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Epidemiological and Anatomopathological Aspects of Tumors of the Central Nervous System at the Pasteur Center in the City of Yaoundé- Cameroon

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ABSTRACT

Though most tumors of the central nervous system are benign, they still cause substantial mortality. The frequency of these tumors are high in industrialized countries due to the development of medical imaging and environmental factors.

In Africa, these tumors remain mysterious. In order to fill the gap, we have undertaken a study that went on during five years. **Methodology**: It was a retrospective and descriptive study carried out at the Pasteur Center in the city of Yaoundé-Cameroon for five years. **Results:** We enrolled 79 cases with a sex ratio of 1, 32% in favor of women. 17, 72% of the study participants were children.89% of the tumors were intracranial. Meningiomas were the most frequently found tumors in females while glial tumors were the most frequent in males. 93, 67 % of the tumors observed were primary and 37% of glial tumors were glioblastomas.

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INTRODUCTION

Tumors of the central nervous are relatively frequent in the United State of America (USA) with over forty thousand cases a year (40,000). Despite the fact than half of them are benign, they can cause substantial mortality [1]. Though it has been well documented that some inherited syndromes causes brain tumors (Turge Weber syndrome, Von R Neurofibromatosis), other environmental factors also contributes to it development (irradiation, eating habits, nitrosamines, organophosphorus, electromagnetic waves [2].

The symptoms of the disease are as follows: Headache, psychological instability and modification of the mental state. Radiological examinations can be of help to localize and to do further analysis. Biopsy is necessary for the confirmation of the diagnosis [3].

In Sub-Saharan Africa, tumors of the central nervous system have not yet received enough attention. In fact, for long they were considered isolated cases in Africa and this was because of lack of investigation means; but today more and more cases are being diagnosed thanks to the expansion of computer tomography and medical imagery through magnetic resonance. In order to attempt a solution, a retrospective and descriptive study was carried out at the Pasteur Centre institute of Yaoundé- Cameroon.

METHODOLOGY

It was a retrospective and descriptive study spread over a period of 5 years from January 2010 to December 2014.First of all, patient's files whose diagnosis was established and confirmed as tumors of the central nervous system were registered. Secondly, heamatin eosin colored strips and paraffin blocks were kept. Anonymous strips were interpreted not withstanding the first result. The results were similar as well as the conclusion. Finally, information's on the socio demography and the morphology of each patient was Subjected to statistical analysis in order to determine the average age, the frequency of occurrence of the tumors as well as the correlation between the tumors and the age of the patients at a disclosed significant threshold of 0,05.

RESULTS

79 cases were registered. The Ages ranged from 4 to 79 years old with an average age of 37.7+/-18.8 years; among which 45 were females and 34 were males implying a sex ratio of 0.75%. The pediatric population represented 17.72% and that of adults 82, 2%.

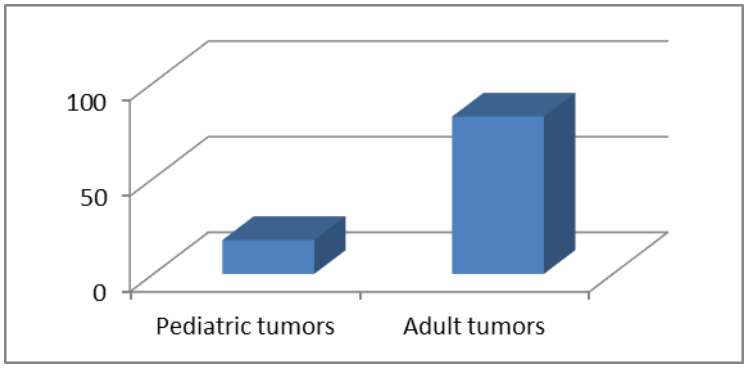

Figure No. 1: Frequency distribution of tumors with respect to the population

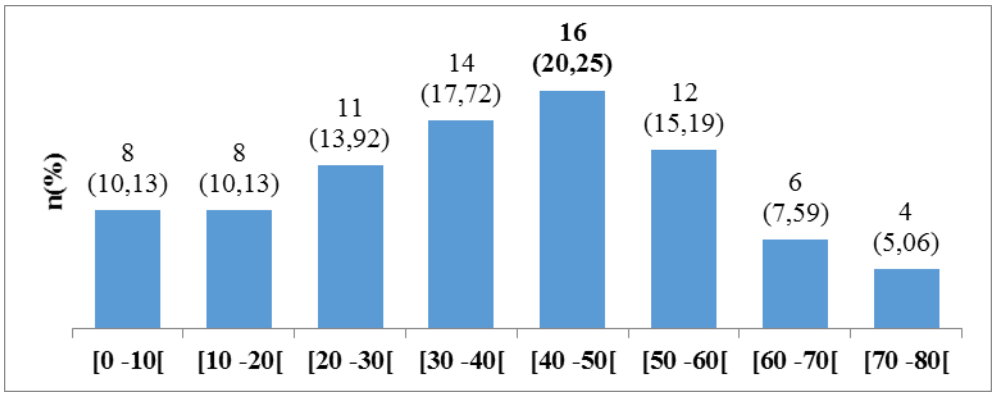

Figure No. 2: Frequency distribution of tumors of the central nervous system according to age.

89.87% of the tumors cases were localized intra skull tumors and 10.13% cases were intrathecal tumors.

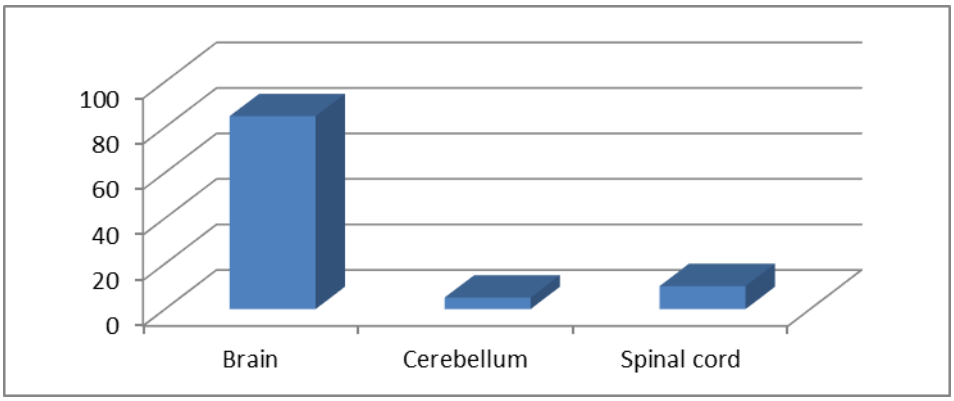

Figure No. 3: Diagram showing variations of central nervous system tumors frequency according to age

Furthermore, 55.56% of the tumors were meningioma and they were the most frequent among female patients; whereas, as for the male patients, glial tumors were the most frequent with 41.18% rate.

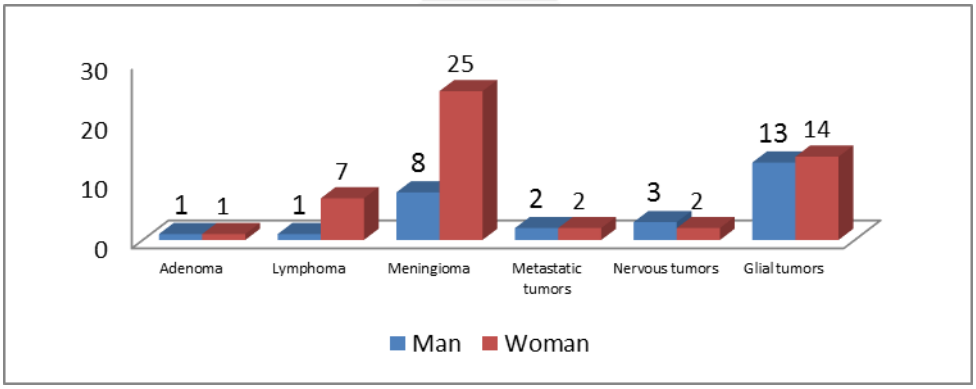

Figure No. 4: Diagram showing the different types of tumors according to gender

About 93.7% of the cases were primary tumors while 6.3% of the cases were secondary tumors.Glial tumors represented 34.18% and grade I astrocytoma were the most frequent but among those tumors glioblastoma represented 37% of glial tumors.

Table No. 1: showing the differentiation of glial tumors

Glial tumor	Frequency	Percentage
Grade I Astrocytoma	11	42.30%
Grade II Astrocytoma	2	7.6%
Grade III Astrocytoma	1	3.8%
Anaplastic astrocytoma	1	3.8%
Anaplasytic epandymoma	1	3.8%
Glioblastoma	10	38.46%
Total	25	100%

DISCUSSION

The objective of this work was to pinpoint the epidemiological and pathoanatomical aspects of tumors of the central nervous system at the Pasteur Centre in the city of Yaoundé- Cameroon.

Within this period, 79 cases were dealt with. These figures are inferior to those of Eyenga *et al.* who had obtained 231 cases in 3 neurosurgery units [4]. El MAHDI in Morroco had done a retrospective study over a period of 10 years and had obtained 906 cases.[5] Our small sample size was due to the fact that; the work was done specifically at the Yaoundé Pasteur Centre over a short period of time and because many patients are used do practice paralleled medicines. European studies reveal that tumors of the central nervous system are considerably increasing among the population and this is according to the Scandinavian register [6].

That increase could be explained not only by the improvement on access to medical imagery but also to alternation risk factors which are still controversial for some people as for instance the use of cell phone [7].

In fact, the highest incidence rate of tumors of the central nervous system is observed among the North American and Australian white population. The lowest rates are in Asia. These differences are closely related to a certain genetical sensitivity [8].

In Our series, the average age was 37.37+/- 18.87 with the extremes of 4 to 79 years old, and the most representative age group ranged between 40 and 50 years old. These data were similar to Eyenga's. Other studies carried out in Africa revealed an average age between 36 and 42 [9]. This fact could be justified by a short life expectancy in our regions unlike in developed country where tumors are predominant among people of 60 to 70 years old [10].

The pediatric population represented 17.72% while adults were 82.28%. The adult population was five times more affected than the young one. These results are similar to those of Andalousi and Saad [11].

The gender ratio was 0.75. These results were similar to Eyenga's who had found a gender ratio of 0.82. Our results differ from those of El Mahdi's from Morroco who had found a slight male predominance with 55 .15% of cases. The topographic distribution of all the tumors in this series revealed a clear predominance of intra skull tumors with 89.87% compared to 10.13% cases in intrathecal.

Our results match with those of Andrew from Ghana [12] who had found 87% of intra skull localizations and 13% intrathecal. In 96.67% of cases, our tumors were primitive and 6.33% were metastatic, unlike Eyenga who found 72.5% of primitive tumors and 27.5% of secondary tumors. Her sample was more important and certainly more representative of reality. In fact many patients suffering from cancer consult when the tumor is already metastatic.

The study of different histological types has proven that meningioma was the most represented with 41.77% cases.Glial tumors represented 34.18% of cases. These results are closed to Eyenga's who equally found that meningiomas were the most frequent of the series with 24%. Our results differ from those of El Mahdi in Morroco where astrocytoma represented 23.31%.

They equally differ from those of Zouaoui *et al* [13] in a study that showed 42.4% of glial tumors. A Sweden study confirmed an increased risk to develop glioma as from thirty minutes communication a day (as a result of electromagnetic waves). In our context, the results seem to be linked to a less important telephonic network coverage in Cameroon and a less length of communication time. Other studies, for instance, those of Quinn *et al.* in Africa and in USA showed a higher meningioma occurrence among black people than among white [14].

Meningioma tumors were more frequent among female patients(55.56%). These results are quite similar to those of Chirimwani [15] who obtained a 58.4% female predominance of meningioma. The predominance of meningiomas among women is classical. The endocrine relation of meningiomas lies on certain number of elements: There is a frequent association with breast cancer; besides, a pregnancy will lead to a quick evolution and mostly intensifies hormonal receivers. Though the majority of meningiomas highly express receivers to progesterone, only a small number of them react to anti –progestational treatment. The role of oestrogen-progesterone contraception remains controversial. Nevertheless, it could be associated to an increased risk of meningioma development.

In our series, glial tumors among male patients were the most frequent (41.18%). These results are similar to those of Quinn *et al.* who equally found a predominance of glial tumors among male patients with a 48.84% rate.

As far as glial tumor differentiation was concerned, the challenge, whose objective is to define the histological type of glioma still remains. Astrocytic, oligodendroglioma or mixed and its grade in order to suggest an appropriate therapy. Yet, the international classification standard remains that of world health organization (WHO) which suffers from lack of reproducibility.

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Contributions: All authors' contributed in the conception, realization and writing of the manuscript. Procedures.

Conflict of Interest: Authors declared no conflict of interest.

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