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Headache Associated with Epileptic Seizures: Epidemiology and Clinical Characteristics

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Abstract: ***Introduction****: Epilepsy and headaches are the common neurological disorders that co-occur more often than would be expected by chance. The re occurrence of epilepsy and headaches has become a concern issue as it frequently brings uncertain symptoms and outcomes in different ages.* ***Objective:*** *Our aim is to analyze the frequency of epilepsy related headaches, classify these headaches, and arid to classify seizure among the epilepsy related headache patients.* ***Methodology:*** *The study was conducted in Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka for around two years. Total 376 epileptic patients were examined with the age limitation from 18 to 36 years.* ***Result:*** *Seizures initiated to appear in epilepsy patients with headache including 80 percent of tonic clonic seizure (GTCS). Furthermore, post ictal headaches were found in the maximum patients rather than pre ictal headaches.* ***Conclusion****: further studies need to implement in the large population in order to identify the associated risk factors and to examine the findings.*

Keywords: *Epilepsy, Headaches, Seizure, Post ictal, Pre ictal, Symptoms*

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I. Introduction

Epilepsy is a central nervous system (CNS) disorder in which brain activity becomes abnormal and causing seizures and periods of unusual behavior, sensation and loss of awareness. It is a chronic disorder. Seizure is the sudden attack of illness specially stroke. Epilepsy like stroke can affect human behavior or the way of seeing things for a short time. The main symptom of epilepsy is repeated seizures. The patients can also suffer from a convulsion with no temperature, unresponsiveness to an instruction or question, confused memory, the patient becomes stiff suddenly for no reason, sudden bouts of chewing, extreme tiredness and so many. There are some factors that can risk epilepsy. They are: head trauma, strokes or tumors, infectious diseases (for example AIDS or viral encephalitis) brain damage during birth, autism or neurofibromatosis.

People have been aware of a link between epilepsy and migraines for centuries. In 1898, an editorial in the Journal of the American Medical Association underlined the need to find 'a plausible explanation of the long recognized affinities of migraine and epilepsy'.

Epilepsy and headache are paroxysmal disorder. The prevalence of epilepsy is 0.5% to 1% in men and women and of migraine is 15% to 17% in women and about 6% in men. The Epidemiological studies indicate that an association of migraine and epilepsy with an increased prevalence of migraine in patients with epilepsy and vice versa[1]. This association is reputed but poorly understood about the relationship between epilepsy and headache. 2-fold increased risk for migraine in patients with epilepsy as compared to their first-degree relatives without epilepsy was found. There are also so many case reports and reviews that describe several conditions in which migraine and epilepsy coexist. To observe different seizure patterns pre-ictal headache was studied. They are pre –ictal (PIA), ictal (IHA) or post-ictal (PostIHA).

***Figure: 1*: Epilepsy is a Central Nervous System disorder.**

Ictal headaches are headaches associated with seizure activity. They may occur either before (pre-ictal) or after (post-ictal) a seizure, and in rare circumstances during a seizure. Migraine aura-induced epileptic seizures were found in 11.3% to 16.5% of patients with comorbidity. Migraine like headache was observed in 55.7% of patients with pre-ictal headache, and a history of (seizure-independent) migraine was significantly more frequent in these patients as compared to patients with other seizure associated headache types [2,3].
For some people with epilepsy, symptoms of depression act as an aura. An aura is a warning sign that a seizure is coming. Patients feel depressed for several days after a seizureor it may experience long-term depression. Depression can potentially affect at any time. Spreading depression is a pathophysiological phenomenon which was observed in an epilepsy model after electrical or chemical focal stimulation of animal cortex. A corresponding velocity was found in scintillation-scotoma propagating from the center to peripheral parts of the visual field in migraine aura[1].

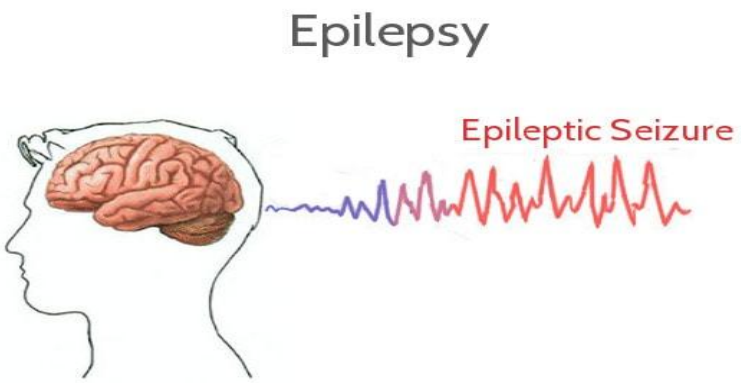

***Figure: 2*: Epileptic Seizure**

Neuronal hyperexcitability disposes to the occurrence of spreading depression in migraine aura. Migraine with aura and focal epilepsy syndromes with focal or secondarily generalized seizure types might be overrepresented in a co morbid condition as compared to the isolated conditions of migraine and epilepsy. Further on, an altered brain state with neuronal hyperexcitability might also result in an increased severity of migraine attacks. Patients are usually more concerned by their seizures, and headaches associated with epilepsy are often neglected, not only by the patient, but also by the physician. Few previous studies characterized headache types and IHS in large populations of individuals with well-defined forms of epilepsy[4] .This study showed the frequency of headache in epileptic population and characteristics of headache whether it was pre-ictal, ictal or post-ictal. This study also analyzed symptoms which were accompanying.

II. Objective

General Objective:

- To analyze the frequency of epilepsy related headaches, to classify these headaches, arid to classify seizure among the epilepsy related headache patients

Specific Objective

- To determine the association of the epilepsy symptoms with different seizures.
- To evaluate the headache and epilepsy relation among pre-ictal and post-tctal headache patients.

III. Methodology

Table-1: ***Study type, place of study, duration, sample size and sampling technique***

Study type	Place of Study	Study Period	Sample size	Sampling Technique
Cross sectional observation	Department of Neurology, Bangabandhu Sheikh Mujib Medical University (BSMMU), Shahbag, Dhaka.	2 years	376 epileptic patients	Purposive sampling.

Table-2: ***List of Variables***

Demographical variables:	**Habitual variables:**	**Variable associated with seizure:**	**Variable associated with headache:**
a) Age **b) Sex** **c) Occupation** **d) Marital status** **e) Educational status**	a) Smoking habits b) Betel nut chewing c) Patients with oral contraceptive drug (female)	a) Seizure frequency b) Age at epilepsy onset	a) Relation with seizures b) Side of HA (right or left) c) Location (frontal, temporal, occipital) d) Spread (ipsilateral, contralateral) e) Intensity (VAS)

Table-3: ***Selection criteria***

Inclusion criteria	Exclusion criteria
1. **Age of patient above 18 years and up to 36 years.** 2. **Participants who gave consent and willing to comply with the study procedure.** 3. **Ability to cooperate and understand written and oral information.** 4. **Definite diagnosis of epilepsy.**	1. Patients who refused to be included in the study. 2. Any condition requiring comprehensive care. 3. Lacking ability to take part in the study as a whole. 4. Age below 18 years and above 36 years. 5. Patients who had previous headache other than epilepsy related headache.

Ethical consideration:

Prior to the commencement of this study, the research protocol was approved by the thesis committee (Local Ethical committee). The aims and objectives of the study explained to the patients in easily understandable local language and then informed consent was taken from each patient. It assured that all informed and records were kept confidential and the procedure was helpful for both the physician and the patients in making rational approach of the case management.

Data analysis procedure:

- Data were collected by semi-structured questionnaire.
- Data were collected by face to face interview.
- Data was collected by the researcher himself.
- After collection, data were checked for inadequacy, irrelevancy, and inconsistency.
- Irrelevant and inconsistent data were discarded.
- All data were recorded systematically in preformed data collection form.
- Quantitative data were expressed as mean and standard deviation.
- Qualitative data were expressed as frequency distribution and percentage.
- Statistical analyses were performed by using SPSS for windows version 13.0.

IV. Result

Table 4 illustrates the distribution of the total 170 patients according to their age and percentage. Among them, most of 52.4% were up to 20 years age group followed by 17.6% within 21 to 25 years, 20.0% within 26 to 30 years, 4.7% within 31 to 35 years and 5.3% 36 and above age group. Mean (SD) age of the respondents was 23.44 ± 5.49 years. All patients were within 18 to 36 years age range.

Table-4: ***Distribution of the patients by age (n=170)***

Age (in year)	Number	Percent
20	89	**52.4**
21-25	30	**17.6**
26-30	34	**20.1**
31-35	8	**4.7**
36	9	**5.2**
Total	**170**	**100**

Mean ± SD (range) = 23.44 ± 5.49 (18-36)

Here, table 5 and table 6 are presenting different types of seizure among 170 patients. Out of all patients 80.0% had generalized tonic clonic seizure (GTCS), 8.8% had complex partial seizure (CPS), 5.9% had single partial seizure (SPS) and 5.3% had some other types of seizure.

Table 5: ***Types of Seizure***

Types of Seizure	Percentage
Tonic Clonic Seizure (GTCS),	80
Complex Partial Seizure (CPS),	8.8
Single Partial Seizure (SPS)	5.9
Other Types Of Seizure.	5.3

Table 6: ***Distributions of patients by type of seizure (n=170)***

Type of seizure	Number	Percent
Generalized tonic clonic seizure (GTCS)	136	**80.0**
Complex partial seizure (CPS)	15	**8.8**
Simple partial seizure (SPS)	10	**5.9**
Others	9	**5.3**
Total	**170**	**100.0**

Here, table 7 and figure 3 are showing the distribution of patients by ictal headache among 170 patients. The overall incidence rate of post-ictal headache is 80.6% and pre-ictal headache is 19.4%

Table 7: ***Distributions of patients by ictal headache (n=170)***

Headache	Number	Percent
Pre ictal	33	19.4
Post ictal	137	80.6
Total	170	100

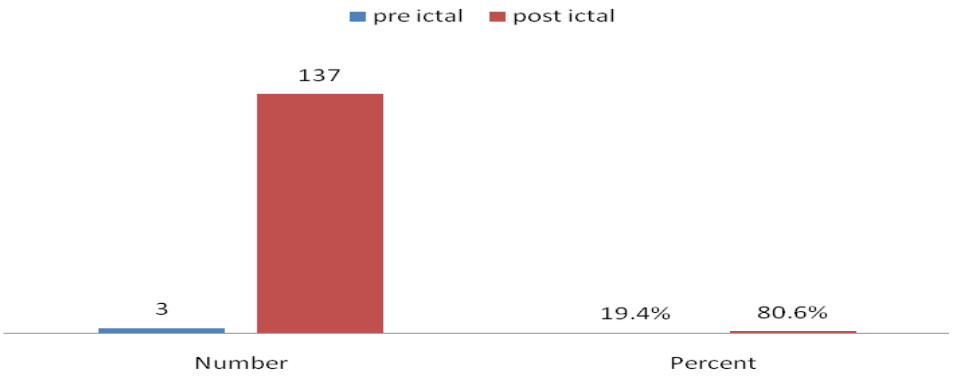

Figure 3: **Distribution by patients by headache**

Here, all bar charts are presenting various characteristics of postical headache among 137 patients.

Figure 4,5,6,7 and 8 illustrate that all patients of post-ictal headache 6.6% had right side, 10.9% had left sided and 82.5% had both sided pain. Within this group 48.9% had frontal headache, 16.8% had occipital headache and 34.3% had temporal headache. Ipsilateral spread of headache was observed in 59.1% patients and contralateral spread in 40.9% patients. Pulsating, pressure/tightening and alternate pulsating/tightening of headache was observed in 51.8%, 42.3% and 5.8% patients respectively Of all patients of post-ictal headache 26.3% had mild, 63.5% had moderate and 10.2% had severe headache.

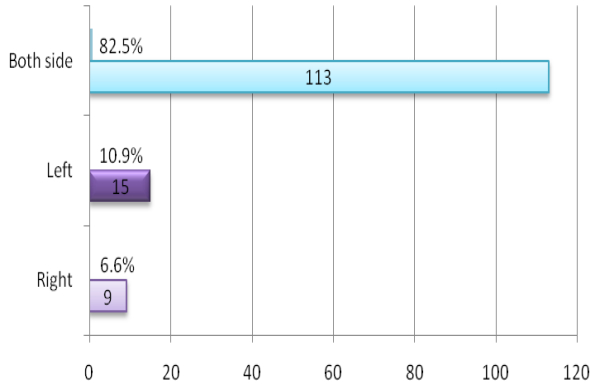

Figure 4: **Side of headache**

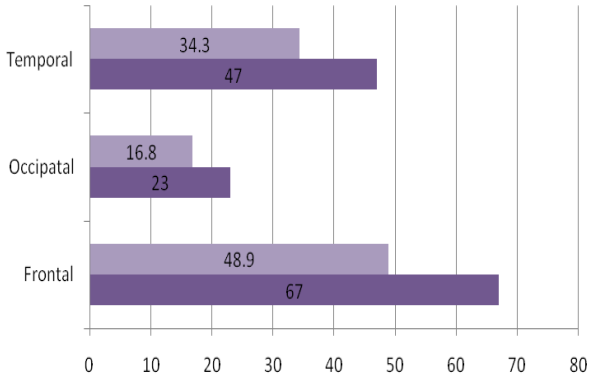

Figure 5: **Location of headache**

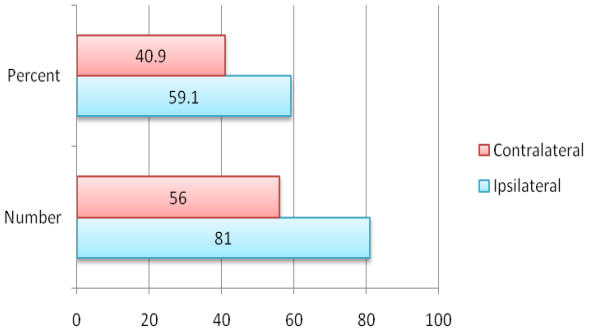

Figure 6: **Spread of headache**

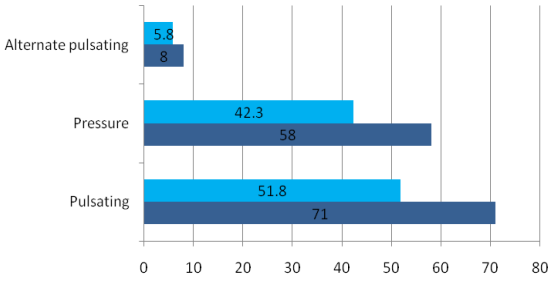

Figure 7: **Character of headache**

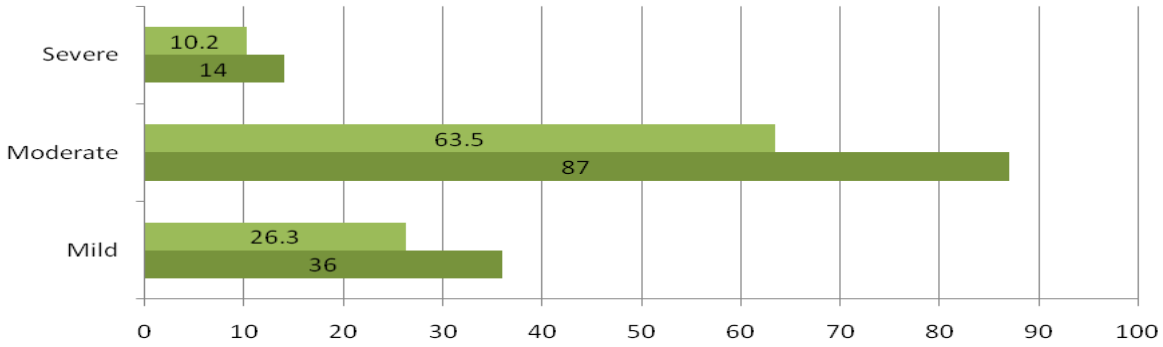

Figure 8: **Headache intensity**

Figure 9, 10, 11, 12 and 13 illustrate among the pre-ictal headache 6.1% had right side, 9.1% had left sided and 84.8% had both sided pain. Within this group 42.4% had frontal headache, 15.2% had occipital headache and 42.4% had temporal headache. Ipsilateral spread of headache was observed in 63.6% patients and contralateral spread in 36.4% patients. Of all patients of pre-ictal headache 27.3% had mild and 72.7% had moderate headache. Pulsating, press tire/tightening and alternate pulsating/tightening of headache was observed in 48.5%, 48.5% and 3.0% patients respectively

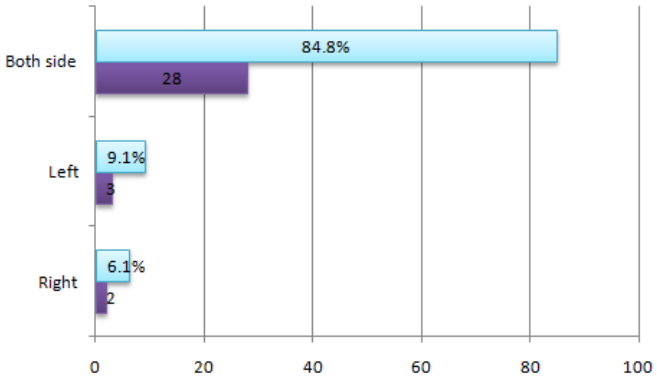

Figure 9: **Side of headache**

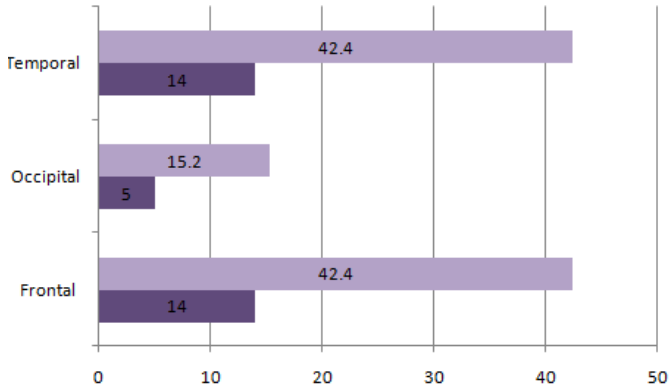

Figure 10: **Location of headache**

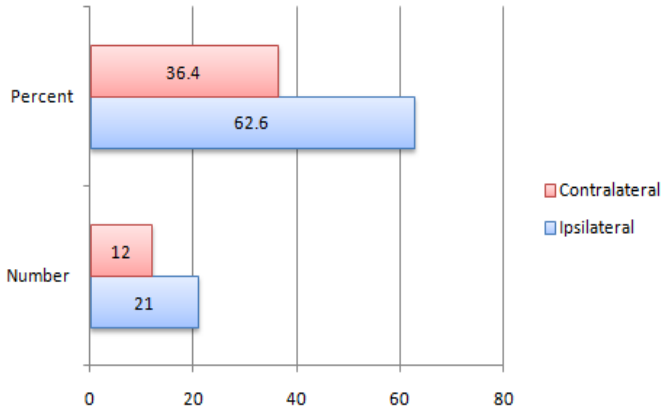

Figure 11: **Spread of headache**

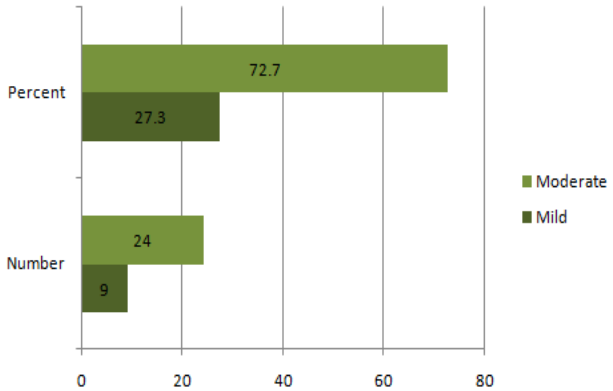

Figure 12: **Headache intensity**

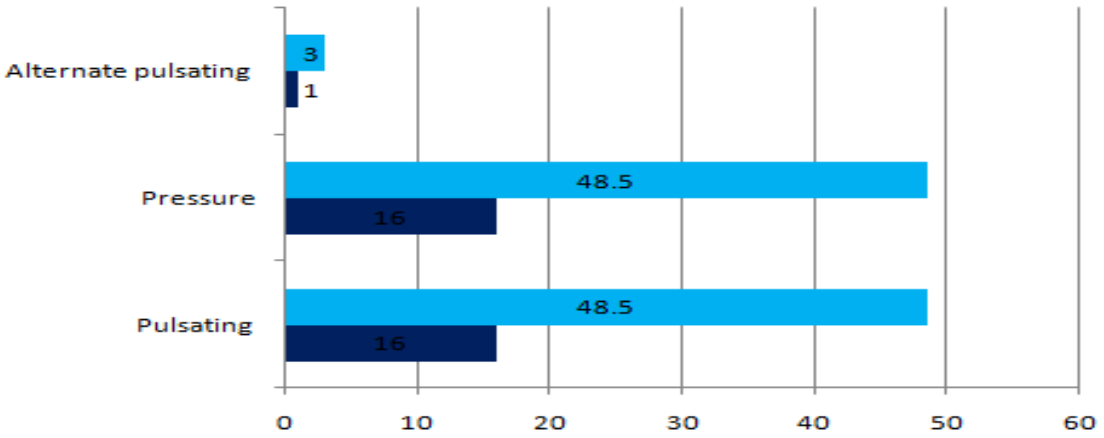

Figure 13: **Character of headache**

V. Discussion

A study of epilepsy related headache was completed to discover the recurrence of migraine in epileptic populace, features of headache whether it was preictal, ictal and postictal and furthermore to examination the going with side effects for around two years starting from January 2007 to December 2008. In this investigation 376 epileptic patients were selected between the age 18 to 36 years and among them 170 patients appeared with headache.

Patients were inside 18 to 36 years age run. Throughout the patients, 52.4% were up to 20 years age gathering, trailed by 17.6% between 21 to 25 years, 20.0% inside 26 to 30 years, 4.7% between 31 to 35 years and 5.3% 36 or more age gathering. Mean (SD) age of the respondents was 23.44 ± 5.49 years. In another study, the arrangement normal age was 35.2 years[4]. Beside there is a report that arrangement mean (±SD) of the investigation populace was 24 ± 11.9 years, which is reliable with the present study[5].

In the present examination 80.0% had summed up tonic clonic seizure (GTCS), 8.8% had complex halfway seizure (CPS), 5.9% had straightforward incomplete seizure (SPS) and 5.3% had some others kind of seizure. A report suggested that arrangement 9 (6.66%) had SPS, 30 (22.22%) had CPS, 30 (22.22%). had CPS+GTCS, 40 (29.62%) had Secondary GTCS, 20 (14.81%) had Primary GTCS and 6 (4.44%) had Primary non convulsive seizure (NCS)[5]. The present examination isn't similar with their investigation presumably because of superstition less neediness and inability to go to the epilepsy facility.

In the present arrangement the incidences of post ictal headache were 80.6% and pre ictal headache were 19.4%. Postictal migraine was accounted for in 44% in arrangement[6]. A study revealed that out of 341 patients with epilepsy 115 patients (34%) had epilepsy related cerebral pain and that 64 patients (56% of patients with seizure-related cerebral pain), 19% of aggregate patients whined about headache like seizure-related migraine[3]. In different reports 41—53% of patients with postlHA[7,8,9]. An evidence demonstrates that 47 (43%) of 110 successive patients announced cerebral pains related with epileptic seizures[4]. Most of the patients (n=43) had solely postictal cerebral pains. The present investigation additionally demonstrated the comparative outcome.

Out of all patients of post-ictal migraine 6.6% had right sided, 10.9% had left sided and 82.5% had both sided torment. Inside this gathering 48.9% had frontal cerebral pain, 16.8% had occipital migraine and 34.3% had fleeting cerebral pain. Ipsilateral spread of cerebral pain was seen in 59.1% patients and contralateral spread in 40.9% patients. Furthermore, others demonstrated that privilege sided cerebral pain was 8.0%, left sided migraine 14.0% and both sided migraine 76.0% and frontal cerebral pain 40.0% which were almost consistent with display examine[4]. Out of all patients of post-ictal cerebral pain of present arrangement 26.3% had mild, 63.5% had moderate and 10.2% had serious migraine.

Among the respondent with pre-ictal migraine 6.1% had right side, 9.1% had left sided and 84.8% had both sided pain. Inside this gathering 42.4% had frontal migraine, 15.2% had occipital cerebral pain and 42.4% had worldly cerebral pain. Ipsilateral spread of cerebral pain was seen in 63.6% patients and contralateral spread in 36.4% patients. Of all patients of pre-ictal cerebral pain 27.3% had mild and 72.7% had moderate migraine. Throbbing, squeeze tire or fixing and substitute throbbing or fixing of cerebral pain was seen in 48.5%, 48.5% and 3.0% patients separately. Of the 48 patients of post-ictal cerebral pain in one study revealed that the migraine was evaluated as mellow in 12 (25%), direct in 14 (29%) and extreme in 18 (3 8%) [6]. The present

examination additionally demonstrated the comparable outcome in connection to mild and serious frame migraine.

VI. Conclusion

In conclusion, the present outcomes found from the clinical analysis from the patients confirmed that reoccurrence of the epilepsy in patients and its consequent symptoms are connected with the headache. The study was preliminary in nature due to its small sample size. But further studies of a larger number of subjects will be required to evaluate the findings properly. Moreover, it may unravel the risk factors associate with the epilepsy and headache if the present study can be conducted over a large population of vast area.

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