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THE RELATIONSHIP OF VOMIITING WITH INTRACRANIAL TRAUMA IN MILD CASES OF HEAD INJURY

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Abstract:

Objective: *"To determine the relationship between intracranial pathology and post-traumatic vomiting in patients with mild brain injury".*

Study design: *A descriptive cross-sectional study.*

Location and duration: *In the Emergency and Neurosurgery Outpatient Department of Services Hospital Lahore for one year duration from March 2017 to March 2018.*

Methodology: *The data were analyzed in relation to 206 consecutive patients who were admitted to the emergency and neurosurgery outpatient department of Services Hospital Lahore. The data were collected through non-probability suitability sampling. The features examined were brain findings with computed tomography and severity and presence vomiting post-traumatically.*

Results: *A total of 206 patients with mild head injury were included in our study. A total of 127 (61.7%) patients presented with vomiting after head trauma and 79 (38.3%) patients with no vomiting. 49 (23.8%) vomited once, and 78 (37.9%) showed vomiting multiple times. Vomiting was significantly more common in patients who have abnormal computed tomography. Abnormal computed tomography showed a rate of 66.7% and 51.5% of patients with normal computed tomography. Conversely, in patients with post-traumatic vomiting, 72.4% had abnormal computed tomography scans as compared to 58.2% had abnormal CT scans, and no vomiting was observed. The relationship between intracranial lesion and vomiting in CT was statistically significant; p = 0.035; OR = 1.886, 95% CI = 1.042-3.411.*

Conclusion: *Computed tomography has a significantly higher incidence of intracranial lesions in patients with post-traumatic vomiting. These results support the inclusion of the study in defective guidelines for the application of minor injuries to the head.*

Key words: *mild head injuries, vomiting, computerized tomography of the brain.*

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INTRODUCTION:

In the UK, the average emergency department receives approximately 5000 patients who have a head injury each year. In the first evaluation, mild injuries were classified in eight out of 10 with Glasgow coma scale score 13 or above. CT is the preferred tool for the detection of a hematoma. In the United Kingdom, this is usually used in patients with focal neurological signs, depressive consciousness or fractures of the skull. That's why the skull Radiography remains the primary screening tool in which hospitalization of patients should be done for an observation or advised a CT scan. All mild head trauma patients do not done with skull x-ray. Patient inclusion criteria is rely on guidelines given by the panel of neurosurgery department and mostly by the UK emergency services. Posttraumatic vomiting has been proved to be a feature of intracranial hematoma, but there is no obvious proof that this is an independent etiology and risk factor. Some studies are contemplating associating vomiting as a possible cause of intracranial injury and associating it with headache as an indicator of long-term acceptance and observation. Others have concluded that vomiting does not pose an additional risk to patients with normal consciousness. The aim of this study was to know whether the severity or presence of post-traumatic vomiting in patients with mild brain injury could predict the risk of intracranial injury.

MATERIALS AND METHODS:

This descriptive cross-sectional study was held in the Emergency and Neurosurgery Outpatient Department of Services Hospital Lahore for one year duration from March 2017 to March 2018.

The data were collected through non-probability suitability sampling. Patients of all ages and both sexes, patients with traumatic brain injury, patients with GCS between 13 and 15 years, and patients with and without vomiting were included. Parents and their assistants were excluded from patients who did not consent to participate in the study, who had moderate or severe head trauma and had polymorphism.

After obtaining permission from the ethics committee of the hospital, all patients who met the criteria were included in the study. Informed consent was obtained in writing from relatives. During the first 24 hours of traumatic brain injury, all patients with GCS between 13 and 15 years of age were referred to the radiology department for a CT scan and were informed by the radiologist. All patients applied for evaluation and treatment in closed spaces. Family members were asked about vomiting, the presence and frequency of prophylaxis. Data were entered and analyzed using SPSS18. Descriptive statistics were used to calculate the mean, the standard deviation for age, the number of vomiting, and the GCS score.

Categorical variables included presence and vomiting intensity, the intracranial lesion on CT and anatomical findings, age group and gender. To this data Chi-square statistics were applied. Statistically, $p < 0.05$ was accepted.

RESULTS:

A total of 206 patients with mild head trauma were included in our study. Computed tomography was performed in all patients without contrast and was abnormal in most patients. In 127 (61.7%) patients, vomiting after head trauma and 79 (38.3%) patients did not show vomiting. 49 (23.8%) vomited once, and 78 (37.9%) showed vomiting multiple times.

Table 1: *GCS Score and number of vomiting episodes cross tabulation*

	Severity of Vomiting			
Score	**None**	**Single**	**Multiple**	**Total**
GCS 13	16	18	26	60
GCS 14	8	0	6	14
GCS 15	55	31	46	132
Total	79	49	78	206

Although patients with lower GCS scores were prone to recurrent vomiting, this difference was not statistically significant; $p = 0.061$. (Figure 2, Table 1, 2)

Table 2: *Chi-Square Tests*

	Value	df	Asymp. Sig.(2 sided)
PearsonChi-quare	8.996(a)	4	.061
Likelihood Ratio	12.311	4	.015
N of Valid Cases	206		

A. 1 cells (11.1%) have expected count less than 5. The minimum expected count is 3.33.

Vomiting was significantly more common in patients who underwent abnormal computed tomography.

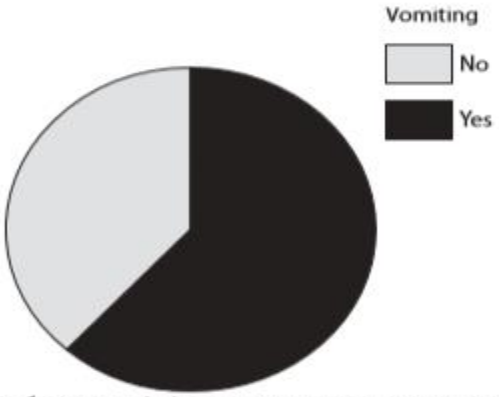

Figure 1: *Pie graph showing post traumatic vomiting among the study group with head injury*

The relationship between post-pneumatic vomiting and intracranial lesion detected on computed tomography was statistically significant; p = 0.035. (Table 3)

Table 3: *Association of post traumatic vomiting and CT scan findings (Vomiting / CT scan findings Crosstabulation)*

	CT scan findings		
	Abnormal CT	Normal CT	Total
Vomiting			
Yes	92	35	127
No	46	33	79
Total	138	68	206

Chi-Square Tests

	Value	df	Asymp.Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.449(b)	1	.035		
Continuity Correction(a)	3.830	1	.050		
Likelihood Ratio	4.402	1	.036		
Fisher's Exact Test				.047	.026
N of Valid Cases	206				

A. Computed only for a 2x2 table

Patients with abnormal computed tomography had a tendency to vomit repeatedly. Of 138 patients with abnormal computed tomography, 46 (33.3%) had vomiting, 38 (27.5%) had vomiting and 54 (39.1%) had recurrent vomiting. Of the 68 patients with normal computed tomography, 33 (48.5%) had vomiting, 11 (16.2%) had vomiting once, and

24 (35.3%) had recurrent vomiting. However, this difference did not reach statistical significance; p = 0.067. (Figure 3)

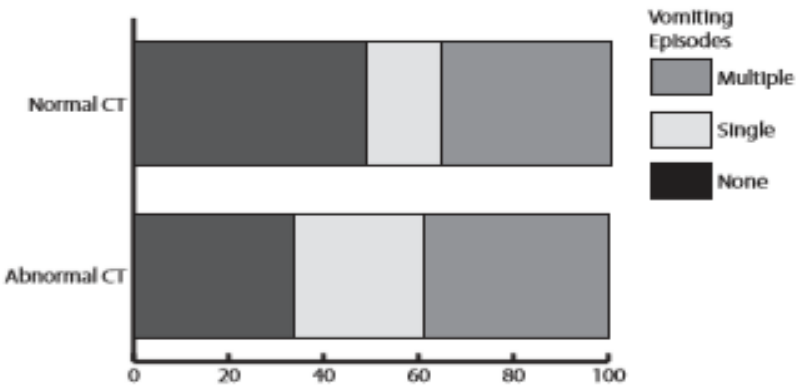

Figure 3: *Stacked Bar graph showing association of severity of vomiting and CT findings*

Patients with an abnormal CT scan had a risk of vomiting 1,886 times higher than those with a normal CT scan. (Table 3)

DISCUSSION

Cranial trauma is a common cause of medical evaluation in the ED (ED). Most of the patients with head trauma seen in the emergency departments due to minor head trauma and recover a negative result. Due to the absence of clear determinants of intracranial hemorrhage there are large differences in the medical application pattern for the examination and treatment of these patients. Vomiting is a common complaint in patients after head trauma, and many studies have arguments about the etiology of this symptom, a possible intracranial injury can be characteristic of the sign and is still a marker of lack of evidence independent of intracranial injury.

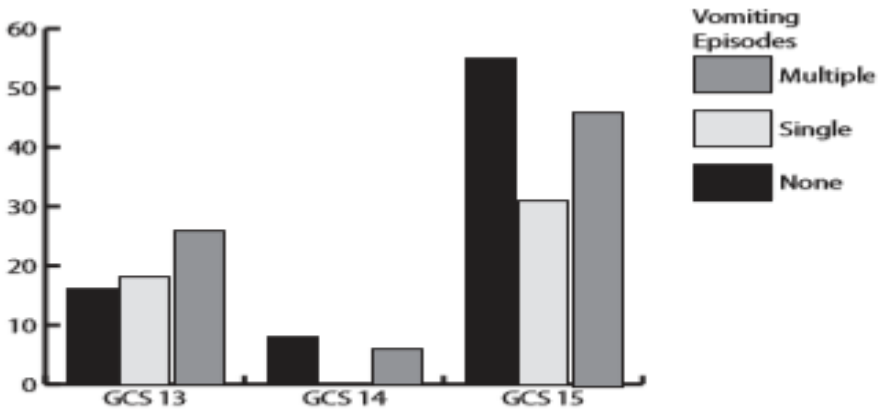

Figure 2: *Clustered bar graph showing severity of post traumatic vomiting and GCS score of the study group (n-206)*

We have done this research to evaluate vomiting as an indicator of intracranial injury after mild head trauma. Between moderate and severe head injuries, imaging requires a weaker level of awareness, but in cases of mild head injury we need other predictors that can help us decide the brain CT. In our study, vomiting was seen in 61.7% of the patients and 38.3% of the patients did not experience vomiting. Once vomiting was 23.8% and once 37.9%. Although patients with lower GCS scores were prone to recurrent vomiting, this difference was not statistically significant. Vomiting was significantly

more frequent in patients with abnormal computed tomography scans; 66.7% of patients with normal computed tomography and 51.5% of patients with normal computed tomography; p = 0.035; OR = 1295, 95%, Cl = 0.999-1.678. Our results complete previous observations that vomiting was a common symptom after cranial trauma in approximately 1 patient in 6 patients. This symptom was more common in children with intracranial lesions, but the opposite was not true; Most children (99%) had no anatomical abnormalities. However, a recent meta-analysis on the predictive effect of various clinical signs and symptoms concluded that vomiting was not an independent predictor of intracranial injury. Despite these findings, the history of post-traumatic vomiting is the basis for computed tomography screening, usually in patients admitted to the emergency department after head trauma. The exact mechanism of post-traumatic vomiting is not known, but it is suggested that the forces apply to the head as a result of trauma as a result of the trauma that can cause stress to the cutting and compression in the brainstem, causing the stimulation of the vomiting center is the region of activation of the adjacent chemo receptor of the reticular formation and postrema region of the lateral marrow. Historically, options for evaluation include a skull x-ray, computed tomography, and observation in the emergency room or hospital. CT is the imaging choice in patients with minor head trauma, although magnetic resonance (MR) is more sensitive to detect thin lesions. The question of how patients with head trauma should undergo screening has been controversial since the introduction of computed tomography (CT) in the early seventies. Two studies, based on clinical findings, have not indicated the required clinical findings of CT use in 96 percent of patients with abnormal CT, and none of the patients with abnormal CTDs detect none of the neurosurgery. Studies are required to develop guidelines based on clinical features after mild head trauma predicted that the likelihood of intracranial injury is high.

CONCLUSION:

Vomiting in Posttraumatic patients has significantly higher frequency of intracranial injury in the computerized tomography of the brain. These results support the inclusion of research in vomiting in guidelines for the treatment of small head injuries.

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