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Pattern of Brain Neoplasm in Khyber Pakhtunkhwa and Afghani Refugees. Hospital Based Descriptive Retrospective Study

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Abstract

The term "brain tumor" refers to a set of neoplasms, every single with its own biology, prognosis and treatment; these tumors are well recognized as "intracranial neoplasms"; since some of them didn't arise from brain tissue (e.g., meningioma's and lymphomas). Childhood neoplasms are the second most common cause of death after trauma. This study aimed to determine the Frequency and pattern of brain neoplasm in Khyber Pakhtunkhwa and Afghani refugees through hospital based data from 2012 to 2016. This was Hospital based Descriptive Retrospective study. Study setting was (Institute of Radiation & Nuclear Medicine (IRNUM) Peshawar Pakistan. Data were collected from 2012-2016. Cases of primary brain tumor, of both genders and all age groups were included in the study. And cancers other than brain tumor and those having inflammatory lesion of the brain. Cases with incomplete data were excluded. Data was analyzed by using statistical package (SPSS version 23.0. A total of 765 Cases enrolled in study having complete data and were analyzed over a period of five years. Of those 765 cases 197 were Female patients 357 were males and 212 pediatric patients. Male to Female ratio is 4:2. Study mean age for adults was 38.07 ± 15.02 and for pediatrics mean age was 8.72 ± 3.36. Majority of neoplasms in adult was GBM followed by astrocytoma and subtypes of gliomas while in pediatric most of the cases were medulloblastoma followed by gliomas. There was correlation b/w age and disease stage as (p<0.01). This study revealed the distribution of brain tumors in patients attending our institution. The results obtained were comparable with available worldwide data. Majority of the cases were in stage 2 followed by stage 4 and stage 3.

Keywords: Khyber pakhtunkhwa; Afghani refugee's; Neoplasm; GBM; Astrocytoma; Medulloblastoma; Glioma

Introduction

The term "brain tumor" refers to a set of neoplasms, every single with its own biology, prognosis and treatment; these tumors are well recognized as "intracranial neoplasms"; since some of them didn't arise from brain tissue (e.g., meningioma's and lymphomas) [1].

Tumors of the nervous system constitute 1%-2% tumors in adults (About 2,57,000 cases per year world-wide); the incidence does not vary markedly between regions or population Metastatic brain tumors the foremost common intracranial neoplasms in adults and a big reason for morbidity and mortality [2,3]. The incidence of primary brain tumor is increasing over the last many decades; particularly in older adults supported the report of central brain tumor registry of the United States (CBTRUS). The annual incidence of tumors of the central nervous system ranges from 10 to 17 per 100,000 persons for intracranial tumors and 1 to 2 per 100,000 persons for intra spinal tumors; the bulk of those are primary tumors, and only one fourth to at least one half is metastatic in nature .

Prevalence is that the best indicator of cancer survivorship within the population, however few studies have targeted on tumor prevalence attributable to previous information limitations [4].

The aim of our study is to systematically review the frequencies of different types of brain cancer and their demographics including age, sex and different regions in KPK from 2012 to 2016. Also to identify the pattern and distribution of brain tumor among the Khyber Pakhtunkhwa population and we need to know the load of the disease so appropriate measure could be taken and we would be capable to move our possessions towards this unkempt side of neurosurgical diseases. Thus, this study aimed to determine the Frequency and pattern of brain neoplasm in Khyber Pakhtunkhwa and Afghani refugees through hospital based data from 2012 to 2016.

Materials and Methods

This was Hospital based Descriptive Retrospective study. Study setting was (Institute of Radiation & Nuclear Medicine (IRNUM) Peshawar Pakistan. As the study was descriptive retrospective study design and is based on hospital records, the total number of registered cases between 2012 till 2016 was retrieved from the hospital. Therefore, no sample size calculations were done. Non-probability Purposive sampling technique were Used. All registered cases of primary brain tumor, of both genders and all age groups were included in the study. Cancers other than brain tumor and those having inflammatory lesion of the brain were excluded. Cases with incomplete data were excluded.

Approval was obtained from Ethical Review Board of Research Center of IRNUM. Permission was obtained from the Medical director of the IRNUM hospital as well as from the head of the department for the use of their data for research purpose only. After approval the hospital data was be carefully retrieved from the hospital records with basic information such as age, gender, place of residence, tumor site, and stage. This was done for a period of 5 years starting from January 2012 till December 2016. No personal information will be collected during the data collection and strict confidentiality will be maintained.

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Results

Data was analyzed by using statistical package (SPSS version 23.0). In this descriptive retrospective study, a total of 765 Cases enrolled in study having complete data and were analyzed over a period of five years. Of those 765 cases 197 were Female patients 357 were males and 212 pediatric patients. Most of the cases or patients within five years were in males compared to females as Male to Female ratio is 4:2 as shown in (Figure 1).

The mean age score for female patients was 36.92 ± 14.85 with a minimum age of 14 Years and maximum age of 74 Years. A total of 357 Males patients having a minimum age of 15 Years and a maximum age of 80 Years with a mean age of 39.22 ± 15.18 as well as a total of 212 pediatric Patients having minimum age of 2 and a maximum age of 16 with a mean age of 8.72 ± 3.6. Among them Glioblastoma multiformis, (GBM) was the highest cases in males & females. About 42 (21.42%) in Females and 116 (32.5%) in Males followed by Astrocytoma 35 (17.76%) in females and 60 (16.80%) followed by Oligodendroglioma 15 (7.62%) in females and 32 (8.96%) in males followed by Glioma 10 (5.07%) in females and 32 (7.28%) in males followed by Ependymoma 14 (7.11%) in females and 13 (3.64%) in males followed by Meningioma 11 (5.59%) in females and 7 (1.97%) in males followed by medulloblastoma 8 (4.06%) in females and 8 (2.24%) in males followed by anaplastic astrocytoma 7 (3.55%) in females and 6 (1.69%) in males [5].

About 43 (20.29%) cases in pediatric patients were medulloblastoma followed by Brain Stem Glioma 42 (19.81%) followed by Ependymoma 21 (9.91%) followed by Glioblastoma multiformis (GBM) 19 (8.96%) followed by Glioma 13 (6.13%) followed by Astrocytoma 12 (5.67%) as shown in (Figure 2).

Among the following cancer types the most common site involved was the Cerebrum followed by Parietal and Temporal lobes. Majority of the tumors involved two or more lobes. The least affected areas were Occipital followed by Thalamus and Midbrain.

Of the Most Tumors in Male 25 (7%) were in stage 1 followed by 144 (40.1%) in stage 2 followed by 57 (15.9%) in stage 3 and 132 (36.8%) were in stage 4, while in females 15 (7.8%) were in stage followed by 86 (44.6%) in stage 2 followed by 41 (21.2%) in stage 3 and 51 (26.4%) in stage 4 and in pediatric cases 10 (4.7%) were in stage 1 followed by 113 (53.6%) in stage 2 followed by 50 (23.7%) in stage 3 and 38 (18%) in stage 4 as shown in (Figure 3). shows Stage-Wise distribution among Genders and pediatrics

As the mentioned hospital was government setup and there wasn't advance registration/Record system, so we collected only complete files
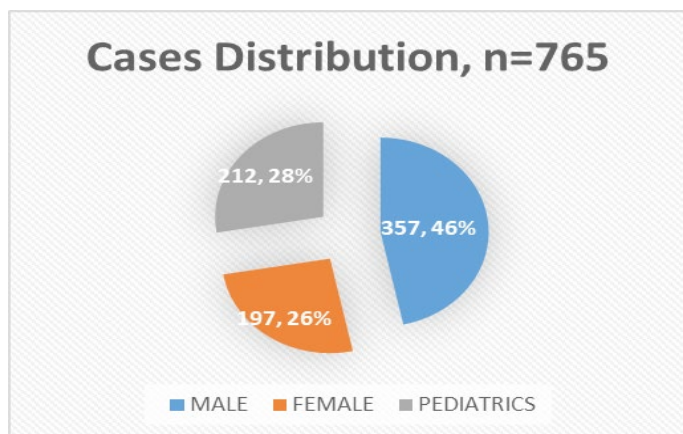

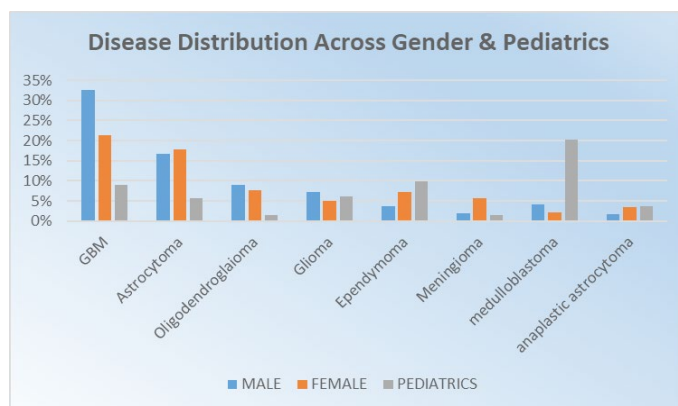Figure 1: Cases distribution across genders and pediatrics.

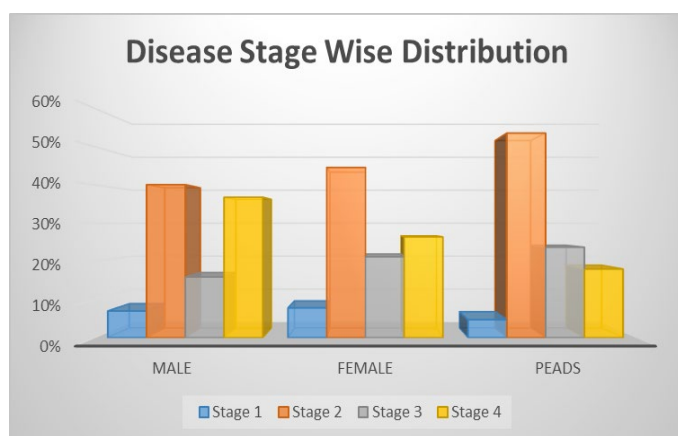Figure 2: Disease distribution across genders and pediatrics.

Figure 3: Stage wise distribution of disease across genders and pediatrics.

records. A total of 357 Males were admitted in 5 years Followed by Pediatric cases 212, whereas a total of 197 cases were females. Yearly distribution of Brain Neoplasm across the gender wise Data as shown in (Figure 4).

Correlation b/w age and disease stages

Excluding pediatric cases age were correlated with advancing the disease stage and found which show moderate correlation b/w age and disease staging as the value of Correlation coefficient are (Pearson R= 0.315, P< 0.01)

Data were also calculated for region wise distribution to look for highest number of cases and found that majority of Neoplasm Cases that was admitted in current time period of study were Afghani refugee's followed by Khyber-Pakhtunkhwa cases as shown in (Figure 5).

Discussion

Brain Neoplasms are the most common solid neoplasms that affect every person irrespective of their age gender and region with variations. Due to lack of complete registration and proper follow-up as well an advance data entry system in our setups of these neoplasms the exact burden of such diseases goes unnoticed and is underestimated in the developing countries like Pakistan. As due to crisis in Afghanistan and lack of advance facilities for diagnosing and treating such type of Brain Neoplasms their patients flow to Pakistan and nearest to border is KPK for better treatment. In Peshawar city there's a lot of Afghani Refugee's living in. The current study was designed to segregate pediatric brain tumors from adult tumors and to determine the frequency of these
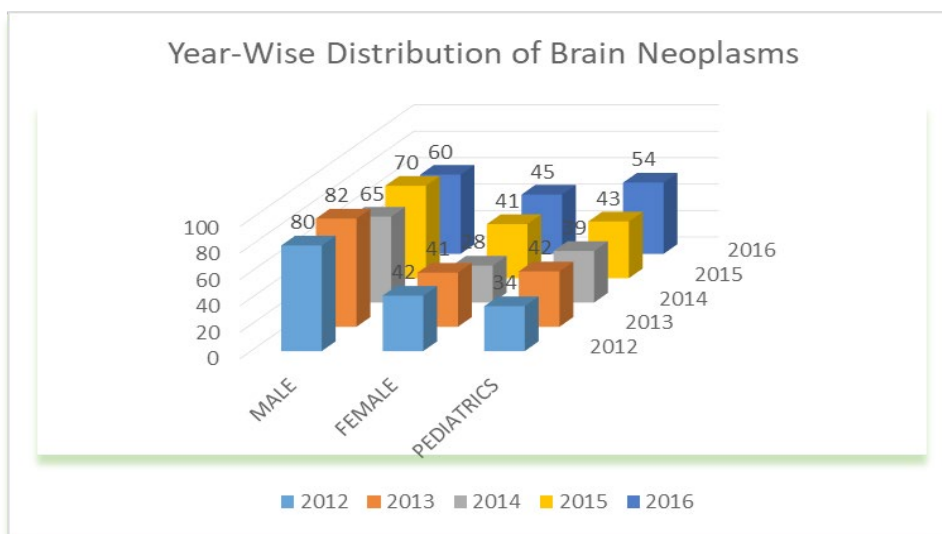
Figure 4: Year wise distribution of disease across genders and pediatrics.
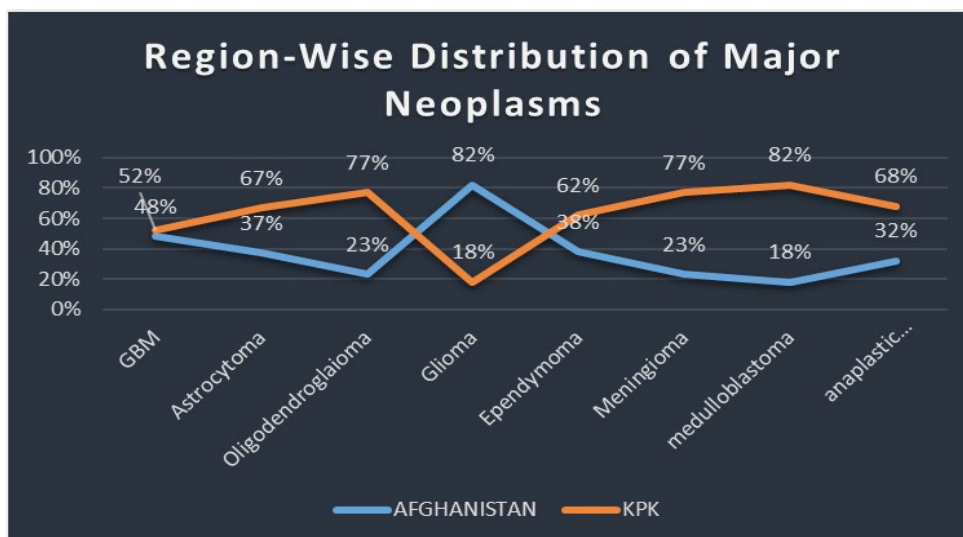

Figure 5: Region wise distribution of major neoplasm.

tumors. This study is essential for ascertaining the required healthcare infrastructure in the management of these diseases and for assessing geographical differences in their molecular and genetic profiles.

We compared our study with National and international studies. In Our study a total of 765 patients within five years were enrolled for analysis. Comparatively a study by Sing, S et al and Ekpene U et al in which he conducted a study for a period of 12 Years and 5 years. Comparing our Male to female ratio another study by S H Wilne et al as there was (4:3) [6,7]. In our study mean age for adults was 38.07 ± 15.02 and for pediatrics mean age was 8.72 ± 3.36 a study by Sajjad et al mean age was 30.68 ± 17.71 and for pediatrics 7.4 ± 2.26. (7, 8). In current study most of the brain neoplasm were GBM in contrast study by Ostrom, Q. T et al having higher cases of glioblastoma in adults. Similarly, a study conducted by Porter K B et al in which Glioblastoma (53.5%) were more the half followed by astrocytoma (7.1%) followed by glioma (6.9%) and then anaplastic astrocytoma (6.8%). (9) Another study conducted by Jain C et al in which astrocytoma was the most common brain tumor followed by meningioma's and the third common

tumor was oligodendroglioma which is also the third common tumor in our study.

Similar to pediatric cases a study conducted by Kumar, L.P et al in which (62.3%) cases having classic medulloblastoma which is also high in current study.

Conclusion

Most of the brain neoplasm was glioblastomas and subtypes in adults followed by astrocytoma and in pediatric cases medulloblastoma were the most common neoplasm followed by gliomas up to age of 14years. In the current 5-year study male cases were more than female. Majority of the cases were in stage 2 followed by stage 4 and stage 3. There was statistical significant correlation between age and advancing disease stage.

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Conflict of Interest

The authors carry no conflict over the submission of the article to the mentioned journal.

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