A prospective Study to assess Periorbital Edema among Patients after Craniotomy at selected hospitals, Coimbatore

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Abstract **- Patients can have surgery related complications such as hematomas, peri-orbital edema as a consequence of surgical injury during the immediate postoperative phase of craniotomy. Objectives: To assess the peri-orbital edema among patients of supra-tentorial craniotomy. To find out the association between the grade of periorbital edema and selected variables. Methodology: A prospective study was conducted to assess the peri-orbital edema among patients of craniotomy, 30 patients were included. Ethical clearance was obtained from Institute Ethics Committee. Consecutive sampling technique was used. The patient information sheet was given to adult patient with peri-orbital edema after craniotomy. Peri-orbital edema was assessed by using. Surgeon Periorbital Rating Edema and Ecchymosis Scale (SPREE Results: The prevalence, as well as severity of peri-orbital edema after craniotomy was increased and were presented using descriptive statistics. 25 patients (83.3%) were having the grade 4 periorbital edema indicate the full closure of the eye. and the remaining 5patients were having the grade 3(16.66%) periorbital edema indicate the full coverage of iris with swollen eyelids. Conclusion: It is very important to assess peri-orbital edema so that appropriate intervention can be taken to promote comforts of the patients of craniotomy.**

Index Terms **- craniotomy, peri-orbital edema, Surgeon Periorbital Rating Edema and Ecchymosis Scale.**

1.INTRODUCTION

The human brain is a three-pound organ that controls the body. It receives signals from the body's sensory organ and outputs information to the muscles. (Hines 2018) A Road traffic accident (RTA) is an unpredictable event that occurs on a way or street, open to public traffic, resulting in recognizable damage or injury. (Heaven 2016)

A road traffic accident is the leading cause of mortality and morbidity in developing countries. Approximately 1.35 million people die each year as a result of a road traffic crash. Between 20 and 30 million more people suffer non- fatal injuries. Most of the victims survive with significant disabilities, culminating in a major socio-economic burden and also harms the quality of life. (WHO 2020)

A craniotomy is a cornerstone for the management of the traumatic brain injury worldwide and it is estimated that more than 60000 craniotomy surgeries are performed per year in Tamil Nadu. Craniotomy refers to the surgical removal of a section of the skull to access the intracranial compartments. The portion of the skull temporarily removed is called bone flap and it is placed back in its original position after the operation is completed, typically fastened into place with low profile titanium plates and screws.

Expected postoperative complications related to craniotomy are hematoma formation, cerebral edema, subgaleal collection, per orbital edema, wound/bone flap infection, extra dural abscesses, and herniation. (Diccini 2015) The incidence of subgaleal collection varies from 7 to 33% and per orbital edema varies from 2.8 to 100% (Diccini, 2015). Periorbital edema refers to swelling in the area around the eye socket or eye orbit caused due to accumulation of liquid between the galealaponeurosis and pericardium (subgaleal collection) so a patient may have pain, ecchymosis with or without hematoma formation and improper vision However, periorbital edema prevents pupil examination. The nurse performs a neurological examination to detect alteration that may put a patient's lives at risk in the craniotomy post-operative period. (Diccini 2015)

There are various pharmacological and non-pharmacological methods for reducing periorbital edema. The drugs related complications will affect patients' consciousness and cognition. It needs a low cost and safe method for reducing patients' periorbital edema and preserving their hemodynamic stable.

2. NEED FOR THE STUDY

TBI followed by falls (20-25%) of TBI is at the time of injury craniotomy surgeries take epidemic proportions by 2018. It estimates that 1million death rate in India. Craniotomy surgeries are the biggest problem in Tamilnadu and they estimate that above 60000 thousand surgeries are done per year. Craniotomy plays a vital role in emergency services; the team uses a multidisciplinary approach to provide a complete range of services for the diagnosis, treatment, and rehabilitation of patients with craniotomy. Traumatic brain injuries (TBI) are the leading causes of morbidity, mortality, disability, and socio-economic losses in India and other developing countries.

Globally head injury is estimated at 200 per 1, 00,000 people per year in 2008. 2.4% had increased in the year of 2011 (Mitchells 1990). In India 1.6 million sustain head injury, 10% die and in these, males are 5 times more prone to TBI than females. Tamil Nadu has reported the maximum number of road accidents (67,757) accounting for 15.4% of such accidents in the country. (Ruikar, 2013) The most feared complication after craniotomy is intracranial hematoma formation on the surgical site, and cerebral edema, surgical trauma, and periorbital edema. Periorbital edema is usually treated by nursing management.

3. STATEMENT OF THE PROBLEM

A prospective Study to assess Periorbital Edema among Patients after Craniotomy at selected hospitals, Coimbatore.

4. OBJECTIVES

- To assess the degree of periorbital edema after craniotomy.
- To find out the association between the grade of periorbital edema and selected variables.

5. OPERATIONAL DEFINITION

5.1 Periorbital edema

Periorbital edema refers to swelling in the area around the eye socket or eye orbit due to accumulation of liquid after the Craniotomy surgery which will be assessed by using SPRE

5.2 Craniotomy

Craniotomy refers to the surgical removal of a section of the skull to access the intracranial compartments.

6. MATERIALS AND METHODS

The study was conducted at Sri Ramakrishna Hospital, Coimbatore and the bed strength of the hospital is 750. Sri Ramakrishna Hospital has been founded to make a distinct mark in the health care and in addition with the treatment of craniotomy surgery with the most advanced equipment. It has an ICU, HDU, post operative ward, and Neuro ward where approximately 25-30 craniotomy procedures are conducted per month in the present setting. Purposive sampling technique was used to select the participants for this study. A total of 30 patients after craniotomy surgery at Sri Ramakrishna hospital were selected as the study participants for the study based on inclusion and exclusion criteria. The samples were selected based on the following inclusion and exclusion Criteria.

6.1 Inclusion Criteria

1 Patients who underwent craniotomy in the age group of 18 years and above.

2 Patients who are having stable vital signs.

3 Patients who have periorbital edema after craniotomy

6.2Exclusion Criteria

1 Cerebrospinal fluid leakage in the postoperative period.

2 Patients with subgaleal drainage.

3 Patients with eye socket tumor.

6.3 Tools used for data collection

Section A - Questionnaire on Demographic data.

Section B - Questionnaire on Medical history.

Section C - Surgeon Periorbital Rating of Edema scale

Questionnaire on demographic data consists of age, gender, religion, educational status, occupation, marital status, type of family. Questionnaire on medical history consists of the previous history of

health illness, history of neurological disorders, history of brain tumors and history of head injury.

Surgeon Periorbital Rating Edema and Ecchymosis Scale (SPREE) is a standardized tool to assess the Periorbital edema and Ecchymosis. In this study the researcher used only the edema scale. This is highly validated scale and being used worldwide to measure periorbital edema. The periorbital edema can be defined as periorbital swelling in the area around the eye socket or eye orbit due to Accumulation of liquid. The Surgeon Periorbital Rating Edema scale is the 4-grade rating scale and it consists of 4 items

Score	Grade of periorbital edema
1	No coverage of iris with eyeli
2	Slightly coverage of iris with eyelids
3	Full coverage of iris with eyelids
4	Full closure of iris with eyelids

SPRE scale is a tool for assessing the grade of periorbital edema of the patient after craniotomy surgery. The scale consists of four items. The total grade from 1-4. No coverage (1) indicate the no coverage of iris with swollen eyelids whereas slight coverage (2) indicate the slight coverage of iris with swollen eyelids, full coverage (3) indicate the full coverage of iris with swollen eyelids, full closure(4) indicate the full closure of the eye. The total scale is classified into four and interpreted as given below:

7. RESULTS AND DISCUSSION

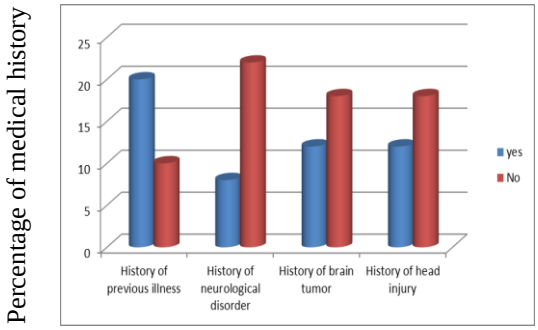
7.1 Demographic details of patients after craniotomy surgery

The demographic variables such as age, gender, religion, education status, occupation, marital status, type of family, were collected and analyzed using descriptive statistics in terms of frequency and percentage. Analyzed data were presented in the form of tables and diagrams. The age of patients after craniotomy surgery ranged from 21 – 70 with the mean age of 58 years respectively. The results showed that 9(30%) patients were belong to the age group of 21 - 40 and 9(30%) patients were belong to the age group of 51 – 60, 7(25%) patients belong to 41 – 50,5 (15%)patients belong to 61 -70.

7.2 Medical histories of patients after craniotomy surgery

S.no	Medical history	yes	%	No	%
1.	History of previous illness	20	66.66	10	33.33
2.	History of neurological disorder	8	26.66	22	73.33
3.	History of brain tumor	12	40	18	60
4.	History of head injury	12	40	18	60

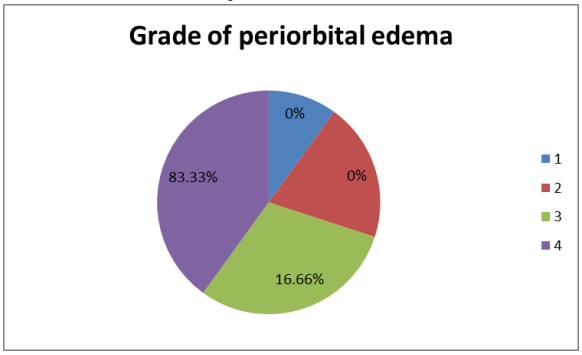
History of previous medical illness: 20(66.66%) patients had a history of previous medical illness whereas 10(33.33%)patients had no history previous medical illness. Out of 30 patients 24(80%) patients had a history of neurological disorders such as brain tumor, head injury, 6 (20%) patients had no history of neurological disorders



History of medical history

7.3 Assessment of periorbital edema.

The grade of periorbital edema among the patient after craniotomy surgery was assessed using the surgeon rating periorbital edema scale (SRPE) which was categorized as no coverage (1) of iris with eyelids, slightly coverage (2) of iris with swollen eyelids, full coverage (3) of iris with swollen eyelids, and full closure (4) of the eye. Collected data were organized, analyzed, and were presented using descriptive statistics.25 patients (83.3%) were having the grade 4 periorbital edema indicate the full closure of the eye. and the remaining 5patients were having the grade 3(16.66%) periorbital edema indicate the full coverage of iris with swollen eyelids.



7.4 Association between the periorbital edema and selected variables among patients who underwent craniotomy surgery.

The association between the grade of periorbital edema and selected demographic variables among patients after craniotomy surgery. Chi-square test was used to find the association between a grade of periorbital edema and selected demographic variables like age, gender, educational status, occupation, marital status, type of family, and history of previous surgery among

patients after craniotomy surgery. It is found that chi-square value for age ($\chi 2=0.21$), gender ($\chi 2=0.19$), health illness ($\chi 2=0.23$), Neurological disorders ($\chi 2=0.12$), brain tumour ($\chi 2=0.035$) and head injury ($\chi 2=0.035$) had no association at 0.05 level of significance with the grade of periorbital edema among patients after craniotomy surgery

7.5 Limitation

The sample size of the study was small which limits the generalization of the study findings.

7.6 Recommendations

The study can be replicated with larger samples which would facilitate

7.7 Generalizations.

All staff nurses have to be trained to assess the grade of periorbital edema among patients after craniotomy surgery.

A similar study can be conducted among another surgical postoperative period.

Structured teaching programs can be conducted to the staff nurses working in Neuro ICU, HDU, post-operative ward, Neurology department to practice it in their routine care.

8.CONCLUSION

Periorbital edema was found in postoperative patients like after craniotomy surgery. The presence of severe periorbital edema hampered pupil examination in unconscious patients hence, the researcher suggests that nurses should assess the grade of periorbital edema at the earliest after craniotomy as routine care to reduce periorbital edema and thus promote their comfort and wellbeing

REFERENCE

[1] Agrawall A, Munivenkatappa A, Rustagi N, Mohan PR and Subrahmanyan BV. (2017). Epidemiological characteristics affecting outcome in traumatic brain injury. 31 (1), 28-31. DOI:10.4103/0972-4958.198435. http://www.jmedsoc.org/text.asp.

[2] Anderson M (2017). A prospective outcome studies observing patients with severe traumatic brain injury over 10–15 years. A International journal of anaesthesiology intensive care, pain, and critical emergency medicine. 64 (9), 23-32. https://doi.org/10.1111/aas.12880.

[3] Anand K, Paparajamurthy, Kumar M and Kiran SH. (2017). A clinical analysis of outcome in management of head injury in patients with highway road accidents. International journal of research in Medical Science. 6 (40), 88-96.DOI: http://dx.doi.org/10.18203/2320-6012.ijrms2016 1764.

[4] Amir A, Hoda MF, Khalil S and Krimani S. (2013). Pattern of head injuries among victims of road traffic accidents in a tertiary care teaching hospital. Indian journal of community health. 25(2), 23-33. https://www.iapsmupuk.org/journal /index.ph.

[5] Carroll LJ, Cassidy D, Cancelliere C, Cote P, Hincapie CA, Kristman VL, Holm LW, Borg J, Boussard CN and Hartvigsen J.(2016). Systematic Review of the Prognosis after Mild Traumatic Brain Injury in Adults: Cognitive, Psychiatric, and Mortality Outcomes: Results of the International Collaboration on Mild Traumatic Brain Injury Prognosis.3 (1), 119-120. DOI: 10.1016/j.apmr.2013.08.300

[6] Diccini S, Torres AC and Siciliano TMLI. (2015). Interference and characteristics of periorbital edema in pupil examination after craniotomy. Journal of analytical scielo 28(1), 89-94, https://doi.org/10.1590/1982 0194201500003.

[7] Donnelly AE, Culligan K and Selfe J. (2012). Muscle, Skin and Core Temperature after −110°C Cold Air and 8°C Water Treatment. Journal of global research analysis. 11(7), 21-33, DOI: 10.1371/journal.pone.0048190.

[8] Hines D. (2016). Road Traffic Accidents an Unpremeditated Crisis among School Students. IOSR Journal of Nursing and Health Science.

4(5), 89 – 91, ISSN: 2320–1959. DOI: 10.9790/1959-0504058991.
www.iosrjournals.org

[9] Shin YS, Lim NY, Yun SC and Park KO. (2009). A randomized control trail study to assess the periorbital edema levels of patient undergoing the craniotomy surgeries. Journal of Clinical Nursing. 21(18),94-97.DOI:10.1111/j.1365-2702.2008.02652.