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Research Article

Incidence Patterns of Primary Central Nervous System Tumors (CNS) in Albania

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Abstract

Central nervous system tumors are a heterogeneous group of neoplasms that include all forms of primary and secondary neoplasms developed within the cranial and vertebral cavity. A total of 1883 cases with CNS tumors were registered during 1993 - 2013, of these 977 cases (49%) were evaluated and interviewed during the period 2010 - 2013. During this study, we note the increasing incidence of CNS tumors during years. Interpretation of this increase is complicated greatly from two peaks, in 1995 - 1996 and 2001 - 2002, the period corresponding to the addition of diagnostic procedures (CT scan) or improving their (the introduction of MRI).

Age and gender are important risk factors in development of brain tumors, from 55 - 80 years old the incidence is higher, and we determined the exclusive predominance of women in meningioma and a predominance of males in glioma. The impact of improved diagnostic methods was seen particularly in the growth of incidence over the years. Age and gender are important risk factors in development of various brain tumors.

Keywords: *Tumors; Nervous System; Epidemiology; Incidence; Relative Risk*

Introduction

Tumors of the Central Nervous System (CNS) are a heterogeneous group of neoplasms which include all the primary neoplasms or secondary ones developed within the cranial -vertebral cavity. Tumors of the Central Nervous System (CNS) make round about 2% of all the new cancers and the same percentage are reported in European and Non-European population [1-3]. They represent an unusual neoplasms group regarded to the incidences, however they make up a usual from of death from cancer, thus representing approximately nearly 3.5% of all the deaths from cancer [4].

Lastly, a growing trend of the tumors of Central Nervous System (CNS), is reported by several studies [1-5] a part of that growth in incidence may be attributed to the improvement of the diagnostic techniques however the great part belongs to the real growth probably due to the increase of the number of the risk factors as well as to the continuance of the exposure to them [5-16].

Methods

Starting from the 1993 up to 2013 we have registered a total number of tumors of Central Nervous System (CNS) of 1883 cases. Dates from 1993 up to 2010 are taken by the register of pathological examinations in both services, i.e. that of Neurosurgery and Pathological – Anatomy. Out of these cases 977 ones (49%) are being interviewed to be analyzed in the risk factors, during the period December 2010 – December 2013.

The statistical analyze was conducted by Dr. G. Kaloshi using the software LMP 11 (SAS company). We used OR-exposure odds ratios and IC- 95% confidence interval to determine if the risk factors are considered accompanied with a growing risk to develop brain tumors. The unlimited logistic regression includes correlates with age and sex as variables. Other processing have been needed in order to calculate the potential "confounding".

Results

As it is shown in table 1 about the incidence according the years we do notice a growth of the incidence of the tumors of CNS. The interpretation of that growth is greatly complicated from 2 "peaks", respectively from the period 1956 - 1996 and 2001 - 2002, periods which coincide with a growth of diagnostic procedures (CT scan) or their improvement (the presence of MRI). Those procedures have been present for neurosurgeons thus changing or improving not only the professional experience of the staff but also the diagnostic and therapeutic care even the access of the patients of all ages. The impact of diagnostic improvement may be noticed mainly to the significant increase of the incidence through passing of the years to the extremities of the age groups, respectively under 10 years old and over 70 years old. This means that the doctors are becoming increasingly willing to evaluate and treat the aged patients by changing the popular paradigms.

Year	Benign tumors	Malignant tumors	Total Tumors
1993	3.4	4.8	8.2
1994	3	4.6	7.6
1995	3.1	4.7	7.8
1996	4	6.1	10.1
1997	3.1	4.4	7.5
1998	3.3	4.5	7.8
1999	3.6	4.8	8.4
2000	3.8	5.2	9
2001	4.2	6.1	10.3
2002	4.5	6.6	11.1
2003	4.8	6.8	11.6
2004	5.1	7.1	12.2
2005	5.2	7.2	12.4
2006	5.1	8.1	13.2
2007	5.5	8.4	13.9
2008	5.2	8.5	13.7
2009	5.8	8.8	14.6
2010	5.6	9.2	14.8
2011	5.8	9.4	15.2
2012	5.7	9.2	14.9
2013	6	9.4	15.4

Table 1: *Tendency in the incidence of the tumors according to their histology through years.*

Examination of the incidence tendency in the high glioma versus low grade glioma shows us a convergence to the growth of the incidence for the age groups of 15 - 44 years old, meanwhile we do notice a "dramatic" divergence to the incidences of the high grades (a growth) and those of low ones (decreasing tendency) for the age groups of 45 years old (Table 2).

	GBM	Astro	Oligo	Meningeoma	Medulo/PNET	Ependimoma	Mix Glioma	Total
0 - 19	0.4	0.8	0.2	0.01	0.7	0.4	0.06	5.1
20 - 34	0.8	1.3	0.7	0.8	0.3	0.5	0.25	7.2
35 - 44	1.8	2.1	0.9	2.5	0.15	0.6	0.2	9.3
45 - 54	4.5	2.6	0.8	5.2	0.1	0.7	0.28	12.6
55 - 64	8.1	3.8	0.7	7.1	0.05	0.55	0.3	14.1
65 - 74	10.2	4.2	0.4	9.9	0.08	0.4	0.18	16.6
75 - 84	9.8	3.9	0.2	11	0.04	0.3	0.1	17.5
85+	7.7	2.4	0.06	10.9	0.03	0.2	0.07	16.2

Table 2: *Incidence of tumors according age groups and histology.*

Age

Age is the main factor in the determination of the incidence and prognosis of the tumors of CNS. The incidence of the tumors seems to present a close relation with patient's age. This based on the fact that different tumors have a higher incidence to certain age groups, is higher in age group 64 - 69 years old, 18.9 per 100 000.

Age group	Incidence
0 - 4	0.2
05 - 09	0.8
10=14	1.8
15 - 19	2.9
20 - 24	3.4
25 - 29	3.7
30 - 34	4.2
35 - 39	5.8
40 - 44	7.4
45 - 49	8.8
50 - 54	9.2
55 - 59	10.4
60 - 64	14.5
65 - 69	18.9
70 - 74	16.4
75 - 79	15.8
80+	12.7

Table 3: *Standardized incidence (in x 100.000) according the age group.*

Sex

Sex represents an important risk factor mainly for the two main types of tumors of CNS, gliomas or neuro-epithelial tumors and meningiomas (meningeal tumors) where we do notice a dominance of males for gliomas and "an exclusive" dominance of females for meningiomas.

Sex	Benign	Borderline	Malignant
Males	4	1.1	8.2
Females	7.2	1	6.4

Table 4: *Standardized incidence (in x 100.000) according the age group and sex.*

Discussion

There was an increase in the incidence of primary central nervous system tumors. The incidence of brain tumors varies with age and histology Age and gender are important risk factors in development of brain tumors, from 55 - 80 years old the incidence is higher, the peak incidence in our country is around 65 years old, and we determined the exclusive predominance of women in meningioma and a predominance of males in glioma. In adults glioblastoma, astrocytoma are much more frequently. The impact of improved diagnostic methods was seen particularly in the growth of incidence over the years. Age and gender are important risk factors in development of various brain tumors.

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