

Retrospective study of central nervous system tumors in the five wars country

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Abstract

Background: CNS tumors constitute 2% of all cancers and are observed in 4-5 in 100,000.

Aims of study: Detecting the incidence rates of CNS tumors in relation to age, sex, geographical distribution, environmental, and genetic factors. For explaining of the associated clinical features and to determine the effect of radiotherapy, and chemotherapy on the patient's outcome.

Methods: Prospective study of CNS tumors started from the beginning of Jan 2016 to the end of Apr 2016. The study was performed in the outpatient clinic of Oncology Teaching Hospital / Medical City in Baghdad. All patients underwent surgery, chemotherapy and/or radiotherapy, then followed up. The outcome of management was divided into: Good outcome, fair outcome, and poor outcome.

Results: The fifth decade is the most common involved age, with male more than females, and is higher in the south of Iraq. There is little association of CNS tumors with genetic factors, and high association with environmental factors, and smoking. Neurological deficit was the main chief complaint, and headache was present in most of the patients at time of diagnosis. Frontal region was the commonest site for CNS tumors with size of 1-5 cm, and mostly associated with edema and positive enhancement. Meningioma was the commonest histological type.

Conclusions: There is a poor relation between genetic factors and CNS tumors. There is great relation between environmental factors, smoking and CNS tumors. Headache is not the dominant chief complaint. Total resection of the tumor followed by radiotherapy and/or chemotherapy has the best prognosis in patient's outcome.

Introduction

Brain tumor is one of the serious health problem and early diagnosis, awareness of clinical presentation, use proper investigation, many modalities available in treatment chose the proper one in proper time is very important to save the patient and get survival and disease-free period [1]. CNS tumors constitute 2% of all cancers and are observed in 4-5 in 100,000 [2]. CNS tumors exhibit different behaviors according to age, histology, and location [1]. Sixty percent of all primary brain tumors are glial tumors, and two-thirds of these are clinically aggressive, high-grade tumors [1,2]. Symptoms depend on tumor histology, location, and age. Brain tumors cause neurological disorders by either infiltrating normal CNS structures or obstructing CSF pathways and subsequently increasing intracranial pressure [3]. This increase in intracranial pressure results in the early symptoms of brain tumors: headaches, vomiting and lethargy [3]. 60% of all primary brain tumors are glial tumors, and two-thirds of these are clinically aggressive, high-grade tumors [1].

Patients and methods

Retrospective study of CNS tumors started from the beginning of Jan 2016 to the end of Apr 2016 in which a thorough work up of 47 patients were involved. They were taken from the outpatient clinic of Oncology Teaching Hospital / Medical City in Baghdad. All patients proved had brain tumor by histopathological examination. Both sexes involved (26 male and 21 female), and their ages are ranging from (6-73

years). Everyone examined thoroughly and the result were classified, and interpreted according to clinical features and radiological parameters, these includes important signs and symptoms, diagnostic aids with analysis of brain CT and MRI findings, and other diagnostic procedure together with treatment modalities of brain tumor by its different surgical intervention, radiotherapy and chemotherapy. All patients underwent surgery. 42 patients received chemotherapy and/or radiotherapy. RT was done by using 3D contouring technique by linear accelerator machine. The remaining patients didn't follow up after surgery because they didn't attend to our outpatient's clinic according to their dates of radiotherapy, chemotherapy and follow up visits. The outcome of management was divided into:

Good outcome

The patients discharge with signs and symptoms better than before management e.g. improvement of hemiparesis or improvement of the level of consciousness.

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Fair outcome

The patients after management remain approximately with the same general condition but with no new neurological deterioration.

Poor outcome

The patients have new neurological deficits or deterioration in general condition.

Statistical analysis was done by using (IBM SPSS v.20) which is a software package used for statistical analysis in addition to the usage of (Microsoft excel 2010) for data sheet collection. The data of all cases were entered and analyzed, then descriptive and analytic statistics were performed using an appropriate statistical configuration (Table 1).

Results

In this study of 47 patient with brain tumor, the age distribution was as fallow and the peek incidence was in age (40-49) years, male more than female. In family history negative in 39 patients. Study revealed that neurological deficit then the convulsion is most frequent chief complaint. Frontal then parietal is the most common site for diagnosed brain tumor in the study. The size 1 - 5 cm were the most frequent. Total resection in the best surgical intervention in relation to outcome even in difficult area or inoperable tumor biopsy remain vital for diagnosis. After surgery histopathology result was glioma is about one third of the sample, while meningioma presented another third and all other histological types in the last third.

Discussion

In this study the age was from 9-73 years and the mean age was 43 years. The commonest age group was the fifth decade of life (40-49 years), because of the multiple wars in the last 35 years in Iraq, and the exposure to toxic gases, radiations and different chemical materials from bombs, blasts and missiles starting from Iran's war, Kuwait's war, Saddam's fall war and finally the continuous war against terrorist and ISIS till now, we compare our results to other study like Ramandeep et al. [2], which show that 6th decade is the commonest age group. Male is involved in CNS Tumors more than female in our study with male: female ratio 1.23:1. Males were 26 (55.3%), while females were 21 (44.7%). This may attribute to genetic factors or more accurately in Iraq due to environmental exposure. When we compare our results to other study as Chang-Hyun *et al.*, [3], the females were involved more than males with the female: male ratio 1.43:1.

Our study shows that the patients with family history were 17%, and those with no history of malignancy were 83%, these were resembling to Quinn et al. [4], that results close to each other, and this improve the poor relation between genetic factors, and CNS tumors.

Our study shown that tobacco smoking observed in 38 (80.8%) and those ingested alcohol were 9 (19.2%) of patients.

The results of our study shown that neurological deficit is the commonest chief compliant in 12 (25.5%), followed by convulsions in 11 (23.40%), then headache in 8 (17%). Studies by Hreholz et al. [5] and Louis et al. [6], found that headache was the most common chief compliant and the explanation for this variation is the ignorance of our population to daily headache (considering it as tension headache) and delay in seeking for medical advice until other symptoms like disturb consciousness, convulsions or neurological deficit appears. The same things for nausea and vomiting and others; there is a variation which attributed to sign and symptoms of early increase ICP in the early stage

Table 1. Shown all the study features

Characteristics		n (%)
Sex	Male	26 (55.3)
	Female	21 (44.7)
Age (years)	0-9	1 (2.1)
	10-19	2 (4.3)
	20-29	7 (14.9)
	30-39	9 (19.1)
	40-49	13 (27.7)
	50-59	6 (12.8)
	60-69	7 (14.9)
	>70	2 (4.3)
Family history	Positive	8 (17)
	Negative	39 (83)
Social habits	Smoker	38 (80.8)
	Alcohol	9 (19.2)
Chief complaint	Disturb consciousness	6 (12.8)
	Headache	8 (17)
	Nausea and vomiting	4 (8.5)
	Convulsion	11 (23.4)
	Neurological deficit	12 (25.5)
	Visual disturbance	2 (4.3)
	Ataxia	1 (2.1)
	Mental changes	3 (6.4)
Surgical procedures	Biopsy	3 (6.4)
	Subtotal resection	21 (44.7)
	Total resection	23 (48.9)
Histopathology	Meningioma	14 (29.8)
	GBM	9 (19.2)
	Gliomas	6 (12.8)
	Astrocytoma	5 (10.6)
	Nerve sheath tumor	4(8.5)
	Pituitary tumor	3 (6.4)
	Oligodendroglioma	1 (2.1)
	Lymphoma	1 (2.1)
	Ependymoma	2 (4.3)
	Embryonal tumor	1 (2.1)
	Craniopharyngioma	1 (2.1)
Tumor sites	Frontal	11 (23.4)
	Fronto-parietal	7 (14.9)
	Parietal	10 (21.3)
	Temporal	8 (17)
	Parieto-temporal	3 (6.4)
	Parieto-occipital	3 (6.4)
	occipital	3 (6.4)
	Brain stem	2 (4.3)
Tumor size (cm)	<1	9 (19.2)
	1-5	14 (29.8)
	5.1-10	8 (17)
	10.1-20	7 (14.9)
	>20	9 (19.2)
Treatment modes	RT	31 (66)
	Chemoradiation	11 (23.4)
	Not applicable	5 (10.6)
Outcome	Good	17 (36.2)
	Fair	22 (46.8)
	Poor	8 (17)

of the CNS tumors development and because of the delay in diagnosis in our country until late stages when there is high increase in ICP.

Frontal lobe was the major site affected 23.4%, followed by parietal 21.3%, temporal 17%, occipital 6.4%, and then brain stem 4.3%, also

we found 27.65% was shared between two lobes. By look to the study results of Umeo et al. [7], frontal lobe was 17.2%, parietal 8.6%, temporal 26.2%, occipital 3.4%, brain stem 0.8%, and multi-lobes 43.8%.

The highest result for 1-5 cm tumor size obtained, which dislike of Mark et al. [8], it was 4-6 cm.

The biopsy presented in 6.4%, the subtotal resection 44.7%, and the total resection 48.9%. The total resection is the best one when it is possible because of its better prognosis and survival results. American Brain Tumor Association stated that the most common surgical option is biopsy followed by subtotal resection and then total resection when available [9].

Regarding histopathology meningioma presented in 29.8%, GBM 19.2%, Glioma 12.8%, astrocytoma 10.6%, nerve sheath tumor 8.5%, and pituitary tumor 6.4%. These were similar to that of Alturki et al. [10].

All 31 (66%) received radiotherapy, 11 (23.4%) received chemoradiation, and 5 patients (10.6%) did not receive any things (because they canceled date of radio or chemotherapy). So the good outcome found in 17 (36.2%), the fair 22 (46.8%), and the poor outcome in 8 (17%) only.

In radiology findings the enhancement presented in 97.9%, followed by edema 91.5%, mid line shift 87.2%, necrosis 80.9%, cystic changes 78.7%, and calcification 10.6%, this is too close to the results of Assari et al. [11].

Conclusions

There is a poor relationship between genetic factors and CNS tumors because 83% of the patients in our study had negative family history of

malignancy. Males in Iraq more than female affected. According to our results, there is a high association between smoking and CNS tumors. Headache was not 1st chief complaint for CNS tumors in our country. Total resection of the tumor followed by radio and/or chemotherapy has better prognosis in the outcome.

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