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ORIGINAL ARTICLE

EPIDEMIOLOGICAL AND SURGICAL PROFILE OF NEURO-ONCOLOGY PATIENTS SUBJECTED TO NEUROLOGICAL SURGERIES

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ABSTRACT

Objective: to investigate the sociodemographic and surgical profile of neuro-oncology patients subjected to neurological surgeries.

Method: a descriptive and retrospective study with a quantitative approach, conducted during a five-year period (2014-2018) in a hospital with 236 beds, which is a reference in cancer treatment in the state of Pará. The data were collected from September to December 2019 and analyzed by means of descriptive statistics.

Results: the profile was characterized by the age group of 41 to 50 years old (30.8%; n=20) and by individuals with complete elementary school (44.6%; n=29). They were subjected to elective surgeries (87.7%; n=57), considered clean (95.4%; n=62), and large (96.9%; n=63). The main complications were surgical site infection (10.7%; n=8) and tumors located in the encephalus (60%; n=39).

Conclusion: the paper contributed to delineate the profile of the population served by the hospital, enabling the expansion of debates aimed at improving hospital planning and at refining the quality of the health services and of the Nursing assistance.

DESCRIPTORS: Nursing Care; Oncology Nursing: Neurological Surgery; Surgery; Epidemiological Profile.

PERFIL EPIDEMIOLÓGICO Y QUIRÚRGICO DE PACIENTES NEURO-ONCOLÓGICOS SOMETIDOS A CIRUGÍAS NEUROLÓGICAS

RESUMEN:

Objetivo: investigar el perfil sociodemográfico y quirúrgico de pacientes neuro-oncológicos sometidos a neurocirugías. Método: estudio descriptivo y retrospectivo con enfoque cuantitativo, realizado en un hospital con 236 camas de referencia en cáncer en el estado de Pará durante un período de cinco años (2014-2018). Los datos se recolectaron entre septiembre y diciembre de 2019 y fueron analizados por medio de estadística descriptiva. Resultados: el perfil incluyó personas pertenecientes al grupo etario de 41 a 50 años (30,8%; n=20) y con enseñanza primaria completa (44,6%; n=29). Fueron sometidos a cirugías electivas (87,7%; n=57), consideradas limpias (95,4%; n=62) y de gran magnitud (96,9%; n=63). Las principales complicaciones que se hicieron presente fueron infección de la herida quirúrgica (10,7%; n=8) y tumores localizados en el encéfalo (60%; n=39). Conclusión: el trabajo contribuyó para delinear el perfil del público atendido por el hospital, viabilizando la ampliación de debates que tenga como objetivo mejorar la planificación hospitalaria y perfeccionar la calidad de los servicios de salud y de la asistencia de Enfermería.

DESCRIPTORES: Atención de Enfermería; Enfermería Oncológica; Neurocirugía; Cirugía; Perfil Epidemiológico.

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INTRODUCTION

Cancer (CA) is a generic term to represent more than a hundred diseases characterized by disorderly cell growth. According to the World Health Organization (WHO), 27 million new cancer cases are expected by 2030. Despite increasing investments in the implementation of public health policies and programs aimed at prevention and early diagnosis, cancer still emerges as one of the main causes of death worldwide[1].

The research indicates that there is an increase in the incidence of brain tumors in industrialized countries; however, it does not evidence any clear ethnic, gender or geographical differences. When brain tumors derive from cells inside the brain, they are considered primary, and systemic when they metastasize to the brain, occurring at some time in 10% to 15% of the individuals with cancer. The most common metastases in adults develop in cases of carcinomas, including lung, breast, kidney, and colorectal cancer, and melanoma[2].

Neurological tumors are among those most difficult to treat. Despite the surgery, many patients have incurable cancer and/or disabling symptoms, with a mean survival of less than two years for patients with glioblastoma[3]. In this perspective, nurses are responsible to critically assess the patients' condition, as well as the possible real or potential risk factors to which patients are exposed, as well as the therapeutic effect and prognosis. These actions enable the systematization of Nursing care to the patient, in addition to allowing for the creation of instruments to assess indicators to assess assistance and to measure the workload[4].

The surgical center is one of the sectors where nurses can have this perception on patients, because it is where most health adverse events occur. The cause can be multi-factorial, due to the complexity of the procedures, and the surgical interventions are considerably associated to the risks of complications and death. Therefore, the search for patient safety in the pre-operative and trans-operative periods has been a question widely discussed in terms of the performance of nurses in the surgical center[5-6].

Currently required by the health organizations, patient safety is defined as reducing to an acceptable minimum the risk of unnecessary harms associated to health care[7]. In this sense, the objective of Nursing assistance is to care for the surgical patients and their families, that is, to develop actions in the pre-, trans-, and post-operative periods[6].

In view of the aforementioned, this study aimed at investigating the sociodemographic and surgical profile of patients with neurological tumors subjected to neurological surgeries.

METHOD

This is a descriptive and retrospective study with a quantitative approach, conducted during a five-year period (2014-2018) in a hospital which is a reference in cancer in the state of Pará, aiming at characterizing the sociodemographic and clinical aspects of the patients.

The following inclusion criteria were used for sample selection: medical records of patients of both genders aged over 18 years old; central nervous system cancer diagnosis; indication of surgical treatment; and those who were hospitalized in the neurological surgery clinic. The medical records of patients subjected to neurological surgeries for a second time were excluded, as well as those of individuals with neurological metastasis, or who were subjected to surgery in another institution.

The variables studied included the sociodemographic and clinical ones: gender, age, date of birth, schooling, marital status, occupation, address, base disease, and personal morbid history; and the surgical variables: time of the surgery, preparation, use of prophylactic antibiotic, and contamination potential of the surgery.

Data collection was carried out between September and December 2019. A total of 65 medical records of patients with neurological tumors subjected to neurological surgeries were selected.

The analysis was conducted using descriptive statistics; the categorical variables were presented by means of absolute and percentage frequencies of the socioeconomic, epidemiological, and surgical data from cancer patients subjected to neurological surgeries. For the formatting of tables, graphs and text, Microsoft Excel® 2010 and Microsoft Word® 2010 were used, respectively.

Data was collected by means of primary information, in the patients' medical records filed in the Medical and Statistical Archive Division (*Divisão de Arquivo Médico e Estatístico*, DAME). Data collection was conducted by using a structured instrument, and each participant was identified in an alphanumeric manner: P1, P2, P3..., with P meaning "Participant".

According to the ethical and legal precepts, the research was approved by the Research Ethics Committee of the Ophir Loyola Hospital under opinion No. 3,557,096.

RESULTS

The data were organized in Table 1 so as to better show the characteristics of the patients with neurological tumors who were subjected to surgery. Predominance of the male gender was observed (50.8%; n=33); in the age group of 41 to 50 years old (30.8%; n=20), and with complete elementary school (44.6%; n=29). With regard to their professions, in relation to the female gender 18.5% (n=12) were housewives, whereas most men were farmers. Regarding race, 93.8% (n=61) of the participants self-declared as brown-skinned. In relation to marital status, 38.5% (n=25) are single, 29.2% (n=19) are married, and 23.1% (n=15) are in a stable union.

Table 1 – Sociodemographic profile of the neuro-oncology patients subjected to neurological surgeries from January 2014 to December 2018. Belém, PA, Brazil, 2020 (continues)

VARIABLES	(n)	(%)
Gender		
Female	32	49.2
Male	33	50.8
Age group		
18 to 20	2	3.1
21 to 30	9	13.8
31 to 40	8	12.3
41 to 50	20	30.8

51 to 60	15	23.1
> 60	11	16.9
Schooling		
Illiterate	5	7.7
Elementary School (complete)	29	44.6
High School (complete)	15	23.1
Higher Education (complete)	5	7.7
No information	11	16.9
TOTAL	65	100

Source: The authors (2020)

With regard to the risk factors identified in the medical records analyzed, 64.6% (n=42) of the patients denied any health-associated comorbidities, whereas 20% (n=13) reported systemic arterial hypertension, as shown in Table 2.

Table 2 – Risk factors of the neuro-oncology patients subjected to neurological surgeries from January 2014 to December 2018. Belém, PA, Brazil, 2020

RISK FACTORS	**(n)**	**(%)**
Personal morbid history		
Systemic Arterial Hypertension	13	20
Diabetes Mellitus	2	3,1
Systemic Arterial Hypertension and Diabetes Mellitus	5	7,7
Denies comorbidities	42	64,6
No information	3	4,6
TOTAL	65	100

Source: The authors (2020)

Table 3 shows that 87.7% (n=57) of the surgeries performed were elective, that 96.9% (n=63) of them were large, and that 80% (n=52) were performed with the patient in the surgical supine position. It is important to highlight that 95.4% (n=62) of the surgeries were considered clean.

Table 3 – Surgical profile of the neuro-oncology patients subjected to neurological surgeries from January 2014 to December 2018. Belém, PA, Brazil, 2020

Type of Surgery	(n)	(%)
Elective	57	87,7
Emergency	1	1,5
Urgency	7	10,8
Size		
Large	63	96,9
Medium	2	3,1
Position		
Lateral	1	1,5
Supine	52	80
Ventral	7	10,8
Prone	1	1,5
No information	4	6,2
Contamination Potential		
Contaminated	2	3,1
Infected	1	1,5
Clean	62	95,4
TOTAL	65	100

Source: The authors (2020)

The main post-operative complication of the neurological surgeries was surgical wound infection, with eight (10.7%) instances. However, 81.5% (n=53) of the reviewed medical records did not identify the possible complications that may have occurred during the post-operative period (Table 4).

Table 4 – Main post-operative complications in the neuro-oncology patients subjected to neurological surgeries. Belém, PA, Brazil, 2020

Complications	(n)	(%)
Surgical wound infection	8	10,7
Surgical wound dehiscence	1	1,5
Fluid fistula	1	1,5
Worsening of the initial symptoms	1	1,5
Syndrome of inappropriate secretion of antidiuretic hormone	1	1,5
No information	53	81,5
TOTAL	65	100

Source: The authors (2020)

With regard to the tumor location in the patients, 60% (n=39) were encephalic, nine (13.8%) were located in the head, and brain and hypophysis accounted for approximately 9% and 3%, respectively, as presented in Table 5.

Table 5 – Tumor location in the neuro-oncology patients subjected to neurological surgeries. Belém, PA, Brazil, 2020

Tumor location	(n)	(%)
Encephalus	39	60
Head	9	13,8
Brain	6	9,2
Hypophysis	2	3,1
Skull calotte	1	1,5
Cervical spine	1	1,5
Lumbar spine	1	1,5
Skull and face	1	1,5
Lumbosacral lymphoma	1	1,5
Spinal cord	1	1,5
Spinal cord at C2	1	1,5
Subarachnoid	1	1,5
TOTAL	65	100

Source: The authors (2020)

DISCUSSION

Encephalic tumors make up a rare and heterogeneous group of tumors that account for approximately 3% of the cancer cases worldwide. Their prognosis varies according to age and histological type, but their survival rates are low; in higher income countries, which can provide patients with better medical care and new therapies, the survival rates are higher[8].

With regard to the socioeconomic aspects, there was predominance of the male gender, corroborating a research study conducted by the Brain Tumor Center of the United States on the epidemiology and diagnosis of brain tumor, asserting that the incidence of brain tumors was 1.3 times higher in men than in women, while meningiomas were twice more common in women[2]. Another study conducted in Croatia with 6,634 cases of encephalic tumors reported that this disease is more frequent in men, with an incidence of 52%, as well that there was an increase in the number of deaths due to these tumors[9]. The findings of this research are also in consonance with the most recent global incidence estimates of GLOBOCAN 2018, presenting higher general incidence in men (55% versus 45%)[10].

Regarding, the predominant mean among the patients was 51 years old, in line with

another study developed in the Medical and Statistical File Service of the Irmandade da Santa Casa de Misericórdia Central Hospital of São Paulo, which analyzed 109 medical records of patients subjected to neurological surgery and observed that the most representative age group was from 40 to 61 years old (64.3%)[11]. Reasserting these findings, a study of magnetic resonance imaging-based screening for asymptomatic brain tumors showed that primary malignant tumors are frequently diagnosed in individuals with a mean age of 64 years old[12]. Furthermore, a research study on the incidence and mortality of brain neoplasms in Croatia from 2001 to 2014 showed a higher mortality rate among men aged from 75 to 79 years old[9].

In a study analyzing the epidemiological characteristics of these patients, it was determined that 29 (44.6%) had completed elementary school, followed by 15 (23.1%) with complete high school, which indicates low schooling level and, possibly, greater difficulties in accessing the health services, which implies late diagnosis and difficulties in obtaining specialized treatment in a timely manner[11].

The patients subjected to neurological surgery have a high risk for neurological and systemic complications, which can further aggravate in the presence of some comorbidity. Among the most frequent neurological complications are nausea and vomiting, decreased level of consciousness, hypotension, cerebral vasospasm, respiratory distress, seizures, and surgical site infection[13].

However, a study on Epidemiology and diagnosis of brain tumors conducted in the United States asserts that the origin of encephalic tumors is unknown, and few surveys reveal its specific genesis, given the relativity or rarity of their incidence and the patients' rapid death due to their aggressiveness. In addition to this, it mentions that diet, use of vitamins, alcohol consumption, smoking, and environmental factors reveal little about the onset of these tumors. However, it asserts that, although smoking has a carcinogenic effect, no study provided scientific grounds for its role in the development of encephalic tumors and, interestingly, alcohol can reduce the risk for the development of primary encephalic tumors[2].

With regard to the surgery, elective procedures predominated over urgent ones. In this perspective, a review study conducted by Brazilian researchers argues that, prior to surgery, it is necessary to understand the patient's and family's fears and expectations, since a close relationship between the multi-professional team and the patient-family enables better results[14]. Therefore, surgical treatment is the pillar for recovery, aiming at maximum tumor resection with function preservation[15]. Elective surgery also favors a good pre-operative preparation and thus contributes to reducing the risk of post-operative complications, including infections, which increase the risk of surgical wound infection and possible re-surgery[2].

With regard to the size of the surgery, most of the procedures were characterized as large, which exerts a directly influence on the length of the surgery. Patients subjected to surgical procedures lasting longer than five hours are more prone to presenting hypertension, increasing the risk of intra- or post-operative complications – the shorter the time, the lower the possibility of post-operative complications. In addition, pre-operative factors can increase the risk of cardiac and respiratory events, prolonging the post-anesthesia recovery (PAR) period[4].

When considering the main complications related to the post-operative period, surgical wound infection was the most prevalent, being the cause for the patient's readmission and prolonged stay in the clinic. A research study conducted with 222 patients subjected to neurological surgery indicated the following as main complications: cognitive disorders, fistulas, seizures, motor disorders, cranial nerve disorders, with higher incidence on III-VII-VIII, and metabolic disorders[16]. There is a close relationship between complications and tumor location, since primary encephalic tumors rarely invade others regions outside the central nervous system; hence, they tend to spread not only through the brain but also to the entire spinal cord[2].

Therefore, an accurate location of the encephalic structures in relation to the neoplastic structure can be achieved by pre-operative imaging scans to determine the tumoral region, since errors in determining the location can lead to unnecessary brain injuries and incomplete tumor identification or resection. Finally, it is worth noting that the technological advance in brain surgery over the two last decades improved the recognition of tissue infiltrated by the tumor and of eloquent areas, in order to reduce the risks of neurological deficits[17].

Within this scenario, nurses play a fundamental role in patient safety during the entire peri-operative period by assessing prevention measures and being engaged in patient identification, checking of medical records, communication and team qualification, accommodation, and transportation, in addition to checking and maintaining diverse equipment so as to prevent adverse events in the patients.

Given this, nurses need to be prepared to provide comprehensive patient care, acknowledging the specificities of the pathology in question, identifying such needs concerning both direct care to the patients and also to their families care, providing information on the patients' current condition[18].

The limitation of the present study is the fact that is was conducted in a single reference hospital in Oncology, which precludes the generalization to other realities.

CONCLUSION

The present study showed that most of the tumors were located in the encephalus, were more frequent in men aged from 41 to 50 years old, with complete elementary school, and no reported comorbidities. They were subjected to elective and clean surgeries, with surgical site infection as the main post-operative complication. These epidemiological and surgical findings can constitute a parameter to improve the services, aiming at a better approach to these patients in the hospitals.

Incorporated to to the competences of surgical nurses, this knowledge can subsidize their practice for the planning of better quality assistance in all the peri-operative stages, even in post-operative recovery and rehabilitation, as well as in the prediction and provision of material and human resources in the units that provide care to these patients.

It was evidenced that nurses play an important role in care planning; therefore, they should enable care continuity by means of a daily and systematized assessment, performing precise interventions during the care of the neurosurgical patient, so as to contribute for humanized assistance, preventing possible problems and sequelae.

It is emphasized that the paper contributed to delineate the profile of the population served by the hospital, enabling the expansion of debates aimed at improving hospital planning and at refining the quality of the health services and of Nursing assistance.

REFERENCES

1. Ministério da saúde (BR). Instituto Nacional de Câncer José Gomes Alencar da Silva. Coordenação de Prevenção e Vigilância. Estimativa 2018: incidência de câncer no Brasil. [Internet]. Rio de Janeiro: INCA; 2018 [accessed 04 nov 2019]. Available from: https://www.inca.gov.br/numeros-de-cancer.

2. Butowski NA. Epidemiology and diagnosis of brain tumors. Continuum (Minneap Minn). [Internet]. 2015 [accessed 23 jun 2020]; 21(2). Available from: http://doi.org/10.1212/01.CON.0000464171.50638.fa.

3. Mellinghoff IK, Gilbertson RJ. Brain tumors: challenges and opportunities to cure. J Clin Oncol. [Internet]. 2017 [accessed 23 jun 2020]; 35(21). Available from: https://ascopubs.org/doi/10.1200/JCO.2017.74.2965.

4. Barboza DS, Silva RGM da. Systems of classification of patients in a neurological intensive care unit. J Health NPEPS. [Internet]. 2016 [accessed 05 nov 2019]; 1(2). Available from: https://periodicos.unemat.br/index.php/jhnpeps/article/view/1552.

5. Henriques AHB, Costa SS da, Lacerda J de S. Assistência de enfermagem na segurança do paciente cirúrgico: revisão integrativa. Cogitare enferm. [Internet]. 2016 [accessed 05 nov 2019]; 21(4). Available from: https://revistas.ufpr.br/cogitare/article/view/45622/pdf.

6. Rodrigues GF, Castro TCS, Vitorio AMF. Segurança do paciente: conhecimento e atitudes de enfermeiros em formação. Rev Recien. [Internet]. 2018 [accessed 25 mar 2019]; 8(24). Available from: https://www.recien.com.br/index.php/Recien/article/view/266/pdf.

7. Trevilato DD, Melo TC de, Fagundes MABG, Caregnato RCA. Posicionamento cirúrgico: prevalência de risco de lesões em pacientes cirúrgicos. Rev SOBECC. [Internet]. 2018 [accessed 18 jan 2020]; 23(3). Available from: https://revista.sobecc.org.br/sobecc/article/view/398/pdf_1.

8. Miranda-Filho A, Piñeros M, Soerjomataram I, Deltour I, Bray F. Cancers of the brain and CNS: global patterns and trends in incidence. Neuro Oncol. [Internet]. 2017 [accessed 23 jun 2020]; 19(2). Available from: http://doi.org/10.1093/neuonc/now166.

9. Mrak G, Korent V, Krpan AM, Bitunjac A, Kordic A, Stenger M, et al. Malignant brain neoplasms incidence and mortality trends in Croatia from 2001 to 2014. Croat Med J. [Internet]. 2019 [accessed 23 jun 2020]; 60(1). Available from: http://doi.org/10.3325/cmj.2019.60.33.

10. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. [Internet]. 2018 [accessed 23 jun 2020]; 68(6). Available from: http://doi.org/10.3322/caac.21492.

11. Santos LB dos, Waters C. Perfil dos pacientes submetidos à neurocirurgia para tratamento de aneurismas intracranianos. Rev Arq Med Hosp Fac Cienc Med Santa Casa. [Internet]. 2018 [accessed 18 jan 2020]; 63(1). Available from: http://arquivosmedicos.fcmsantacasasp.edu.br/index.php/AMSCSP/article/view/56/44.

12. Neugut AI, Sackstein P, Hillyer GC, Jacobson JS, Bruce J, Lassman AB, et al. Magnetic resonance imaging-based screening for asymptomatic brain tumors: a review. oncologist. [Internet]. 2018 [accessed 23 jun 2020]; 24(3). Available from: http://doi.org/10.1634/theoncologist.2018-0177.

13. Siqueira EMP, Diccini S. Postoperative complications in elective and non-elective neurosurgery. Acta Paul. Enferm. [Internet]. 2017 [accessed 06 ago 2020]; 30(1). Available from: https://doi.org/10.1590/1982-0194201700015.

14. Rotta JM, Oliveira MF de. Fundamentals of brain tumor surgery in eloquent areas. Arq Bras Neurocir. [Internet]. 2015 [accessed 23 jun 2020]; 34(2). Available from: http://dx.doi.org/10.1055/s-0035-1554740.

15. Antonio ACT, Nakaya L, Petrilli S, Tsai L. Motor changes in children and adolescents after intramedullary tumor surgery: a retrospective study. Rev bras neurol. [Internet]. 2018 [accessed 23 jun 2020]; 54(1). Available from: https://revistas.ufrj.br/index.php/rbn/article/view/16936.

16. Mora JCS, Espinoza WC, Goyes JC, Criollo LT, Paute JC, Mora H, Rugel L. Sequelar pathology associated intracranial surgical treatment of tumors in the regional hospital surgery Teodoro Maldonado Carbo 2014. INSPILIP. [Internet]. 2017 [accessed 23 jun 2020]; 1(1). Available from: https://pesquisa.bvsalud.org/portal/resource/pt/biblio-987862?src=similardocs.

17. Hu LS, Brat DJ, Bloch O, Ramkissoon S, Lesser GJ. The practical application of emerging technologies

influencing the diagnosis and care of patients with primary brain tumors. Am Soc Clin Oncol Educ Book. [Internet]. 2020 [accessed 23 jun 2020]; 40. Available from: https://ascopubs.org/doi/10.1200/EDBK_280955.

18. Souza ATG, Silva TK de P da, Domingues AN, Tognoli SH, Eduardo AHA, Macedo JI, et al. Patient safety in the surgical center: nursing professionals perceptions. REV. SOBECC. [Internet]. 2020 [accessed 18 set 2020]; 25(2). Available from: http://doi.org/10.5327/Z1414-4425202000020003.

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