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THE CLINICAL SPECTRUM OF PATIENTS WITH PRIMARY AND SECONDARY HEADACHE PRESENTING TO - A TERITARY CARE CENTRE

Internal Medicine

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ABSTRACT

Background: Headache is a very common complaint of the patients visiting ER. The International Headache Society has published a system of classification and operational diagnostic criteria for headache. Common types of primary headache include tension type headache, migraine headache, cluster headache, idiopathic stabbing headache, exertional headache and others. Common causes of secondary headache include systemic infections, head injury, vascular disorders, subarachnoid hemorrhage etc. **Methods:** A cross-sectional observational study study, (n=150) was conducted to evaluate the clinical spectrum of patients presenting with headache. We aimed to identify the clinical and demographic characteristics and frequency of occurrence associated with various types of primary or secondary headaches and also assess the response to therapy. We also aimed to identify the clinical and imaging features of various types of secondary headache. **Results:** In our study, most common primary headache was migraine which includes chronic migraine, migraine with aura, migraine without aura. Next most common type of primary headache was tension type headache. Majority of our subjects ,47.33% were in the age group of range 21-30 yrs whereas only 3.33% study subjects were in the range of 61-70yrs. There was a female preponderance in both primary (70.67%) and secondary (73.33%) headache groups. In both the primary headache and secondary headache group majority of the study subjects had duration of headache less than 1 year and with a frequency of less than 5 per month. The mean duration of each episode of Primary headache was 11.21±7.58 hours, in contrast to 11.45±7.56 hours in Secondary headache. Most common precipitating factors identified were bright light followed by lack of sleep. Most common neuroimaging findings in our study were glioma/ICSOL, and stroke followed by chronic meningitis on CT scan. There were no abnormal focal findings in the Primary headache group. Whereas in secondary headache group 03 subjects had altered sensorium, 05 subjects each had dysarthria, 15 subjects had cranial nerve deficits, 10 subjects had abnormal motor findings, 05 subjects had involuntary movements and 06 subjects had positive cerebellar signs. **Conclusion:** Detailed clinical history is necessary for the patients presenting with headache as their primary complaints and timely radiological investigations are necessary for diagnosis of the etiology of the headache. Non pharmacological measures, like avoidance of known common triggers of headache can prevent considerable disability.

KEYWORDS

Primary Headache, Secondary Headache, Migraine, Tension type Headache

INTRODUCTION

On a global basis, headache is responsible for more disability than any other neurological problem (1). It is imperative for physicians evaluating adult patients with headache to determine whether the condition is benign or it indicative of a serious neurologic or systemic pathology. The most common types of headaches are tension-type headaches, migraines and cluster headaches, which affect approximately 40, 10, and 1 percent of the adult population respectively(1)(2).

Most primary headache diagnosis are based entirely on the patient history. Additionally physical examination provides clues to the diagnosis usually by ruling out certain features (3). The International Headache Society has published a system of classification and operational diagnostic criteria for headache based on clinical consensus (4). The primary headache disorders include migraine, tension-type headache (TTH), trigeminal autonomic cephalalgias (TACs) . The secondary headaches include intracranial space-occupying lesions (ICSOLs), infections of the central nervous system mainly meningitis or encephalitis, subarachnoid hemorrhage, giant-cell arteritis, cerebral venous thrombosis and idiopathic intracranial hypertension (5). A sudden onset of exploding headache (thunderclap) that peaks within a minute should be investigated for subarachnoid hemorrhage, especially when there is no previous history of such attacks. Recurring thunderclap headaches are unlikely to be serious, for example headaches during sexual intercourse (orgasmic headache or coital migraines). These can be effectively treated with conventional migraine prophylaxis (6). Chronic daily headache, daily or near-daily headache for months to years, is widely reported in the literature, yet is not an official diagnosis in the International Classification of Headache Disorders. Chronic daily headaches of long duration include chronic migraine, chronic tension-type headache, hemicrania continua and new daily persistent headache. Worldwide prevalence of chronic daily headache has been consistent at 3%- 5% most of which likely represents chronic migraine (7). The pathophysiology of secondary headache depends on the underlying process (8).

The most critical aspect of headache diagnosis is history taking. It is very important to begin with open-ended questions when obtaining a headache history, which should include frequency, duration, location, quality, severity, associated symptoms (eg-photophobia, phonophobia, nausea, and vomiting) and co morbidities, including head and neck symptoms and hormonal status (9). Common comorbidities of headache including sleep disorders, psychiatric conditions (eg: anxiety or depression) and vascular conditions should be reviewed to help in guiding the diagnostic and management plans (10). A minority of headache patients have a secondary headache disorder. Using the systematic **SNNOOP10** list (it includes Systemic signs, Neurologic findings, Onset-sudden, Onset < 5 yrs or > 65 yrs, Pattern changes, presence of papilledema, Pregnancy associated new headache or change in headache during pregnancy and lastly Presence of a rare Phenotype -like TAC's) to screen new headache patients will presumably increase the likelihood of detecting a secondary cause (11).

Non-pharmacological interventions are an important part of the treatment for some headache patients. Intake of provocative food items such as red wine, dark chocolate and certain cheeses may in some patients have an effect, although there is no clear evidence for this (12). No definite difference has been demonstrated in the effect between simple analgesics (paracetamol, NSAIDs and acetylsalicylic acid) alone or in combination with antiemetic and triptans. Simple analgesics, if necessary combined with antiemetics, are therefore the first choice. Many of the patients who have insufficient effect of simple

analgesics have good effect from triptans(13). Headaches can be broadly classified as follows:

PRIMARY HEADACHE	SECONDARY HEADACHE
Most common are Migraine, Tension-type headache and the Trigeminal autonomic cephalalgias, notably Cluster headache (14). Tension-type headache (TTH)-chronic head-pain syndrome characterized by bilateral tight, band-like discomfort. The pain typically builds slowly, fluctuates in severity and may persist more or less continuously for many days. The headache may be episodic or chronic (present >15 days per month) (15). Migraine, the second most common cause of headache and the most common headache-related and neurologic cause of disability in the world (16), afflicts approximately 15% of women and 6% of men, over a 1-year period (17)(18). It is usually an episodic headache associated with certain features -sensitivity to light, sound or movement, nausea & vomiting often accompany the headache (19). Cluster headaches are rare and brief (15 to 180 minutes) episodes of severe head pain with associated autonomic symptoms. The age of onset varies with 70 percent of patients reporting onset before 30 years of age (20).	Infections Neoplasms of the brain Brain abscess Subarachnoid hemorrhage Giant cell arteritis Intracranial hypertension Posterior fossa Malformations Chiari malformation Post dural puncture headache; Hypertension-related disorders (e.g., preeclampsia); Cerebral sinus thrombosis; Hypothyroidism Carcinoid syndrome Pheochromocytoma

This study is being conducted to evaluate the clinical spectrum of patients with primary and secondary headache in a tertiary care government hospital in northern India.

We aim to identify the clinical and demographic attributes associated with various types of primary or secondary headaches and to assess the frequency of occurrence of various types of headache among our patients. We also aim to identify the clinical and imaging features of various types of secondary headache.

AIMS & OBJECTIVES

AIM

- To assess the clinical spectrum of patients with primary and secondary headache presenting to AHRR

OBJECTIVES

- Determine the types of headache disorders presenting to AHRR
- Frequency of occurrence of various types of headache among different age groups and sexes
- Define the imaging features of various secondary headaches

MATERIALS AND METHODS

Study design: This study is a cross-sectional observational study.

Study site & population: Study will be carried out at Neurology department, AHRR

Study duration: October 2020- July 2022

Sample size:

The sample size was calculated as per the prevalence of headache. As per the previous studies the prevalence of overall headache was 3 % (based on study by Daifallah Almalki (21), the maximum error in the estimate will tolerate upto, ± 5%, at 2-sided test with 95% confidence level(α=5%), expected sample size was 45 patients but to increase the power of study, total 150 sample size was taken.

For estimation of sample size, the following formula has been used $n = [Z\alpha^2 PQ]/d^2$

$=3.84* 0.03*0.97/0.05*0.05$

$= 3.84* 291/25= 1117/25= 45$

The sample size estimated is 45, but to increase the power of study we increases sample size to 150.

Where; Zα = Value of standard normal variate corresponding to α level of significance,

P = prevalence
Q = 1 – P,
d = Margin of errors which is a measure of precision Assumptions:
P = Prevalence of overall headache = 3 %
Zα = 1.96 (Corresponding to 95% confidence interval) Precision (d) = ± 5.0%

Sample technique: Systematic sampling

METHODOLOGY:

The study was conducted in the Department of Medicine & Neurology, Army Hospital (R&R). Nature, methodology and risks involved in the study was explained to the patients and informed consent obtained. All patients who qualify the inclusion criteria were enrolled for study.

The questionnaire consisting details of occupation, frequency, intensity, duration, laterality, character of pain, associated symptoms, aggravating factors and family history was administered. Detailed examination with reference to general condition, refractory error, fundus examination, neck movements and CNS examination were done.

Specialist opinion in ENT, ophthalmology and psychiatry was obtained wherever indicated for the patients. International Classification of Headache Disorder IV criteria was applied to classify headache.

Inclusion Criteria:

- All patients with age 18 years and above
- All study subjects with either primary or secondary type of headache

Exclusion Criteria:

- Patients unwilling to participate in the study.
- Headache located or transmitted to the cranium from the maxillo / mandibulofacial region, pharynx, paranasal sinuses, neck and ear were excluded.

Statistical Methods:

Statistical analysis were carried out with the help of Microsoft Excel and Epiinfo7.1 software. The description of the data was done in the form of arithmetic mean +/-SD (or median) for quantitative data while in the form of frequencies (%) for qualitative (categorical) data. P-values of < 0.05 was considered significant. For comparison of categorical variables (i.e. to examine the associations between qualitative/quantitative variables) chi-square test was used.

OBSERVATIONS AND RESULTS

This study was a cross-sectional observational study over a period of 18 months. 150 patients having complaint of headache, admitted in the hospital or attending outpatient department were recruited in the study. In our study based on age group majority (47.33%) subjects were in the range 21-30 yrs,. The details are placed in table 1.

Table 1: Distribution of study subjects as per age

Age group	No	%
≤20 yrs	23	15.33
21-30 yrs	71	47.33
31-40 yrs	32	21.33
41-50 yrs	12	8
51-60 yrs	7	4.67
61-70 yrs	5	3.33
Total	150	100

In this study based on gender, there is female predominance in both primary (70.67%) and secondary (73.33%) headache. The details are placed in table 2.

Table 2: Distribution of study subjects according to gender

		Type of headache		Total
		Primary	Secondary	
Sex	F	53	55	108
	M	22	20	42
Total		75	75	150

Based on duration of headache in our study group, out of 75 in primary headache subjects 18 had duration of 3-6 months.In secondary headache, 16 subjects each had duration 3-6 months.

The details are placed in table 3.

Table 3: Distribution of study subjects as per duration of headache

		Type of headache		Total
		Primary	Secondary	
Duration of headache	<1 month	8	8	16
	>24 month	8	8	16
	1-3 month	8	9	17
	12-24 month	17	18	35
	3-6 month	18	16	34
	6-12 month	16	16	32
Total		75	75	150

In our study, as per frequency of headache episodes, in primary headache group out of 75, 33 subjects were had less than 5 per month. In secondary headache 34 patients had frequency <5. The details are placed in table 4.

Table 4: Distribution of study subjects as per frequency of headache

Frequency of Headache (per month)		Type of headache		Total
		Primary	Secondary	
	<5	33	34	67
	5-10	31	30	61
	10-15	5	6	11
	15-20	4	4	8
	≥20	2	1	3
Total		75	75	150

Based on duration of each episode of headache in study subjects, the mean duration of primary headache was 11.21±7.58 hours, whereas in secondary headache it was 11.45±7.56 hours, on applying T- test it was non-significant with p value of 0.85. The details are placed in table 5.

Table 5: Distribution of study subjects as per duration of each episode of headache

Type of headache	Mean	N	Std. Deviation	Min	Max
Primary	11.21	75	7.581	2	30
Secondary	11.45	75	7.566	2	30
Total	11.33	150	7.549	2	30
T test applied, t value- 0.19, p value- 0.85, non-significant					

Based on precipitating factors, this study showed out of 75 primary group subjects, 30 subjects had bright light, 23 had lack of sleep, 13 had alcohol and 9 had stress as precipitating factors. On applying chi-square it was non-significant with p value 0.99. The details are placed in table 6.

Table 6: Distribution of study subjects as per precipitating factor

		Type of headache		Total
		Primary	Secondary	
Precipitating factors	Alcohol	13	12	25
	Bright light	30	30	60
	Lack of sleep	23	24	47
	Stress	9	9	18
Total		75	75	150
Chi-square value- 0.061, p value- 0.99, non-significant				

Based on associated symptoms, this study showed, in primary headache group out of 75 study subjects 42 were without any associated symptoms, 16 had nausea, 15 had photophobia and rest 2 study subjects had vomiting. In secondary group out of 75 study subjects 43 subjects were without any associated symptoms, 16 each had nausea and photophobia, on applying chi-square it was non-significant with p value 0.56. The details are placed in table 7 .

Table 7: Distribution of study subjects as per associated symptoms

		Type of headache		Total
		Primary	Secondary	
Associated symptoms	No associated symptoms	42	43	85
	Nausea	16	16	32
	Photophobia	15	16	31
	Vomiting	2	0	2
Total		75	75	150
Chi-square value- 2.04, p value- 0.56, non-significant				

In our study groups based on CT scan findings, in primary headache group all 75 subjects had normal CT findings whereas in secondary headache group, ICSOL was the most common finding. The details are placed in table 8.

Table 8: Distribution of study subjects as per CT scan findings

		Type of headache		Total
		Primary	Secondary	
CT Scan findings	Normal findings	75	50	125
	Glioma / ICSOL	0	12	12
	Chronic meningitis	0	5	5
	SAH/SDH	0	8	8
Total		75	75	150
Chi-square value- 0.18, p value- 0.91, non-significant				

In this study based on abnormal neurological findings on examination, in primary headache no subjects had any abnormal deficits, whereas in secondary headache group patients had abnormal findings. The details are placed in table 9.

Table 9: Distribution of study subjects as per abnormal neurological findings

Abnormal neurological findings	Primary headache	Secondary headache	Total
Unconsciousness	0	3	3
Disoriented	0	3	3
Abnormal speech	0	5	5
Abnormal memory	0	2	2
Cranial nerve abnormality	0	15	15
Absent deep tendon reflex	0	10	10
Abnormal tone of the muscle	0	7	7
Abnormal power of muscle	0	10	10
Abnormal superficial reflex	0	07	07
Involuntary movement	0	05	05
Positive cerebellar sign	0	06	06
Meningeal sign	0	06	06

Most common primary headache were migraine which includes chronic migraine, migraine with aura, migraine without aura. Next most common type of primary headache was tension type headache. The details are placed in table 10.

Table 10: Distribution of study subjects as per final diagnosis of primary headache

Headache		No
Migraine	Chronic Migraine	12
	Migraine without aura	4
	Migraine With Aura	11
	Migraine with brain stem aura	2
	Benign paroxysmal vertigo	5
	Probable migraine without aura	3
Tension type headache	Episodic tension type headache	7
	Chronic tension type headache	6
	Persistent post-traumatic headache	5
Trigeminal autonomic cephalgias	Chronic cluster headache	4
	Episodic cluster headache	5
	Episodic paroxysmal hemicranias	4
	Chronic paroxysmal hemicranias	4
Other primary headache	Primary cough headache	3

DISCUSSION

In this study as per age, majority (47.33%) subjects were in the range 21-30 yrs, 21.33% subjects were in the range 31-40 yrs, 15.33% subjects were in the range ≤ 20 yrs and whereas only 3.33% study subjects were in the range of 61-70., these findings demonstrate that patients seeking medical attention for headache tend to be younger than the average age of community patients. This is in contrast to a study by **Yunfeng Wang et al** (22**)** showed that primary headache was most commonly encountered in patients aged 35–44 years. However, a study by **Soumyadarshan nayak et al**(5) had similar findings with the most common age group of the headache being 21-30 years followed by 31-40 years of age group and the least common was from the age group above 60 years.

In this study subjects as per gender, there is female predominance in both primary (70.67%) and secondary (73.33%) headaches. This is in accordance with studies by **Rizzoli et al.**(7) and **Magnavita et al.**(23)

Our study revealed:

- In both the primary headache and secondary headache group majority of the study subjects had duration of headache less than 1 year and with a frequency of less than 5 per month.
- The mean duration of each episode of headache primary was 11.21±7.58 hours, whereas in secondary headache it was 11.45±7.56 hours, without significant difference and throbbing type was more common in both followed by pricking and aching type.
- Most common precipitating factors were bright light followed by lack of sleep, alcohol and stress. And relieving factor was dark and quiet surroundings followed by full sleep.
- Most common associated symptoms in both the study groups was nausea and photophobia, the difference between two group was not significant.
- Most common neuroimaging findings was glioma/ICSOL, stroke followed by chronic meningitis on CT scan.
- Majority of study subjects in both the study group were on propranolol plus amitriptyline followed by propranolol alone and some were on flunarazine.
- Primary headache group no subjects had any abnormal neurological manifestations on evaluation. Whereas in secondary headache group 03 subjects each had disorientation and unconsciousness, 05 subjects each had abnormal speech, 15 subjects have cranial nerve abnormality, 10 subjects with abnormal motor findings, 05 subjects had involuntary movements and 06 subjects had positive cerebellar signs.
- Most common primary headache were migraine which includes chronic migraine, migraine with aura, migraine without aura. Next most common type of primary headache was tension type headache which includes 7 study subjects with episodic tension type headache, chronic tension type headache, 6 subjects had chronic tension type headache, 5 subject had episodic cluster headache.

CONCLUSION

In our study population, migraine was the most common etiology of headache, followed by TTH.. Most common precipitating factors were bright light followed by lack of sleep, alcohol and stress in both the study group. Identification of secondary headaches is important and warrants active management. Detailed clinical history is necessary for the patients presenting with headache as their primary complaints and timely radiological investigations are necessary for diagnosis of the etiology of the headache. Severity of disability in primary headaches, especially migraine, can be prevented by proper prophylaxis and avoidance of certain common precipitating factors.

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