Time Trends of Brain Tumors in Jordan: Age at Diagnosis, Gender and Histological Type

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Abstract
In Arab Countries, including Jordan, limited descriptive brain cancer data is available. We investigated the time trends of brain tumors with respect to gender and histological type distribution and age at our institution over the 1981-2011 period. We found a slight male predominance (52%, P< 0.05) throughout the study period for all tumors combined, with more pronounced male predominance for glioblastoma multiforme, anaplastic astrocytoma and oligodendroglioma. Meningioma and pinocytoma showed female predominance (P<0.05). The gender distribution was stable for all histological types over the entire 30-year period. Relative frequency of all histological types was stable over the 30-year period except for anaplastic astrocytoma. However, the absolute numbers of cases diagnosed at the hospital increased in 18 of the 42 different types of tumors identified, peaking in 1990-1991 and in 2003-2006. Mean age at diagnosis for the study population was 35.2 years. Age at time of diagnosis increased overtime for craniopharyngiomas, colloid cysts and pinocytomas but remained stable for the remaining tumors. Aside from only a few exceptions, our study demonstrates stability of the various brain tumor types in Jordanians with respect to gender, histological type distribution and age at diagnosis over a long period of time.
Keywords: Brain Tumor; Jordan; Neoplasm; Central Nervous System; Time Trends.

(J Med J 2021; Vol. 55 (4):183-197)

Received *December , 15, 2020*
Accepted *March, 28, 2021*

Brain tumors represent only 2% of all cancers; yet, many brain tumor types are associated with severe disability and high mortality rate (1) In general, there is paucity of information on brain tumor prevalence, especially in developing countries. This is because accurate Population–Based Cancer Registries (PBCR) are difficult to achieve in the setting of economic and political instability, population movements, substandard health care systems and low-quality healthcare records (2). In fact, just 60 reports out of 122 submitted from PBCR in Africa, Asia and Latin America met the international standards to be included in CI5-IX for the period from 1998-2002 (3).

The lack of PBCR and adequate mechanisms for data collection and cancer registration is partly responsible for disparities in cancer control and management (4,5). Brain tumors are of particular concern because of the increase in incidence observed over the last few decades in developed countries, which has been attributed by some investigators to improved diagnostic techniques and, to a lesser extent, greater availability of medical care (6-10).

In Arab Countries, including Jordan limited

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descriptive cancer data is available (11-15). We have previously reported the incidence of brain tumors in Jordanians during the 1981-1990 decade(12). More recently, an epidemiological study of brain tumors in Jordan was also reported by our group (15). However, both studies did not investigate the time trends of brain tumors in the country

In this study, our aim is to investigate the time trends of brain tumors with respect to gender distribution, histological type distribution and age at diagnosis at our center over the period from 1981 and 2011.This is the first study at a leading referral center spanning a three-decade period and including over 1000 brain tumors.

Materials and Methods:

Patients' records from the department of Neurosurgery our hospital between January 1981 to December 2011 were reviewed for all cases with the histological diagnosis of brain tumor, both primary and secondary. Primary brain tumors included those originating from the brain parenchyma, meninges, skull base, cranial nerves and pineal gland while secondary brain tumors included metastasis from various tumor types, such as lung and breast. Excluded from the analyses were cases lacking histopathological diagnosis or those only diagnosed by imaging or at autopsy.

Data of 1036 patients with the histological diagnosis of brain tumor were collected. All cases were re-classified according to the modified World Health Organization (WHO) classifications of central nervous system tumors (16)

Age at tumor diagnosis, gender and histological type were recorded for all patients. The gender distribution, histological type distribution and age at diagnosis were determined for the period between 1981 and 2011. In addition, the time trends of these parameters were determined on a year-by-year basis or on a decade-by-decade basis for this period.

The decade-by-decade analysis was performed for the histological type distribution because of the very low number of yearly cases found for certain histological tumor types. The larger sample sizes available in a decade-based analysis are expected to result in less spurious results.

Data were analyzed with SPSS 17.0 software (SPSS Inc., Chicago, III., USA), origin pro 8.0 (Origin lab corporation, Northampton, USA) and Medcalc software (MedCalc, Ostend, Belgium). Relative frequency rates were presented with 95%CI.

Results:

One thousand and thirty-six brain tumors were seen in the 30-year period. With respect to tumor location,18% of tumors were infratentorial versus 82% supratentorial, with frontal location being the most common. Regarding tumor origin, 965 (93.1%) were primary brain tumors whereas 71 (6.9%) were brain metastasis.

With respect to the histological type, meningioma represented the largest group with 19.9% (n=206), followed by pituitary adenoma with 12.8% (n=133), and low-grade astrocytomas (pilocytic and diffuse astrocytoma group) with 12.6% (n=131) **(Table 1)**.The most common malignant brain tumor types were glioblastoma multiforme (GBM) with 12.3% (n=127) and anaplastic astrocytoma with 8.4% (n=87). Overall, the number of tumors diagnosed at the hospital has been increasing in the last 30 years and this increase was significant in 18 of the 42 types of tumors registered. All of these 18 tumors peaked within the last 13 years (1998-2011) **(Table 1; Figure 1A)**.

This increase in number of tumors was the highest for GBM **(Figure 1C)**. Thorough analysis of the histograms revealed that the overall yearly frequency of cases registered fluctuated over the past 3 decades and peaked during 2 distinctive periods, in 1990-1991 and in 2003-2006 **(Figure 1A)**. This was probably due to the unusual higher number of pituitary adenomas during these two periods **(Figure 1B)**. The presence of these 2 peaks in number of tumors was confirmed statistically by the fact that Lorentizian fitting for 2 peaks provided stronger regression (R^2=0.833) than simple linear fitting (R^2=0.523).The relative frequency of the various tumor types did not differ significantly between the three decades from 1981 to 2011 except for anaplastic astrocytoma where there was a significant decrease (P<0.05) in relative frequency from 18.2% (n=47) during the period from 1982-1991 to 3.9% (n=22) during the period from 2002-2011.

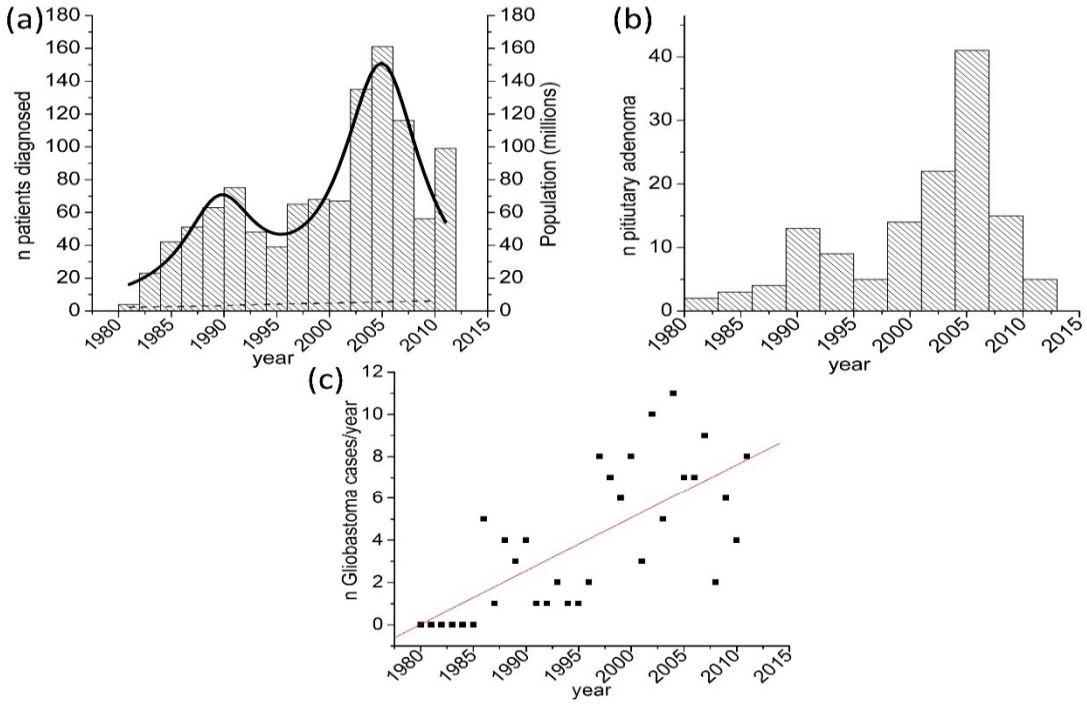

Figure 1: **(a)**: Histogram showing the increase in number of tumors registered over the study period; the slid line represents the Lorentzian fitting of the histogram whereas the dashed line represents the increase in the overall population of Jordan. **(b)**: histogram of the number of cases of pituitary adenomas registered. **(c)**: scatter plot and linear fit for the cases of glioblastoma multiforme (GBM) registered over the study period.

Regarding patient age at time of diagnosis, 790 (71%) were adult brain tumors while 322 (29%) were pediatric tumors. Mean age at diagnosis for all tumors was 35.2 years (95%CI 34.0-36.4) **(Table 2)** with a peak tumor incidence in children at 5-9 years and in adults at 50-54 years **(Figure2)**.

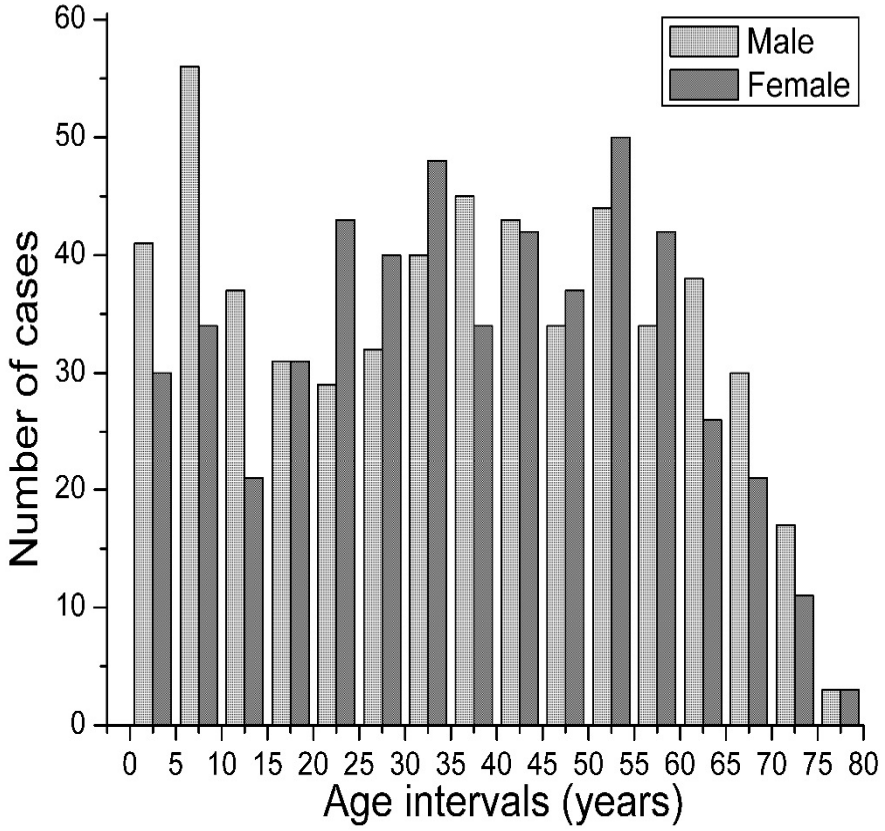

Figure 2: Histograms representing the number of cases registered according to the age of the patients at time of diagnosis for both female and male patients.

Mean age at diagnosis for all tumor types combined was stable over the 30-year study period **(Figure 3).** Moreover, age at diagnosis was stable for all histological types except for craniopharyngioma, colloid cyst and pinocytoma, which presented at later age over time (**Table 2)**.

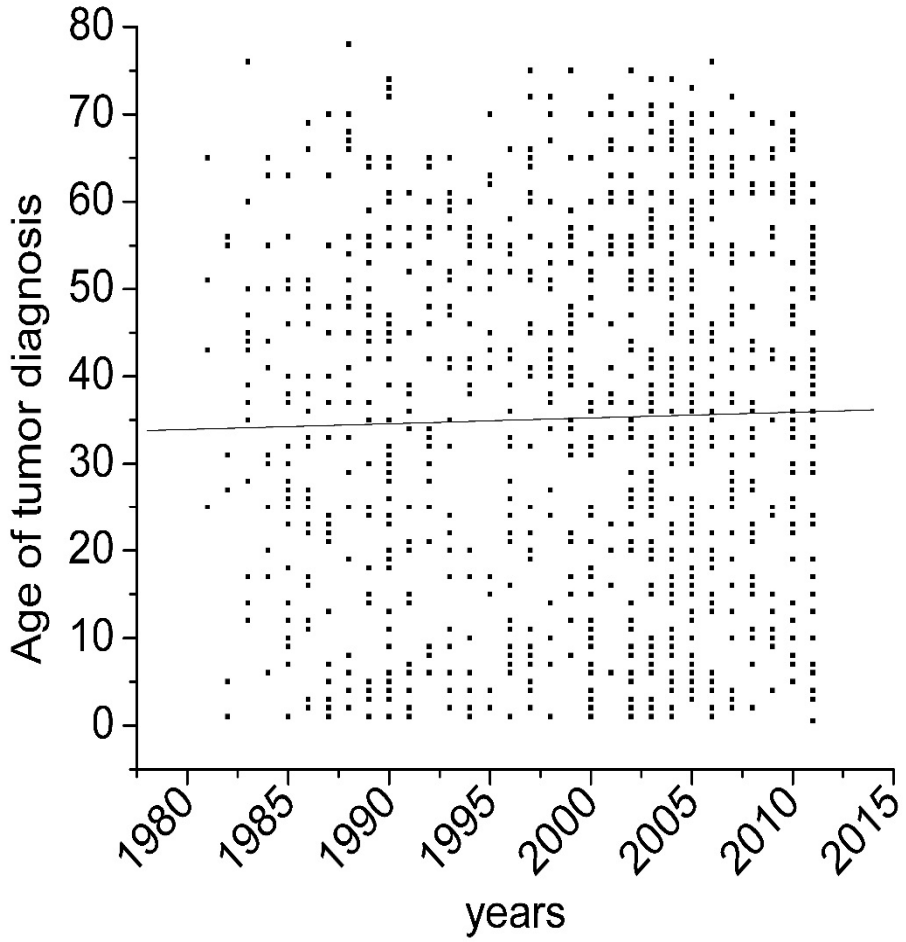

Figure 3: Scatter plot and linear fit showing age at diagnosis of brain tumors over time for all brain tumors.

For craniopharyngioma, there was a statistically significant increase in age at diagnosis of 0.287 per year over the 30-year period (P=0.008), for colloid cysts this was 0.207 per year (P=0.013) and for pinocytoma 0.190 per year (P=0.037) **(Figure 4)**.

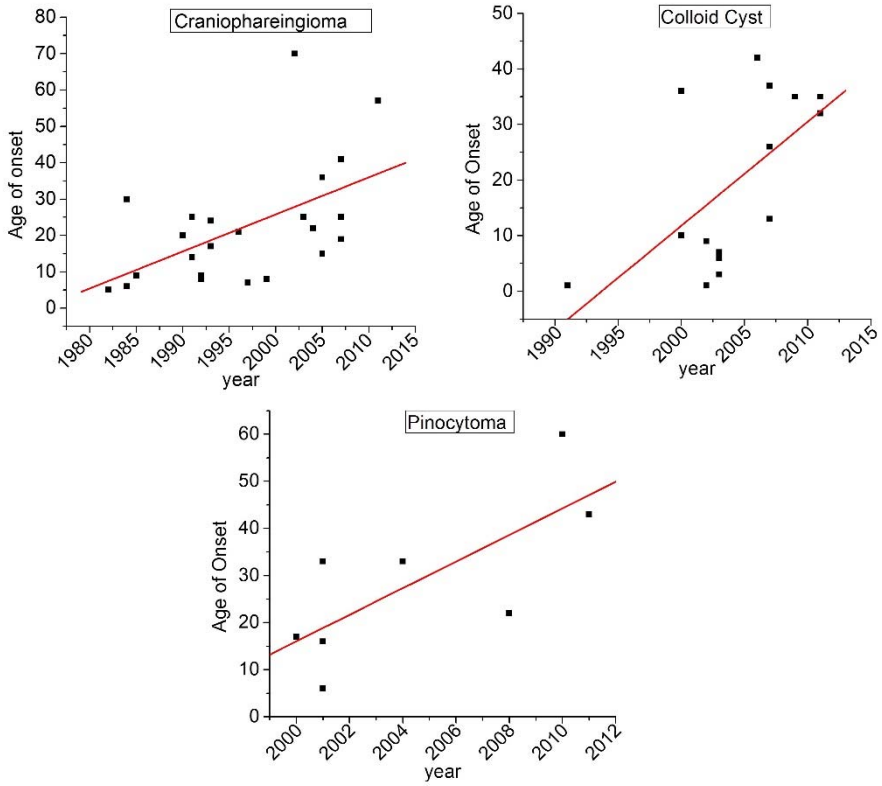

Figure 4: The trends of age at diagnosis of craniopharyngeoma, colloid cysts and pineocytoma. The scatter plots represent the age of the patients at the time of diagnosis as a function of the year in which the diagnosis was registered. The solid lines represent the liner fit of the scatter plots.

The gender distribution of all tumor types and its rate of change over the 30-year period were examined. A slight male predominance (52%; 95%CI 50-55%, P< 0.05) was found for the entire study period and for all tumors combined **(Table 3)**. More pronounced male predominance was found for GBM (65%; 95%CI 57-74%, P=0.004), anaplastic astrocytoma (61%; 95%CI 50-71%, P< 0.015) and oligodendroglioma (78%; 95%CI 50-55%, P= 0.035). Female predominance was found for meningioma (38% male; 95%CI 32-45%, P=0.016) and pinocytoma (13% male; 95%CI 17-42%, P=0.04). Similar gender distribution with no predominance of either gender was found for all other tumor types.

The gender distribution was stable for all histological types over the entire 30-year period (**Table 3**). MOVE TABLE 3 FROM HERE TO BE AFTER TABLE 2 BRLOW

Table 3. Gender distribution of the different types of brain tumors registered and the rate of change in gender distribution over time

Type of Tumor	Sex(n)		% Male	Rate of change (n tumor/year)		
	Female	Male		B(95%CI)	P	R
Neuroepithelial tumours						
Pilocytic and diffuse astrocytoma	65	66	50(42-59)	1.08(-1.46-3.63)	0.074	0.401
Anaplastic astrocytoma	34	53	61(50-71)*	0.28(-3.70-4.25)	0.015	0.89
Glioblastoma	44	83	65(57-74)*	0.06(-2.49-2.61)	0.004	0.964
Gliomatosis cerebri	0	1	na	na	na	na
Oligodendroglioma	4	14	78(57-99)*	-7.79(-18.64-3.06)	0.035	0.148
Ependymoma	13	8	38(15-61)	3.18(-3.56-9.92)	0.221	0.335
Choroid plexus cyst	0	1	na	na	na	na
Choroid plexus papilloma	0	3	na	na	na	na
Neuronal and mixed neural-glial tumours						
Dysembryoplastic Neuroepithelial Tumour(DNET)	2	2	50(-42-142)	-1.50(-3.65-0.65)	0.905	0.95
Ganglioglyoma	4	3	43(-7-92)	-0.92(-4.36-2.53)	0.292	0.525
Central Neurocytoma	2	5	71(26-117)	-1.30(-5.06-2.46)	0.135	0.415
Neuroglial cyst	1	0	na	na	na	na
Tumours of the pineal region						
Pinocytoma	7	1	13(-17-42)*	6.29(-4.78-17.35)	0.049	0.214
Pinoblastoma	1	0	na	na	na	na
Emberyonal tumours						
Medulloblastoma	26	40	61(49-73)	-1.35(-5.50-2.80)	0.081	0.518
Primitive Neuroectodermal Tumour(PNET)	2	5	71(26-117)	0.20(-15.15-15.55)	0.015	0.975
Tumours of Cranial nerve						
Schwannoma	11	14	56(35-77)	0.64(-6.53-7.81)	0.039	0.854
Tumours of Meningothelial cells						
Meningioma	127	79	38(32-45)*	0.29(-0.21-2.69)	0.016	0.841
Mesenchymal Tumours						
Chondrosarcoma	0	2	na	na	na	na
Sarcoma	2	0	na	na	na	na
Fibrous dysplasia	0	3	na	na	na	na
Osteoma	4	2	33(-21-88)	-2.3(-17.2-12.7)	0.204	0.698
Haemangioma	1	5	62(31-92)	3.20(-4.63-11.07)	0.491	0.322
Other Neoplasms related to Meninges						
Hemangioblastoma	4	3	43(-7-92)	4.67(-3.02-12.36)	0.572	0.179
Lymphoma	2	6	75(36-114)	5.50(-3.07-14-07)	0.54	0.168
Germ Cell Tumours						
Germinoma	0	4	na	na	na	na
Choriocarcinoma	2	0	na	na	na	na
Tumours of sellar region						
Pituitary Adenoma	71	62	47(38-55)	0.63(-1.79-3.05)	0.045	0.608
Craniopharyngioma	13	11	46(24-67)	-1.52(-9.03-5.98)	0.089	0.678
Rathke cyst	1	1	na	na	na	na
Cystic Lesions						
Colloid Cyst	7	7	50(20-80)	1.27(-4.63-7.20)	0.135	0.644
Epidermoid cyst	4	5	56(15-96)	-3.6(-10.8-3.5)	0.415	0.266
Dermoid cyst	3	4	57(8-107)	-4.58(-17.71-8.54)	0.373	0.41
Other lesions						
Cavernoma	3	4	57(8-107)	-0.17(-2.90-2.56)	0.07	0.881
Langerhans histiocytosis	2	1	na	na	na	na
Eosinofilic granuloma	1	1	na	na	na	na
Hyalinized fibrous tissue	0	1	na	na	na	na
Histocytosis	0	1	na	na	na	na
Glmous	1	0	na	na	na	na
Metastasis	39	32	45(33-57)	-0.958(-4.67-2.76)	0.062	0.609
Total	503	533	52(50-55)*	0.38(-0.56-1.33)	0.024	0.429

*: significant difference between males and females. §: change in males-to-females proportion is significant.

Discussion:

This study is the first in Jordan that includes more than one thousand brain tumors seen during a three-decade period at a single hospital.

About ninety-three percent of the brain tumors in our study were primary brain tumors and only 6.9% were secondary brain tumors. The percentage of brain metastasis differs between hospitals depending on the patient population managed at each hospital and diagnostic approaches used to identify brain metastases. However, our data is in agreement with that of other studies where the rate of secondary brain tumors ranged from 6% to 16 % (17-23).

In our study, the most common primary brain tumor type was meningioma (19.9%) consistent with the findings of other studies in various countries (4,10,15,18, 24-27). The relative frequency of pituitary adenoma (12.8%) is also similar to that reported by other groups ranging from 8% to 20% (21-22, 28). Similar to the findings of other studies, GBM and anaplastic astrocytoma represented the most common malignant primary tumor types (24,28-29) .

Our finding of a significant decrease in the relative frequency of anaplastic astrocytoma over the years along with an increase in the relative frequency of GBM is likely related to a more frequent diagnosis of GB in samples previously labeled as anaplastic astrocytoma. This is presumably related to the establishment of a neuropathological unit in our department two decades ago with stricter application of criteria for differentiating between anaplastic astrocytoma and GBM.

In absolute numbers, 18 out of the 42 types of tumors diagnosed have increased over the years, probably due to the increase in population. However, it was interesting to observe that the number of cases registered at our hospital peaked in two distinctive periods of time, once in the early nineties (1990-1991) and again in the mid 2000's (2003-2006), and this was most obvious in the case of pituitary adenomas. It is worth mentioning that these 2 periods of time coincide with 2 very significant events that affected the country and the region, which are the first and second gulf war. Future studies should investigate the increase in certain tumors in Jordan during the 2 gulf war periods.

The relative frequency of pediatric tumors of 29% found in our study is substantially higher than that reported in developed countries ranging from 8 to 20% (8,18,28). This finding is related to demographic differences between Jordan and developed countries where the median age of Jordanian population is just 21 years (29). Indeed the mean age at time of diagnosis in our study was younger than in other populations (4,23) . In our study this age was 35.2 years, which is similar to that found in our epidemiologic study of primary brain tumors in Jordan where the mean age at diagnosis was 39.4 years (15). However, this age is significantly younger than that found in developed countries where the mean age at diagnosis was between 52.5 and 54 years (8,18). Interestingly, Nomura et al. in Japan has reported an increasing age at tumor presentation from 45-49 years from 1969-1978 to 60-64 years from 1979-1983 (20) . Our finding of younger age at presentation compared with developed countries is likely related to demographic differences between Jordan and developed countries where the mean age of Jordanian population is much younger than that in these countries (29). Nevertheless, during the study period, the age at diagnosis of craniopharyngiomas, colloid cysts and pinocytomas increased overtime. All these

tumors can appear at a wide range of ages ranging from early childhood up to late adulthood, however they have higher prevalence in older age groups (30-32). This is probably why as the population in Jordan has been growing older, a shift towards a higher number of adult cases has been observed.

Over the 30-year study period, our study found a slight male predominance (1.08:1) for all brain tumors combined, which is similar to other studies (4,9,17,20), more specifically for GB and oligodendrogliomas. However, this contrasts with the lack of gender difference in the incidence of brain tumors found in the systematic reviews and meta-analyses of the worldwide incidence and female predominance of primary brain tumors found in other studies (15,18,24-25).The reason for this discrepancy is likely related to the fact that our study is not a countrywide epidemiologic study but rather including patients from only a single institution. However, it should be noted that the male predominance found in our study was only modest with significant difference noted just at less than 0.05 level. Over the 30-year study period, meningiomas and pinocytomas were more predominant in females, whereas GBM and oligodendroglioma were more predominant in males, and this is in agreement with previous studies (21,33-35). Interestingly, the gender distribution was stable for all histological types over the 30-year study period.

Our study has significant strengths and some limitations. A major strength of our study is that there was histological confirmation of diagnosis in all patients, which is not the case for many previously published studies in this field where pathological confirmation varied widely from only 35% to 69% (28,36-38). Another strength is the relatively large number of patients accrued over the 30-year study period enabling us to examine the time trends of these tumors with respect to various parameters, such as gender distribution, histological type distribution and age at diagnosis with statistically significant findings revealed. Limitations of our study include its retrospective nature and that it does not include survival data on the treated patients.

Conclusions:

Our study is the first at a major national academic referral center in Jordan investigating time trends of gender distribution, histological type distribution and age at diagnosis of brain tumors over a three-decade period. Aside from only a few exceptions, our data demonstrate stability of the various brain tumor types with respect to gender distribution, relative frequency and age at diagnosis over a long time period. This study provides valuable information for a better understanding of brain tumors in Jordan, which may then be compared with that in other developing and developed countries. Future studies should include data on patient follow-up to enable survival analysis.

Notes

The authors (Ahmad F. Tamimi, Malik E. Juweid, Aws M. Husein, Fatima Obeidat, Qussay Salih and Faleh Tamimi) declare no conflict of interest. Faleh Tamimi acknowledges support from the Canada Research Chair Tier-2 program and the Réseau de recherche en santé buccodentaire et osseuse (RSBO).

Table 1. The different types of tumors diagnosed during the study period (1981-2011), the year in which the frequency of each tumor peaked and the change in their yearly frequency.

Type of Tumor	n	Peak (year)	Rate of change (n tumor/year)		
			B (95%CI)	R	P
Neuroepithelial tumours					
Pilocytic and diffuse astrocytoma	131	1999.0±7.4	0.133±0.058	0.403	0.030*
Anaplastic astrocytoma	87	1993.6±9.1	-0.062±0.051	-0.217	0.234
Glioblastoma	127	2001.0±6.9	0.252±0.046	0.705	<0.001*
Gliomatosis cerebri	1	2011 na	0.006±0.003	0.301	0.090
Oligodendroglioma	18	2000.4±9.4	0.033±0.019	0.302	0.093
Ependymoma	21	1995.9±7.2	0.003±0.021	0.027	0.885
Choroid plexus cyst	1	2002 na	0.002±0.003	0.126	0.491
Choroid plexus papilloma	3	1998.0±1.7	0.003±0.008	0.066	0.719
Neuronal and mixed neural-glial tumours					
Dysembryoplastic Neuroepithelial Tumour(DNET)	4	2005.8±1.0	0.017±0.008	0.359	0.047*
Ganglioglyoma	7	2003.9±1.7	0.022±0.010	0.377	0.037*
Central Neurocytoma	7	2004.6±1.7	0.023±0.009	0.445	0.011*
Neuroglial cyst	1	2011 na	0.006±0.003	0.301	0.094
Tumours of the pineal region					
Pinocytoma	8	2004.5±4.5	0.026±0.011	0.398	0.020*
Pinoblastoma	1	2011	0.006±0.003	0.301	0.090
Emberyonal tumours					
Medulloblastoma	66	1996.2±8.2	0.017±0.039	0.078	0.670
Primitive Neuroectodermal Tumour(PNET)	7	2000.1±6.5	0.012±0.008	0.266	0.141
Tumours of Cranial nerve					
Schwannoma	25	1999.4±8.4	0.035±0.016	0.366	0.039*
Tumours of Meningothelial cells					
Meningioma	206	1998.0±8.5	0.189±0.071	0.435	0.013*
Mesenchymal Tumours					
Chondrosarcoma	2	1999.5±9.2	0.003±0.005	0.112	0.542
Sarcoma	2	1990.0±0.0	-0.002±0.003	-0.107	0.560
Fibrous dysplasia	3	2010.7±0.6	0.011±0.004	0.420	0.017*
Osteoma	6	2001.5±5.7	0.008±0.009	0.165	0.366
Haemangioma	6	2004.7±2.7	0.020±0.008	0.401	0.023*
Other Neoplasms related to Meninges					
Hemangioblastoma	7	2007.0±4.4	0.030±0.009	0.501	0.004*
Lymphoma	8	2002.6±4.7	0.021±0.015	0.244	0.178
Germ Cell Tumours					
Germinoma	4	1999.3±7.8	0.006±0.007	0.153	0.402
Choriocarcinoma	2	1990.0±0.0	-0.004±0.007	-0.107	0.560
Tumours of sellar region					
Pituitary Adenoma	133	2000.5±7.0	0.238±0.072	0.522	0.002*

Type of Tumor	n	Peak (year)	Rate of change (n tumor/year)		
			B (95%CI)	R	P
Craniopharyngioma	24	1996.9±8.7	0.012±0.016	0.135	0.460
Rathke cyst	2	2005.0±1.4	0.007±0.005	0.266	0.140
Cystic Lesions					
Colloid Cyst	15	2004.1±5.1	0.036±0.016	0.387	0.030*
Epidermoid cyst	9	2000.2± 4.6	0.016±0.010	0.280	0.121
Dermoid cyst	7	2001.7±6.6	0.016±0.010	0.271	0.134
Cavernoma	7	2009.6±1.3	0.036±0.010	0.557	0.001*
Langerhans histiocytosis	3	2010.7±0.6	0.017±0.007	0.401	0.023*
Eosinofilic granuloma	2	1993.5±9.2	-0.003±0.003	-0.165	0.366
Hyalinized fibrous tissue	1	2010 na	0.005±0.003	0.282	0.118
Histocytosis	1	2009 na	0.005 0.003	0.262	0.145
Glmous	1	2011 na	0.006±0.003	0.301	0.090
Cortical dysplasia	2	2009.5± 0.7	0.010±0.004	0.392	0.027*
Metastasis	71	1998.6±7.8	0.081±0.029	0.459	0.008*

B ; (slope), R; (regression coefficient) and P; (P value). *: change is significant.

Table 2;Mean age at time of diagnosis for each type of tumor over the study period and the change of patients' age at time of diagnosis overtime

Type of tumor	Mean Age	Rate of change		
	year (95% CI)	B (95%CI)	R	P
NeuroepithelialTumours				
Pilocytic and diffuse Astrocytoma	29.6(26.3-32.8)	0.018(-0.054-0.090)	0.044	0.625
Anaplastic Astrocytoma	37.7(33.1-42.2)	-0.006(-0.098-0.087)	0.015	0.89
Glioblastoma	49.6(46.2-52.3)	0.04(-0.04-0.12)	0.094	0.312
Gliomatosiscerebri	46	na	na	na
Oligodendroglioma	31.7(22.5-40.9)	0.089(-0.20-0.378)	0.355	0.148
Ependymoma	18.0(10.4-25.5)	0.037(-0.181-0.255)	0.221	0.335
Coroid plexus papilloma	3.6(-1.8-8.3)	-0.279(-4.885-4.327)	0.61	0.582
Choroid plexus cyst	2	na	na	na
Neuronal and mixed neural-glial tumours				
Dysemberyoblasticneuroepithelialtumour(DNET)	6.0(2.3-9.7)	-0.375(-0.91-0.16)	0.905	0.095
Central Neurocytoma	25.6(20.0-31.1)	0.096(-0.214-0.406)	0.335	0.463
Ganglioglyoma	11.4(0.4-22.4)	-0.065(-0.209-0.078)	0.464	0.294
Neuroglial cyst	1	na	na	na
Tumours of the pineal region				
Pinocytoma	28.8(14.3-43.2)	0.19(0.02-0.37)*	0.738	0.037*
Pinoblastoma	56	na	na	na
Emberyonaltumours				
Medulloblastoma	13.4(10.2-16.6)	0.06(-0.10-0.22)	0.09	0.466

Type of tumor	Mean Age	Rate of change		
	year (95% CI)	B (95%CI)	R	P
Primitive Neuroectodermaltumour(PNET)	21.7(0.5-42.9)	0.181(-0.07-0.433)	0.637	0.124
Tumours of Cranial nerve				
Schwannoma	37.8(30.4-45.3)	-0.015(-0.277-0.198)	0.03	0.888
Tumours of Meningothelial cells				
Meningioma	45.3(43.1-47.6)	0.04(-0.03-0.12)	0.075	0.29
Mesenchymal Tumours				
Chondrosarcoma	36.5(-20.7-93.7)	-1.44(-1.44- -1.44)	1	na
Osteoma	28.4(6.8-50.0)	0.057(-0.589-0.703)	0.16	0.798
Sarcoma	31.5(-13.0-76.0)	na	na	na
Haemangioma	41.5(28.6-54.4)	0.082(-0.173-0.338)	0.509	0.381
Bony cyst	15	na	na	na
Fibrous dysplasia	19.0(-8.3-46.3)	0.045(-0.288-0.379)	0.866	0.333
Other Neoplasm related to Meninges				
Hemangioblastoma	41.5(28.6-54.4)	0.014(-0.311-0.339)	0.08	0.899
Lymphoma and Haematopoietic Neoplasm				
Lymphoma	51.3(34.0-68.7)	0.037(-0.377-0.45)	0.122	0.819
Germ Cell Tumours				
Germinoma	30.6(-10.5-71.0)	-0.28(-0.645-0.085)	0.919	0.081
Choriocarcinoma	23.5(17.2-29.9)	na	na	na
Tumours of the Sellar Region				
Pituitary Adenoma	37.3(35.0-39.7)	0.05(-0.04-0.15)	0.11	0.237
Craniopharyngioma	22.3(15.7-29.3)	0.29(0.09-0.49)*	0.541	0.008*
Rathke cyst	37.5(18.4-56.6)	-0.67(-0.67- -0.67)	1	na
Cystic Lesions				
Colloid Cyst	19.5(11.0-28.0)	0.21 (0.05-0.36)*	0.622	0.013*
Epidermoid cyst	25.1(12.2-38.1)	0.06(-0.18-0.30)	0.214	0.58
Dermoid cyst	31..4(7.9-54.9)	-0.15(-0.39-0.99)	0.565	0.186
Others				
Cavernoma	22.7(8.8-36.7)	0.06(-0.01-0.13)	0.678	0.094
Langerhans histiocyt	21.3(-21.1-63.8)	0.02(-0.33-0.37)	0.574	0.611
Cortical dysplasia	16.0(-72.9-104.9)	0.07(0.07-0.07)	1	na
Eosinofilic granuloma	16.0(-98.4-130.4)	0.72(0.72-0.72)	1	na
Hyalinized fibrous tumor	22	na	na	na
Histocytosis	24	na	na	na
Glmous	4	na	na	na
Metastasis	49.6(46.4-52.8)	0.098(-0.043-0.24)	0.004	0.609
Total	35.2(34.0-36.4)	0.011(-0.013-0.035)	0.27	0.386

*: change in age of onset is statistically significant ($p<0.05$)

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الأتجاهات الزمنية ل ألأورام الدماغية في ألأردن من حيث العمر و الجنس و تشخيص الأنسجة

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الملخص

هنالك القليل من المعلومات حول الأورام الدماغية في البلدان العربية بما في ذلك الأردن باستثناء بعض المعلومات الوصفية. لقد قمنا في هذة البحث بدراسة اتجاهات ألأورام الدماغية من حيث الأعمار و الجنس و نوع الأورام حسب التحليل المخبري للأنسجة و ذلك في مؤسستنا في الفتره الزميه ما بين 1981–2011. وقد وجدنا اكثر تواجدا ل ألأورام الدماغية عند الذكور(52%, P< 0.05) خلال هذه الدراسة و بشكل خاص في حالات الورم ال أرومي الدبقيو الورم النجمي الكشمي و الورم النجمي و ورم الدبقيات القليلة التغصن . بينما كان هنالك تواجد اكثر عند الأناث في حالات اورام السحايا و ورم الغدة الصنوبرية. ان توزيعه ألأورام حسب الجنس كانت مستقرة على مدار الثلاثين عام من فترة الدراسة باستثناء ألورم النجمي الكشمي. و وجدنا ايضا زيادة في تشخيص 18 نوع من الأورام من المجموع الكلي وهو 42 ورم دماغي مشخص في هذه الدراسه.

الكلمات الدالة: الأورام الدماغية. الأورام .الجهاز العصبي المركزي . الاتجاهات.