iran

### Abstract

**Introduction:** Urinary system malignancies are considered as one of the main public health concerns with high morbidity and mortality. These cancers have various patterns in different regions over time. This study aims to determine the incidence of these malignancies in the northern part of Iran (Mazandaran Province). **Materials and Methods:** This cross-sectional study carried out among patients with urologic cancers in 2014. A population-based cancer registry in Mazandaran University of Medical Sciences was the source of information. Stata software version 14 was applied for descriptive statistics and analysis. The WHO standard population was used for estimating the age and sex-standardized incidence of urologic cancers. **Results:** In 2014, 261 patients with cancers of the urinary system have been registered in Mazandaran Province, northern Iran. Mean, standard deviation, minimum, and maximum age of patients were 64.4, 15.6, 1, and 94, respectively. More than two-thirds of patients aged over 60 and most of them were male. The standardized incidence of cancers of the bladder, kidney, ureter, and other parts of the urinary system among men was estimated as 7.98, 1.54, 0.05, and 0.3 per 100,000, respectively. The standardized incidence of cancers of the bladder, kidney, pelvis, and ureter among women were 0.09, 0.14, 0.09, and 0.39, respectively. **Conclusion:** The majority of urologic cancers in the northern part of Iran are among men and those aged over 60. Moreover, bladder and renal cancers are the most common cancers in both genders.

**Keywords:** Bladder, kidney, neoplasia, urinary system

### Introduction

Cancer is defined as the rapid growth of abnormal cells which is one of the main causes of death in developing and developed countries.<sup>[1]</sup> Although cancer incidence may be lower in developing countries than in developed countries, the current increasing trend shows that it is expected to be similar in all countries in the future.<sup>[2,3]</sup> Such condition is because the inappropriate lifestyle, population aging, and the increasing life expectancy.<sup>[1]</sup>

Malignancies of the urinary system are a major public health problem responsible for considerable mortalities. The pattern of cancer incidence is varied regarding different places, times, and ethnicities. Epidemiologic studies have shown that these malignancies are more common among western communities than the Asian countries.<sup>[4]</sup> Such regional differences in the incidence of cancer are due to different risk factors such as obesity, hypertension, smoking, inappropriate physical

examination, environmental, occupational, and genetic factors.<sup>[4-8]</sup> The global incidence and mortality of the urologic cancers in 2012 have been estimated as 14.1 million and 8.2 million, respectively. Renal and bladder cancers are responsible for 2.4% and 3.1% of all malignancies in the world. The corresponding standardized incidences are 4.4 and 5.3 per 100,000 population, respectively.<sup>[9]</sup>

Population-based cancer registry is a comprehensive method providing required information for planning and evaluating cancer control program.<sup>[10]</sup> Designing epidemiologic studies and knowledge promotion regarding the burden of cancer can help to evaluate cancer control program as well as the screening programs.<sup>[4]</sup> Although many studies have been carried out in this field, considerable heterogeneities and epidemiological differences between and within countries should be taken into consideration.<sup>[11]</sup> Therefore, there is a significant variation in the distribution of diseases in different regions inside a country as well as between countries indicating the need for investigating the

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Access this article online

Website: [www.cci-j-online.org](http://www.cci-j-online.org)

DOI: 10.4103/ccij.cci\_j\_52\_18

Quick Response Code:



**How to cite this article:** Janbabaee G, Ashrafi MY, Ghazizadeh Z, Afshari M, Mousavi RS, Jouybari ME, et al. Incidence and epidemiology of urologic cancers in North of Iran. Clin Cancer Investig J 2018;7:217-20.

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incidence of urinary system cancers based on geographical areas. This study aims to estimate the incidence of urologic cancers in Mazandaran Province in the north of Iran.

## Materials and Methods

The study population of this cross-sectional study was patients with cancers of the urinary system registered in the population-based cancer registry system of Mazandaran University of Medical Sciences.

The information of this registry was reports of all hospitals, pathologic laboratories, and all insurance companies. The variables extracted from the registry were the age at diagnosis, gender, tumor grading, residence area, diagnostic methods, and cancer behavior.

Data were described using percent frequency, mean, standard deviation, minimum, and maximum. To estimate the age- and sex-standardized incidence of the urologic cancers, the number of cases in each age and sex group was divided by the population size of the same group and adjusted based on the WHO standard population. The population size of each age and sex group was provided from the National Statistics Center. The frequency of demographic and clinical factors between different urologic cancers was compared using Chi-square test.  $P < 0.05$  was considered statistically significant. All data analyses were carried out using Stata software version 14 (StataCorp LP, College Station, Texas, USA).

## Results

During 2014, 261 cases with urologic cancers in the north of Iran (Mazandaran Province) were registered. Mean, standard deviation, minimum, and maximum age of patients were 64.4, 15.6, 1, and 94, respectively. Among them, 66.3% aged over 60% and 1.9% were under 15 years. Most of the patients with urologic cancers were male. Of them, 40.2% were urban residents and 28.7% were rural residents. The residence area for 31% was unknown [Table 1].

Of 261 cases with urologic cancers, frequency of renal, bladder, pelvis, and ureter were 45 (17.2%), 202 (77.4%), 1 (0.38%), and 3 (1.15%), respectively. The frequency of unknown cases was 10 (3.8%). The standardized incidence of urinary system cancers among all population, men, and women were estimated as of 2.46/100,000, 9.88/100,000, and 1.69/100,000, respectively. The standardized incidence of renal cancer, pelvis cancer, ureter cancer, and also cancers of the other parts of the urinary system among all population was estimated as of 0.07/100,000, 0.05/100,000, 0.05/100,000, 0.13/100,000, and 0.12/100,000, respectively. Moreover, the standardized incidence of bladder cancer, renal cancer, ureter cancer, and cancers of the other parts of the urinary system among men was estimated as 7.98/100,000, 1.54/100,000, 0.05/100,000, and 0.3/100,000, respectively. The corresponding incidences for women were estimated

as 0.09/100,000, 0.14/100,000, 0.09/100,000, and 0.39/100,000, respectively.

Table 2 shows that the mean age of patients with bladder cancer was significantly higher than that of patients with renal cancer (66.3 vs. 61.27, respectively,  $P = 0.036$ ). In addition, the frequency of rural residents among patients with renal

**Table 1: Clinical and demographic characteristics of patients with urinary cancers**

Variables	n (%)
Gender	
Male	196 (75.1)
Female	65 (24.9)
Age group	
0-14	3 (1.2)
15-29	4 (1.6)
30-44	15 (5.8)
45-59	66 (25.2)
60-74	96 (36.7)
>74	77 (29.6)
Residence area	
Urban	105 (40.2)
Rural	75 (28.7)
Unknown	81 (31)
Diagnostic method	
Pathology	208 (79.7)
DCO	26 (10)
Clinical	27 (10.3)
Behavior cancer	
Malignant, primary site	257 (98.5)
Carcinoma <i>in situ</i>	4 (1.5)
Grade	
Well differentiated	22 (8.4)
Moderately differentiated	40 (15.3)
Poorly differentiated	9 (3.4)
Grade not determined	190 (72.8)

DCO: Death certification only

**Table 2: Comparing the demographic and clinical characteristics of patients with bladder and renal cancers**

Variables	Kidney	Bladder	P
Age (mean±SD)	61.27±14.6	66.30±14.44	0.036
Gender; n (%)			
Male	31 (68.9)	154 (76.2)	0.342
Female	14 (31.1)	48 (23.8)	
Area residence; n (%)			
Urban	12 (40)	88 (61.5)	0.041
Rural	18 (60)	55 (38.5)	
Grade; n (%)			
Well differentiated	2 (12.5)	18 (34)	0.223
Moderately differentiated	12 (75)	28 (52.8)	
Poorly differentiated	2 (12.5)	7 (13.2)	

SD: Standard deviation

cancer was significantly higher than that among patients with bladder cancer (60% vs. 38.5%, respectively,  $P = 0.041$ ).

## Discussion

We found that approximately three-fourths of the patients with urologic cancers were men and two-thirds of them aged over 60. Bladder cancer (77.4%) and renal cancer (17.2%) were the most common malignancies of the urinary system. The standardized prevalence of bladder and renal cancers among men was 88.7/100,000 which was 11 folds higher than women.

According to the results of a study, the standardized incidence of bladder and renal cancers among Iranian men was estimated as 8.35 and 1.39 per 100,000, respectively, in 2003, and 12.59 and 2.65 per 100,000, respectively, in 2009. The difference during the time was 1.5% and 1.8%, respectively, for bladder and renal cancers. Moreover, the standardized incidence of bladder and renal cancers among Iranian women was 2.12/100,000 and 0.96/100,000, respectively, in 2003, and also 3.28/100,000 and 1.93/100,000, respectively, in 2009. During this time, the incidences were changed as 1.54% and 2.01% for bladder and renal cancers, respectively.<sup>[4]</sup> The standardized incidence of bladder cancer during a 5-year period in Fars Province (southwest of Iran) has been reported as 6.8/100,000.<sup>[12]</sup> Comparing the results of the present research with those of the previous studies indicates that the incidence of these two cancers in northern Iran is lower than that in the other parts of this country. However, considering the quality and quantity of cancer registry system in Iran, such conclusion should be declared with cautious.

In 2012, renal and bladder cancers were responsible for 2.9% and 4.4% of all malignancies, respectively, among men with age-standardized rates (ASRs) as 6 and 9, respectively. In 2012, 1.9% and 1.5% of all cancers diagnosed among women were attributed to renal (ASR = 3.1) and bladder (ASR = 2.2) cancers, respectively.<sup>[9]</sup> In that time, 3.3% of all cancers diagnosed in the European countries were renal, pelvis, and ureter cancers which were the seventh most common cancers.<sup>[13]</sup> A study conducted in the Turkish Republic of northern Cyprus using the registered cancer data during 2007–2012 showed that the ASR for bladder cancer among men was 11.71.<sup>[14]</sup> In 2009, the ASR for bladder cancer among men in Serbia was reported as 16.2/100,000.<sup>[2]</sup> In Shanghai, China, the ASR of kidney and renal pelvis among men during 1973–1977 was 1.27 which was increased to 8.41 in 2006–2010. The corresponding rates among women were 0.93 and 4.06, respectively. The ASR of bladder cancer during these two time periods was changed from 6.49 to 7.72 in men and from 2.01 to 2.18 in women.<sup>[10]</sup> Results of the studies carried out in other countries indicated the lower incidence of these cancers in north of Iran compared to the other regions in the world.

The mean age of diagnosis of the bladder cancer during 2003 and 2009 among Iranian men was reported as 64.22 and 64.77 years, respectively. The corresponding figures for Iranian women were 64.96 and 64.57, respectively. The changes were not statistically significant. Moreover, the mean age of diagnosis of renal cancer among Iranian women changed from 49.75 in 2003 to 50.95 in 2009. In men, the age was changed from 54.25 in 2003 to 54.55 in 2009. These changes were also nonsignificant.<sup>[4]</sup> It seems that the age of diagnosis for cancer in the northern part of Iran is similar to that in the other parts of this country.

In this study, we used cancer registry data for 1 year. Therefore, the trend of changes could not be estimated which is one of the limitations of the study. It should be noted that due to the different quality of cancer registry during different times, an appropriate judgment and discussion about the trends and changes over time are difficult. Another limitation of the study is low number of the study variables. On the other hand, the source of information in the current study was a population-based registry system with high coverage including most cases of cancer in the study area.

## Conclusion

Our study showed that most cases of urinary system cancers are men aged >60. The most cancers of the urinary system were bladder and renal cancers, respectively, in both genders. It is recommended to investigate the trend and changes in the incidence of urologic cancers over time using statistical methods considering the limitations of the present cancer registry system.

## Acknowledgment

The present study was financially supported by Mazandaran University of Medical Sciences, Iran. The authors would like to thank to all persons who cooperate in the data collection for cancer registry system.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## References

1. Zahedi A, Rafiemanesh H, Enayatrad M, Ghoncheh M, Salehiniya H. Incidence, trends and epidemiology of cancers in North West of Iran. *Asian Pac J Cancer Prev* 2015;16:7189-93.
2. Mihajlović J, Pechlivanoglou P, Miladinov-Mikov M, Zivković S, Postma MJ. Cancer incidence and mortality in Serbia 1999-2009. *BMC Cancer* 2013;13:18.
3. Hamdi Cherif M, Serraino D, Mahnane A, Laouamri S, Zaidi Z, Boukharouba H, et al. Time trends of cancer incidence in Setif, Algeria, 1986-2010: An observational study. *BMC Cancer* 2014;14:637.
4. Basiri A, Shakhssalim N, Jalaly NY, Miri HH, Partovipour E,

- Panahi MH, *et al.* Difference in the incidences of the most prevalent urologic cancers from 2003 to 2009 in Iran. *Asian Pac J Cancer Prev* 2014;15:1459-63.
5. Mirzaei M, Pournamdar Z, Salehiniya H. Epidemiology and trends in incidence of kidney cancer in Iran. *Asian Pac J Cancer Prev* 2015;16:5859-61.
  6. Bouchbika Z, Haddad H, Benchakroun N, Eddakaoui H, Kotbi S, Megrini A, *et al.* Cancer incidence in Morocco: Report from Casablanca registry 2005-2007. *Pan Afr Med J* 2013;16:31.
  7. Green J, Banks E, Berrington A, Darby S, Deo H, Newton R, *et al.* N-acetyltransferase 2 and bladder cancer: An overview and consideration of the evidence for gene-environment interaction. *Br J Cancer* 2000;83:412-7.
  8. Boffetta P, Winn DM, Ioannidis JP, Thomas DC, Little J, Smith GD, *et al.* Recommendations and proposed guidelines for assessing the cumulative evidence on joint effects of genes and environments on cancer occurrence in humans. *Int J Epidemiol* 2012;41:686-704.
  9. Ferlay J, Soerjomataram I, Dikshit R, Eser S, Mathers C, Rebelo M, *et al.* Cancer incidence and mortality worldwide: Sources, methods and major patterns in GLOBOCAN 2012. *Int J Cancer* 2015;136:E359-86.
  10. Bao PP, Zheng Y, Wu CX, Huang ZZ, Gao YT, Jin F, *et al.* Cancer incidence in urban shanghai, 1973-2010: An updated trend and age-period-cohort effects. *BMC Cancer* 2016;16:284.
  11. Rohani-Rasaf M, Moradi-Lakeh M, Ramezani R, Asadi-Lari M. Measuring socioeconomic disparities in cancer incidence in Tehran, 2008. *Asian Pac J Cancer Prev* 2012;13:2955-60.
  12. Masoompour SM, Yarmohammadi H, Rezaianzadeh A, Lankarani KB. Cancer incidence in Southern Iran, 1998-2002: Results of population-based cancer registry. *Cancer Epidemiol* 2011;35:e42-7.
  13. Li P, Znaor A, Holcatova I, Fabianova E, Mates D, Wozniak MB, *et al.* Regional geographic variations in kidney cancer incidence rates in European countries. *Eur Urol* 2015;67:1134-41.
  14. Pervaiz R, Tulay P, Faisal F, Serakinci N. Incidence of cancer in the Turkish republic of Northern Cyprus. *Turk J Med Sci* 2017;47:523-30.