

*Original Investigation*

Trends on Central Nervous System Cancers in Turkey

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ABSTRACT

AIM: We aimed in this study sharing our inferences about this topic with the whole health community.

MATERIAL and METHODS: Turkish National Cancer Statistics, statistics of Turkey in GLOBOCAN 2018 and worldwide statistics country-by-country in GLOBOCAN 2018 was compared to reach a summary on this topic.

RESULTS: CNS tumors are 10th in cancers in men with 5.2 for per 100.000. Also, in women group, CNS tumors' rate is 4.1 for per 100.000 and take the 9th place of mostly seen first ten neoplasms. In general, the incidence of CNS cancers in women in our country is less than men as in the whole World. Turkish data between the years of 2010-2014 has shown that there is no significant difference for both sexes.

CONCLUSION: Although CNS cancers do not have high incidence rates, they have important mortality rates and, they consist of one of a serious cause of death. Increase in the lifetime, exposure to environmental factors for the longer time, increasing usage of radioactive materials in our lives, easier access to healthcare systems and developing diagnosing possibilities may rise the incidence rates on CNS in the future. On the other hand, developing treatment modalities and posttreatmental care strategies may reduce the mortality in these group of the patient despite the high incidence .

KEYWORDS: Central nervous system cancers, Trends of cancer, Turkey

■ INTRODUCTION

The incidence of cancer is increasing dramatically worldwide, and cancer remains the leading cause of death in the 21st century. Central nervous system (CNS) cancers accounted for approximately 296,851 (1.6%) of new cancer cases in 2018 (2). Although the incidence of CNS cancers is not high compared to others, it is an important health problem due to its aggressive course and difficulties in follow-up and treatment in the postoperative period.

Health professionals and politicians need accurate, adequate and reliable cancer statistics for monitoring and treating malignancies. In addition, the sustainability of these statistics over the years can be an indicator of the effectiveness of health policies.

Cancer statistics in Turkey are provided by the National Cancer Statistics Unit of the Turkish Ministry of Health.

This is the first report exploring the incidence and trends of CNS cancers in Turkey. In this study, we share our findings on the topic with the health community.

■ MATERIAL and METHODS

The incidence data were obtained from the National Cancer Statistics Report of the Cancer Control Department, Turkish Ministry of Health (14). The Cancer Control Department began collecting population-based cancer incidence reports in 1992, using qualified, professional data collectors (9). The reports are prepared according to data from the active cancer registry centers that scan a proportion of the Turkish population. These active cancer control centers scan the population region by region homogeneously. In 2010, nine active cancer control centers acquired data for 23.4% of the whole population.

As the number of these centers increased to 13 in 2012, the ratio of the surveyed population reached 40%. In 2014, representation of the population was 47.7% (14).

In addition, the World Health Organization (WHO) set some parameters and established agencies to research and collect data on cancer. The International Agency for Research on Cancer (IARC) is the agency established by WHO. The Global Cancer Observatory (GCO) is an interactive platform for presenting global cancer statistics that is steered by the IARC. GCO collects the statistics in a database named GLOBOCAN. GLOBOCAN most recently published cancer statistics in 2018. This database includes incidence, mortality, and prevalence of 36 types of cancer. 185 countries including Turkey are covered in the database (2).

Malignancies are defined according to the International Statistical Classification of Diseases and Related Health Problems (ICD-10) system. C70, C71, and C72 codes generally represent the central nervous system cancers in this coding. Specifically, C70 is for meningeal malignant tumors, C71 for brain malignant tumors and C72 is for spinal cord malignant tumors (16).

We examined the incidence, age-standardized rates (ASR) and prevalence rankings of all the meninges, brain and spinal cord cancers because these three malignant tumor groups are evaluated together, not separately, in the Turkish National Cancer Data.

In our report, the male and female incidence of CNS cancers over the years is presented and age is categorized by the decades 0 to 9, 10 to 19, 20 to 29, 30 to 39, 40 to 49, 50 to 59, 60 to 69, 70 to 79 and 80+.

Turkish National Cancer Statistics, the statistics of Turkey in GLOBOCAN 2018, and worldwide statistics country-by-

country in GLOBOCAN 2018 were compared to reach a conclusion on this topic.

CONCORD is a global program for calculating the worldwide survival rates of cancer. The third version was published in 2018. It includes data and survival rates for 18 cancer species from 71 countries, including Turkey.

RESULTS

When GLOBOCAN 2018 is examined, it can be seen that CNS cancers are not at the forefront in the incidence ranking of all cancers (Table I). However, although CNS cancers are more rare than other cancers, the rankings of deaths from these malignant tumors are higher than their incidence rates (2). As we show in Table-1, the deaths from CNS cancers are higher than their incidence rates without variation in Europe, North and Latin America, Africa, Asia, and Oceania.

According to the Turkish National Cancer Report, the total number of cancer cases listed in 2010-2014 was 339,982. CNS cancers (C70-71-72) represented 7,739 of them. Turkish National Cancer 2014 data show that the most common cancer in men is respiratory system cancers at 52.5 per 100,000. CNS cancers are ranked 10th in cancers in men at 5.2 per 100,000. In addition, the most common cancer in women is breast cancer at 43 per 100,000. In this group, the rate for CNS cancers is 4.1 per 100,000 taking ninth place in the ten most frequent cancers (14). In general, the incidence of CNS cancers in women is lower than men in our country as it is in the whole world (2,5,11,13,14). Turkish data between the years 2010 and 2014 show that the CNS cancer incidence

Table I: The Numbers and Rankings of New Cases and Deaths in the Population Because of CNS Cancers Across Different Countries According to GLOBOCAN 2018 Data

	New Cases		Deaths	
	Number	Rank	Number	Rank
Algeria	1686	10	1326	6
Egypt	4555	6	3796	6
China	76494	15	63860	10
Israel	492	16	469	8
India	28144	10	24003	10
Germany	7769	16	6559	13
Norway	418	16	361	8
Croatia	526	15	443	10
United Kingdom	5760	19	4541	12
Canada	2820	18	2426	11
United States	24237	18	17544	10
Brazil	12304	13	10711	8
Australia	1983	18	1639	10
Turkey	5909	11	5084	7

was 5.7, 5.7, 6.1, 6.1 and 5.2 per 100,000, respectively in men and 4.4, 4.5, 4.7, 4.7 and 4.1 per 100,000, respectively in women in Turkey. These numbers show that there is no significant difference between the sexes (Figure 1).

We divided age groups in our study into decades from birth to 80 and over. In both male and female groups, the results showed a peak of incidence of CNS cancers in the sixth decade of life (14) (Figure 2A, B).

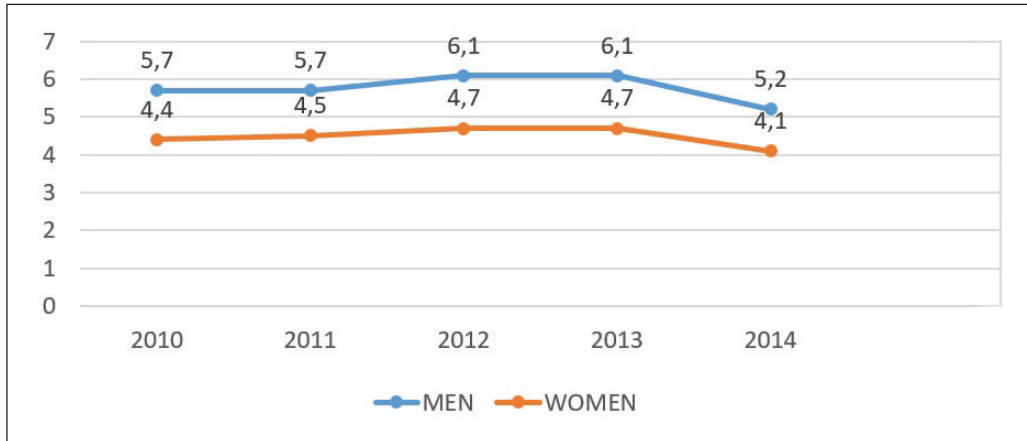


Figure 1: Age standardized incidence rates per 100,000 (Men vs. Women).

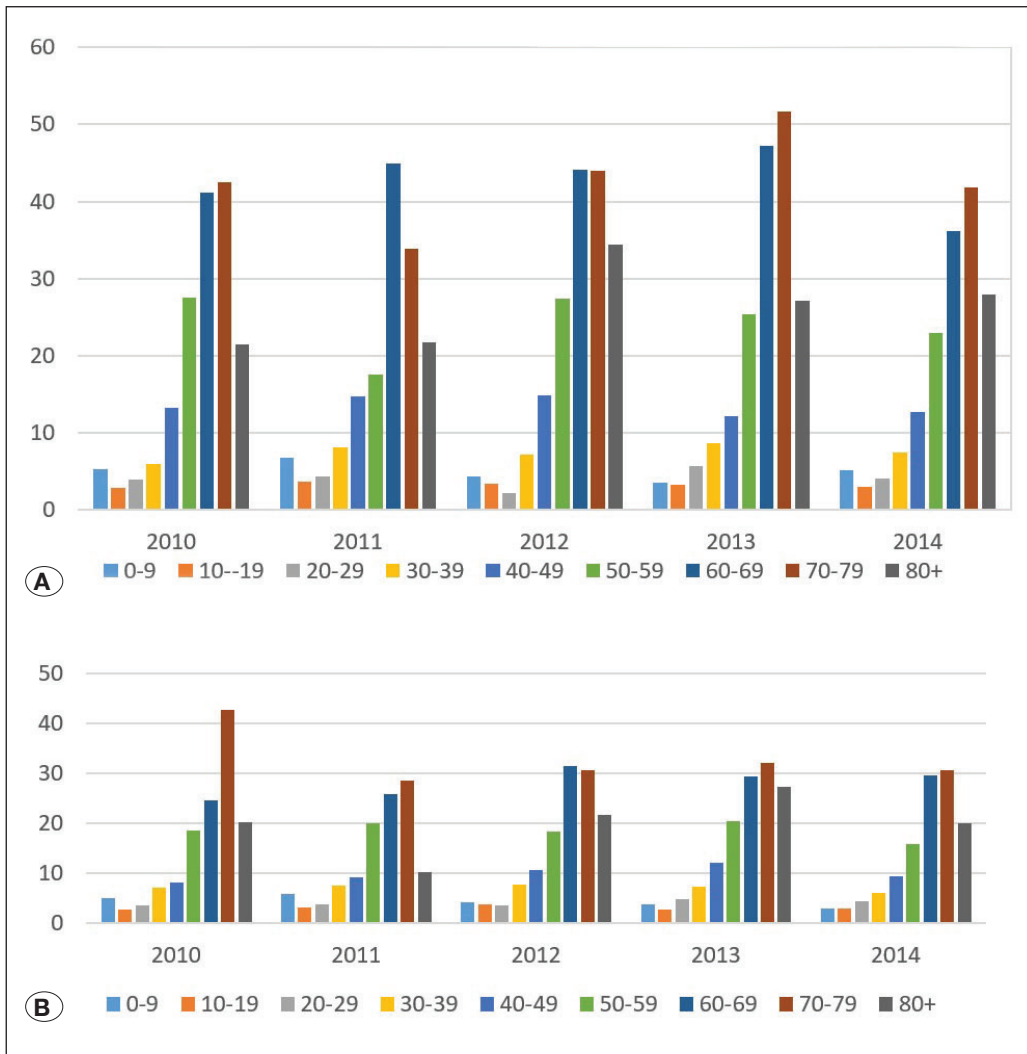


Figure 2: A) Distribution of incidence according to years and age groups in men (2010-2014). **B)** Distribution of incidence according to years and age groups in women (2010-2014).

■ DISCUSSION

Our study is the first publication on the trends of CNS cancers in Turkey from 2010 to 2014. The incidence data were obtained from the National Cancer Statistics Report of the Cancer Control Department, Turkish Ministry of Health, GLOBOCAN 2018 data, and the CONCORD-3 study.

The Turkish National Cancer Report shows that there was no significant difference in all cancer incidences between the years 2010 and 2014 (14). In addition, there was no significant difference in CNS cancer incidences in men and women in that period in Turkey (Figure-1).

When we compared GLOBOCAN 2012 and 2018 data, we detected that the incidence of CNS cancers in both men and women increased throughout the world, but not significantly (2,7). IARC collects data on 36 different cancer types from 185 countries and combines them in the GLOBOCAN database. They use various categorization methods to estimate data quality, and the data are divided into different classes according to priority. The data collected from Turkey are classified in the "Local 2b" class in the GLOBOCAN database. In our study, we concentrated on the countries taking part in "National-Local 1" and "Local 2b" classes as seen in Table I (6).

Adalberto Miranda-Filho et al. reported that in their studies in 2017, the incidence of CNS cancers was increasing in Europe compared to Asia (12). In addition, GLOBOCAN 2018 reported that more developed countries have higher CNS cancer incidence rates than less developed countries (2). Ease of access to health care services and the availability of diagnostic methods such as computerized tomography and magnetic resonance imaging may explain the increasing incidence rates in more developed countries (12). In contrast to the underlined increase of the incidence in some regions, the latest studies show that there is a decrease in the incidence of CNS cancers in Japan. This may be explained by the fact that CNS cancer incidence data in Japan do not include meningeal tumors and the data are not combined with brain and spinal cord cancers (10,12).

In the literature, many articles point out that men have a higher incidence of brain and CNS cancer than women, which is consistent with data published from almost all countries (2,5,12,14). In addition, some reports have shown that there is a difference in the incidence of CNS cancers among different races and ethnic groups in the United States. Wrensch and colleagues suggested that variations in socioeconomic status/ease of healthcare access may partly explain the higher rates among US whites relative to US Afro-American citizens (17).

Nearly all studies stress that the incidence of CNS cancers is higher in elderly people and that the risk of malignancy might continue to increase with age (5). Increased exposure to life-long environmental factors may explain the high incidence of CNS cancers in the elderly (3,4,8,12,15).

According to CONCORD-3, age-standardized five-year net brain cancer survival was in the range 20–40% in most countries (1). CONCORD-3 showed that five-year incidence (2010–2014) of brain cancers in Turkey is in the range 30–

40% like other countries including Canada, the United States, Germany, Belgium, Sweden, Norway, India, Korea, and Australia (1). This study reported that five-year brain cancer survival was higher than 40% only in Japan (46%) and Croatia (42%). Also, CONCORD-3 declared that the five-year brain cancer survival rate is in the range 20–29% in 20 countries including the Netherlands, the Czech Republic, the United Kingdom, and Russia. The five year incidence of brain cancers is below 20% only in Thailand with 15% (1).

According to the CONCORD-3 report, trends in five-year survival of brain cancer between 2000 and 2004 and 2010 and 2014 were generally rather flat, but survival rates increased by 3–5% in 15 countries and by 6–10% in more than 13. Turkey is not included in these two groups of countries (1).

■ CONCLUSION

This is the first publication of trends for CNS cancers in Turkey. Although CNS cancers do not have high incidence rates, they have significant mortality rates and are a major cause of death. The active cancer registry centers in Turkey provide reliable, qualified, sustainable cancer incidence data. Between the years 2010 and 2014, the CNS cancer trend has not changed. The higher incidence rates in men and the elderly are similar to reports from almost all other countries. The lack of survival data in this report can be seen as a weakness of the study.

Increases in life expectancy, longer exposure to environmental factors, increasing use of radioactive materials, easier access to healthcare systems and developing diagnostic possibilities may raise the incidence rates of CNS in the future. On the other hand, developing treatment modalities and post-treatment care strategies may reduce mortality in these groups despite the high incidence.

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