

## Determination of Prevalence and Etiology of Headache in Children in a Tertiary Care Centre in Rural Areas of Indore

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**Abstract:** Headache is the most common disorder encountered in general clinical practice. Headache is a heterogenous condition that varies wildly with respect to global severity and severity of individual attacks. The present study “The Prevalence rate and various causes of headache in children in tertiary care center in rural population, near Indore” is an observational study which was carried out in department of Paediatrics, Index Medical College, Hospital and Research Centre, Indore during the period of 18 months from January 2016 to June 2017. Total 150 cases were recruited in this study. In our study Amongst 150 patients, the most common age group affected was 10-12 years, 71 out of 150 cases (47.33%) were in this group, followed by 7-9 years with 38 out of 150 cases (25.33%) and 33 out of 150 cases (22%) between 13-15 years of age, which shows that cases of headache were more in the age group of 10-12 years. Out of 150 patients, 89 (58.9%) were females and 61 (40.10%) were males indicating clear female preponderance in comparison to males, which is also seen worldwide. In our study, 91 patients (60.66%) were from rural population since hospital is located in the rural setup and influx of patients from urban area is less, while studying it was found that, 22 (14.66%) Out of 150 patients had history of head injury as an etiology of headache, it is also a significant cause of headache in children as they have history of fall while playing. “Chi-Square Test” show significant difference for gender wise distribution in these cases with trauma as a cause of headache. ( $P < 0.05$ ) which is significant. In our study we also found that ENT related problems were also the cause of headache in children in which sinusitis is most common cause and statistically significant, with other causes being otitis, rhinitis and wax etc. Study also revealed that refractive error was most common cause of headache in children on ophthalmic evaluations, other causes being glaucoma and conjunctivitis.

**Keywords:** Headache, Prevalence, Etiology, Rural Areas.

### INTRODUCTION

Headache is a common and an emerging problem in late childhood and adolescent which results in increased school absenteeism. Headache or Cephalgia is pain anywhere in the region of head or neck. It is common during childhood and become more common and increase in frequency during adolescence. Headaches can result from any number of causes such as ophthalmic, genetic predisposition, trauma, an intracranial mass, a metabolic or vascular disease or sinusitis to name a few. Headache is a common reason why pediatric patients seek medical care as it has a significant impact on the lives of children and adolescents, resulting in school absence, decreased extracurricular activities and poor academic achievement.

Most of the children get an occasional headache and they are usually benign. On the other

hand, headache is a symptom of numerous conditions ranging from common cold, flu, severe conditions such as meningitis, stroke, or a brain tumor. Because of the range of possible causes, correct diagnosis is very important.

As in other parts of world, in India too, headache is one of the commonest presenting neurological complaints in the Pediatric outpatient department. Headaches most commonly encountered are primary headaches in which Migraine and Tension type tops the list. Common causes of these headaches include striving for academic excellence as well as emotional stress related to family, school, or friends. Other causes include eyestrain, neck or back strain due to poor posture and depression.

Headache is the most common disorder encountered in general clinical practice. Headache is a

heterogeneous condition that varies widely with respect to global severity and severity of individual attacks. Among the primary headaches, it has been seen that tension type headache is commonest type of headache encountered all over the world although there are global variations.

The burden of headache in children and adolescents is not so well measured. The association of headache with rural habitation and low income aggravates the problem in a number of ways.

- Low income households have limited access to health care, more so in rural areas as health care is relatively deficient in these places.
- People with headache disorders may not be fully productive, and hence would have lower earning potentials.
- As low income is also associated with low education, these families tend to neglect the problem through lack of awareness.
- Lack of access to professional health care encourages people to resort to home remedies or traditional therapies, which may not be appropriate.
- Even when people with headache do contact a health-care provider, inadequate professional education may lead to inappropriate management, ineffective treatment and improper referrals.

Supported by Lifting the Burden [1,2], a population-based survey was undertaken in Southern India (Karnataka State), using a standardized and validated methodology, as a project within the global

campaign against headache and as a first step in estimating the burden of headache in India.

### AIMS & OBJECTIVES

#### Aim

- To study the prevalence rate and various causes of headache in children.

#### Objectives

- To determine the various etiologies of headache.
- To decide the management plan of underlying etiology
- To suggest the feasible interventions.
- To advice preventive measures.

### HEADACHE CAUSES

There are numerous possible causes of headaches in children. The most common causes include the following:

- Viral or upper respiratory infections (including ear infections, the common cold, allergies, sinus infections, strep throat)
- Stress-related or stress-worsened headaches (eg, family or school problems)
- Minor head injury
- Migraine
- Tension

Only a small minority of children with headaches have a serious cause, such as a brain tumor or life-threatening infection [3].

### Headache Triggers

Diet	Stress
Chocolate	Times of intense activity
Aged cheeses	Loss or change (death, separation, divorce, job change)
Monosodium glutamate (MSG)	Moving
Aspartame (Nutrasweet)	Crisis
Caffeine	<b>Changes of environment or habits</b>
Nuts	Weather
Nitrites, Nitrates	Travel (crossing time zones)
<b>Hormones</b>	Seasons
Menses	Altitude
Ovulation	Schedule changes
Hormone replacement (progesterone)	Sleeping patterns
<b>Sensory stimuli</b>	Dieting
Strong light	Skipping meals
Flickering lights	Irregular physical activity
Odors	
Sounds, noise	

### MATERIALS & METHODS

The present study entitled “Determination of Prevalence and Etiology of Headache in Children in a Tertiary Care Centre in Rural Areas of Indore” was conducted in the Department of Paediatrics Medicine, Index Medical College Hospital & Research Centre, Indore, (M.P) during the period of January 2016 to June

2017. This is a Prospective Cross Sectional study performed on All Children (Age 5-15 Years) Presenting to Out Patient Department.

**SAMPLE SIZE**

A total 150 cases presenting with complain of Headache were recruited in this study and all the cases were investigated for various headache etiology.

After thorough history, clinical examination and appropriate investigation, final diagnosis was made.

**INCLUSION CRITERIA**

- Patients above 5 years of age and below 15 years of age of either sex presenting with chief complaint of headache.

**EXCLUSION CRITERIA**

- Patients below 5 years of age and above 15 years of age.

**METHODOLOGY**

- All patients presenting to Pediatric outpatient department and Inpatient department with chief complaints of headache will be included.
- Detailed history was taken and necessary clinical examination was carried out in all patients.
- Relevant investigations including a hemogram, cerebrospinal fluid analysis, Brain imaging (CT

Scan, MRI), Ophthalmic and ENT examination were done wherever indicated.

- After thorough history, clinical examination and appropriate investigations, final diagnosis will be made.

**PROCEDURE PLANNED**

- Written and informed consent will be taken from the guardian.
- The patient’s clinical history and examination findings will be recorded prospectively in a case record form.
- Relevant investigations including hemogram, cerebrospinal fluid analysis, brain imaging (CT SCAN, MRI), ophthalmic and ENT examination was done wherever indicated.

**INVESTIGATION DETAILS**

- Complete Hemogram
- CSF analysis (wherever indicated)
- Brain imaging i.e. CT SCAN/MRI SCAN (wherever indicated)
- Test for refraction and fundus examination
- ENT workup

**RESULTS**

**Table-1: Distribution of PPT factor in Headache according the their gender**

PPT Factors	Male (n=29)		Female (n=34)	
	No.	%	No.	%
Stress	8	27.59	6	17.65
Cough & Cold	6	20.69	6	17.65
Fever	3	10.34	8	23.53
Convulsion	3	10.34	0	0.00
Nausea & Vomiting	1	3.45	3	8.82
Hunger	2	6.90	3	8.82
Exertion	2	6.90	2	5.88
Heat	2	6.90	0	0.00
Menstrual Cycle	0	0.00	3	8.82
Emotion	1	3.45	0	0.00
Sound	1	3.45	1	2.94
Sleep Disturb	0	0.00	1	2.94
Smell	0	0.00	1	2.94
Total	29	100	34	100

Table No.6 and Graph 6 shows distribution if PPT factors in Headache according to their gender out of 150 of 63 patients having PPT factors in which 29 patients were males and 34 patients were females. PPT factors are stress in 14 patients, in which males patient

were 8(27.59%) and females were 6(17.65%) cough and cold in 12 patients and fever in 11 patients. Chi-Square Test revealed P value of 0.000(<0.05) which is significant.

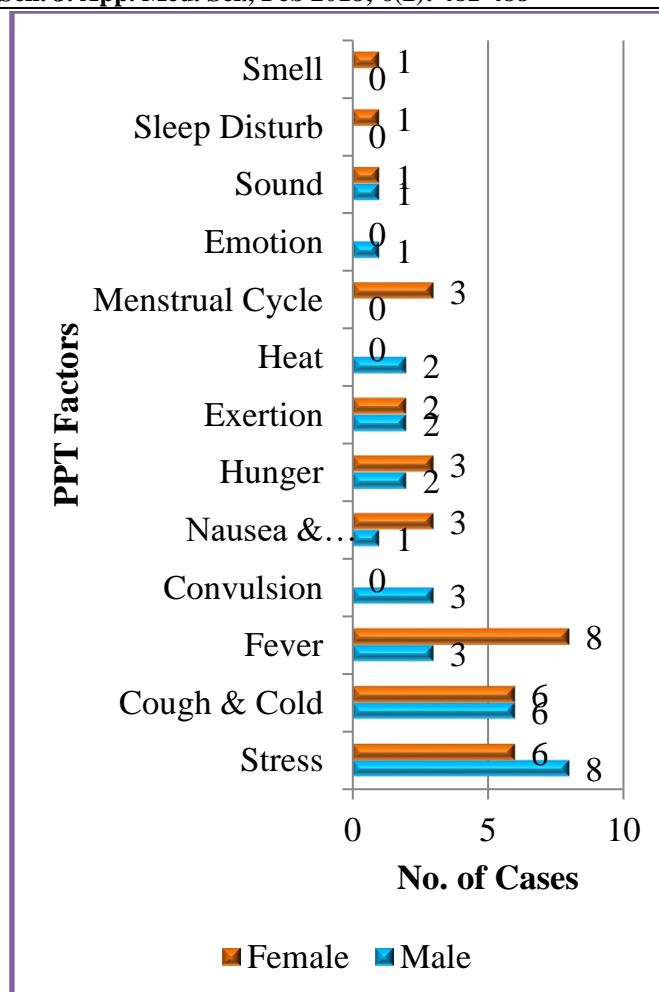


Fig-1: Distribution of Cases according to their Gender and PPT Factors

Table-2: Distribution of Different headache type

Different Headache Types	Male		Female		P value
	No.	%	No.	%	
Migraine	6	9.84	9	10.11	0.000
Tension Type Headache	16	26.23	11	12.36	0.008
Cluster Headache	3	4.92	2	2.25	0.000
Trigeminal Neuroglia	1	1.64	2	2.25	0.000
Psychogenic Headache	0	0.00	8	8.99	0.000
Secondary Headache	6	9.84	9	10.11	0.000
SOL	4	6.56	2	2.25	0.000
Glucoma	1	1.64	1	1.12	0.000
Head Trauma	2	3.28	0	0.00	0.000

Table 12 and graph 12 shows the gender wise distribution of different headache types. Tension type headache was most common with 27 cases in which 16 (26.23%) were males and 11 (12.36%) were females followed by migraine 15 cases in which 6 males (9.84%) and 9 females (10.11%).

3 Patients having trigeminal neuralgia in which 1 (1.64%) male and 2 (2.25%) females. 8 (8.99%) females patients has psychogenic headache. Chi square test ( $p < 0.05$ ) showed statistical difference for gender wise distribution of psychogenic headache. 5 patients in

which 3 males (4.92%) and 2 females (2.25%) had cluster headache. Chi square test ( $p < 0.05$ ) showed statistical difference for gender wise distribution of cluster headache.

1 male and 1 female patient had glaucoma. Chi square test ( $p < 0.05$ ) showed statistical difference for gender wise distribution of glaucoma. 6 patients had SOL in which 4 males (6.56%) and 2 females (2.25%). 2 males (3.28%) patient had headache due to head trauma. Chi square test revealed a p value of (0.000) which is significant.

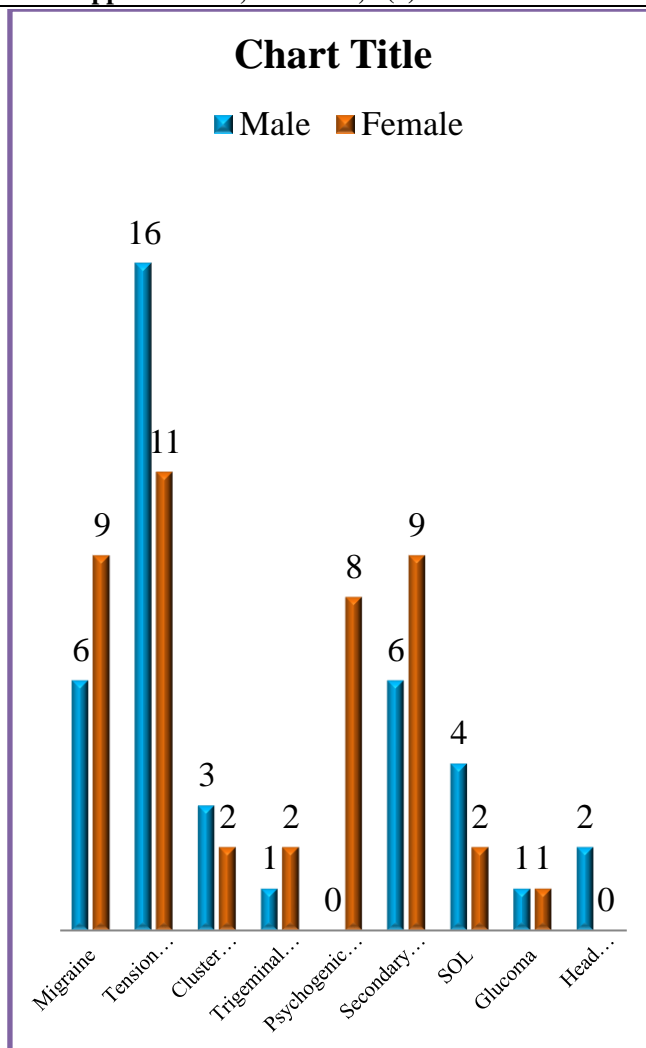


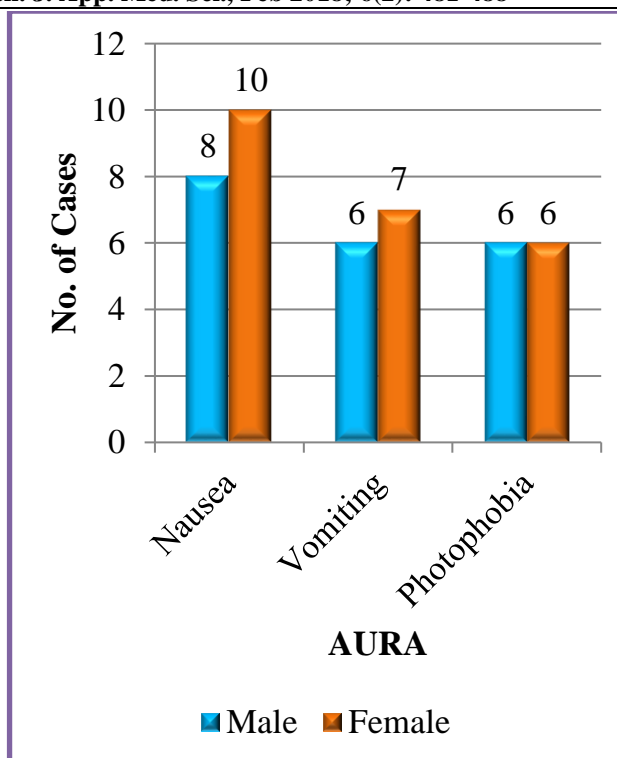
Fig-2: Distribution of Different headache type

Table-3: Distribution of Migraine according to their Gender with AURA

AURA	Male		Female	
	No.	%	No.	%
Nausea	8	5.30	10	6.62
Vomiting	6	3.97	7	4.64
Photophobia	6	3.97	6	3.97
Total	20	13.25	23	15.23

Table and graph 9 show distribution of migraine according to their gender with aura. 31 patient

out of 150 (20.6%) having nausea and vomiting and 12 patient out of 150 (8%) have photophobia.



**Fig-3: Distribution of Migraine and Headache (TTH) according to their Gender with AURA**

**DISCUSSION**

Present study “Prevalence and etiology of headache in children<sup>[3]</sup> in Tertiary Care Centre in rural population” near Indore was conducted in Department of Pediatrics, Index Medical College Hospital And Research Centre Indore during the period of 18 months from January 2016 to July 2017.

A total 150 cases presenting with complain of Headache were recruited in this study and all the cases were investigated for various headache etiologies.

After thorough history, clinical examination and appropriate investigation, final diagnosis was made.

**FAMILY HISTORY OF HEADACHE**

In present study, 17 male patients (11.33%) and 23 female patient (15.33%) having family history of headache. Total of 40 out of 150 (26.66%) showed positive family history.

Study concordance with another of Guidetti V, Galli F [4].

**DISTRIBUTION ACCORDING TO HISTORY OF HEAD TRAUMA**

In present study, out of 150 patients, 22(14.66%) patients who had history of trauma as an etiology of headache, out of which female were 14 (9.33%) which are more than males.

“Chi square test” showed significant difference for gender wise distribution of head trauma cases (p<0.05).

This finding was concordance to the study conducted by Aaseth *et al.* in which it was observed that the prevalence of headache attributed to head trauma was higher in females than males.

**FAMILY HISTORY OF MIGRAINE**

In present study it was observed that male to female distribution associated with family history of migraine was 14 males (53.85%) and 12 female (46.15%). Total 26 patients out of 150 cases having family history of migraine (17.33%). Chi square showed significant difference for gender wise distribution of migraine cases with family history (p<0.05).

The study conducted by T. Ahmed *et al.* in which family history of headache was most important factor associated with migraine headache.

**DISTRIBUTION OF PPT FACTOR IN HEADACHE**

In present study it was observed that various precipitating factors like cough and cold were in 12 patients out of 63, in which 6 were males (20.69%) and 6 were females (17.65%). Fever in 11 patients in which 3 were males (10.34%) and 8 were females (25.53%). stress in 14 patients in which 8 (27.5%) were males and 6 (17.65%) were females. other common precipitating factors in both group of patients were present, like convulsions, hunger, sound, smell, emotions, sleep disturbance, menarche, etc.



This finding was concordance with the study conducted by Chiag-I hung *et al.*, Brna [5] and coworkers<sup>5</sup> & Eqillious L. H *et al.* & Mac Gregor E A.

Study conducted by Eqillious L. H *et al.* the most common precipitating factor in both group of patients stress, tension, not eating on time, fatigue and lack of sleep, weather, smell, smoke and light were other precipitating factors.

Mac Gregor E A, Lieba-samal D, Kornea-Horwig B study conducted by 3 authors records the impact of sex hormone on migraine in females.

Lieba-Samal D and Kornea Horwig B have analyses that the onset of menarche increases the risk of development of migraine and headache. Increased incidence of headache was found in girls who had attained menarche that with girls yet to reach menarche.

Aegidius *et al.* [6] examined the relationship between age at menarche and headache prevalence. The prevalence of headache is higher in girls with menarche at 12 years or younger than in those with menarche after age of 12 years. In addition they found a statistically significant trend towards decreased prevalence of headache, migraine and tension type headache with increase age of menarche.

#### DISTRIBUTION OF HEADACHE TYPE

On studying the various subtypes of primary headache it was observed that, the prevalence of headache was 37.5% tension type headache was most common in 27 in which 16 (26.23%) were males and 11 (12.36%) were females cases, p value being 0.008, followed by migraine 15 cases in which 6 (9.84%) were males and 9 (10.11%) were females. P value 0.000.

This is similar to the study conducted by Shengyuan Yu *et al.* in China which reported that among 94.1% respondents of 5041 subject questioned, 1425 had 1 year prevalence of headache. Among whom 1200 were diagnosed to have primary headache.

Study conducted by H. Fallahzadeh *et al.* [7] in Iran in 2011 result of study was total 180 [252 (53.3%)] males & 222 (46.2%) female students (93.7%) were evaluated. The prevalence of headache was 58.7%. The prevalence of migraine, tensions type headache was 14.2% [10.5% in male vs 18.5% in female, P=0.08 & 44.2% (49.2% in males vs 39.2% female. P=0.006) respectively.

Andre *et al.* in there project studied the epidemiology of various primary and secondary headache & found that most prevalent diagnosis were of migraine (37.98%) TTH 26.65% & cluster headache (2.75%).

In the present study none of the male patients were having psychogenic headache, while 8 (8.99%) female patient were diagnosed with the same. chi-square test ( $p < 0.05$ ) showed statistical difference for gender wise distribution.

We could not find any previous study with which the gender distribution of psychogenic headache could be compared but it is widely believed that psychogenic headache takes place mostly in females because of greater amount of emotional liability.

In present study 3 (4.92%) male patients and 2 (2.25%) female patient were diagnosed with cluster headache. Chi-square test ( $p < 0.05$ ) showed significant difference for gender wise distribution of cluster headache cases.

Both males and females weren't equally affected for cluster headache. This finding was concordance with study of Paola *et al.* who observed that the estimated prevalence rate of cluster headache was 227/100,000 (95% CI; 104-431) in women and 338/100,000 (95% CI; 175-592) in men.

In present study, one (1.64%) male patient & 2 (2.25%) female patients were diagnosed with trigeminal neuralgia. Chi-square test showed significant difference for gender wise distribution of trigeminal neuralgia cases ( $P < 0.05$ ).

These findings are in concordance with the study conducted by Isabela *et al.* had reported in their study a higher prevalence of trigeminal neuralgia in female. The proportion between female and male who had trigeminal neuralgia was 3:1.

In our study one male and one female patient were diagnosed with glaucoma. Chi-square test showed significant difference for gender wise distribution of glaucoma cases ( $p < 0.05$ ).

Both males and females were same for rate of glaucoma. Similar finding was reported in a study conducted by Barbara *et al.* who reported that there was an increase in frequency of open angle glaucoma with increase in age but there is no sex determination.

#### DISTRIBUTION OF CASES ACCORDING TO OPHTHALMIC PROBLEM

In present study 45 patient out of 150 patient (30%) having ophthalmic problem. In which 23 males and 17 female patients having refractory error and 2 female patients having glaucoma, 3 having other ophthalmic complain including conjunctivitis, uveitis.

This is in concordance with the respective study conducted by Arsen Akinci *et al.* total prevalence of refractive errors was higher in the headache group ( $P < 0.0001$ ).

## CONCLUSION

Headache is a common and an emerging problem in late childhood, and adolescence. Headache ranks 3<sup>rd</sup> among the illness which are related to school absenteeism and decrease in daily activities

This is the study on prevalence rate and various causes of headache in children in rural population near Indore. On the basis of our study we conclude that headache is most prevalent in females than males, and the age group being 10-12 yrs to be the most common.

Out of all the causes of headache, primary headache is most common one with maximum prevalence of Tension Type Headache followed by Migraine.

Overall prevalence of headache due to migraine with aura was found to be common in females.

Previous literature shows that there are many precipitating factors found in headache like Stress, fever cough and cold which was also found in our study.

Our aim was to find the prevalence and different causes of headache in our study and also to educate the patient and parents & guide them regarding prevention of headache in preventable causes and avoid certain precipitating factors like exposure to heat sunlight, watching TV for longer duration, which cause headache. Children should be immunized according to schedule to avoid upper respiratory and ear infections. Patient with refractive error and other ophthalmic and ENT problems can be treated on time or referred on time to avoid further headache and deterioration. Regular school health check - ups and ophthalmic screening should be done for all school going children in age group 5-12 yrs to timely identify refractive error and prevent headache.

CNS tumors were also found to be the cause of headache which was although statistically insignificant, but is considered to be the most serious cause of headache. Timely referral, complete examination, awareness and high index of suspicion can lead to early diagnosis and cure.

The short comings of this study were that we could not regularly follow up of the patient's final outcome which was not possible in this cross sectional study. Secondly it was a hospital based study where patient of specific diseases are referred, so all types of headache could not be evaluate properly. Thirdly the hospital is situated in rural setup so majority patients belong to low social economic status in which lack of awareness and financial instability leads to neglect of disease, incomplete investigations & noncompliance regarding treatment.

So headache should not be neglected in children, diagnose them and treat early which will improve their performance and can lead to normal school life.

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