

## Original Research Article

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# Do you really have sinus headache?

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### ABSTRACT

**Background:** Headache is a common symptom. Correct diagnosis of the etiology is the key to successful treatment. Chronic headache are misdiagnosed as sinus headache because of presence of overlapping symptoms leading to unnecessary treatment with no relief to the patient. We decided to undertake this study with the objective of evaluating patients with chronic headache for presence of chronic rhinosinusitis and hence assess the contribution of sinus headache to chronic headache.

**Methods:** The present study was conducted at Adichunchanagiri Institute of Medical Sciences, BG Nagara during the period January 2018 to December 2018. Patients presenting to OPD with chronic headache previously diagnosed as sinus headache were included in the study. A total of 174 patients were studied. All patients underwent detailed history taking, detailed ENT examination, and diagnostic nasal endoscopy. AAOHNS criteria for rhinosinusitis and IHS criteria for migraine and tension type headache were used for diagnosis.

**Results:** We found that only 13% (n=23) cases had chronic rhinosinusitis and hence diagnosed as sinus headache. 53% (n=92) had migraine, 31% (n=54) had tension type headache and 3% (n=5) could not be categorized.

**Conclusions:** Prevalence of sinus headache in our study was found to be 13%. There are high chances of misdiagnosing chronic headache as sinus headache because primary forms of headache can present with nasal symptoms. The AAOHNS criteria for rhinosinusitis and IHS criteria for migraine and tension type headaches are very useful and effective in making an accurate diagnosis.

**Keywords:** Chronic headache, Sinus headache, Migraine, Tension type headache

### INTRODUCTION

Lifetime prevalence of headache is 90 percent.<sup>1</sup> Almost all of us have suffered from headaches. Headaches can be quite annoying to the suffering patient as well as to the treating doctor. The key to successful treatment lies in accurate diagnosis.

The ear, nose and throat (ENT) specialist is frequently consulted when a headache is caused by an ENT primary disorder. Sometimes patients are referred to the ENT specialist by their general practitioner, but often it is the patient himself who contacts the specialist, presuming there is some ENT disorder that is causing his headache.

People often assume sinusitis is the most common cause of headache even though they do not have any specific symptoms apart from headache. These patients can be easily misdiagnosed as sinus headache and receive unnecessary treatment for sinus headache with no relief. Many of these patients suffer from primary forms of headache such as tension type headache or migraine. The vast majority of people who present with a symmetrical frontal or temporal headache, sometimes with an occipital component, have tension-type headache. Unilateral, episodic headaches are often vascular in origin.<sup>2</sup>

The idea that sinusitis can trigger migraine is misplaced, as the whole symptom complex is vascular and coexisting

nasal congestion is due to vasodilation of the nasal mucosa that is sometimes part of the vascular event. The use of nasal endoscopy and imaging of the paranasal sinuses have advanced our appreciation that these patients are suffering from a vascular event

ENT literature tends to give more importance to secondary headaches, whereas the revised International Headache Society (IHS) classification (2004) starts with primary forms.<sup>3,4</sup>

Headaches resulting from disease of the nose or paranasal sinuses are usually associated with symptoms (congestion, fullness, discharge, obstruction) that point to the site of origin. Occasionally, however, nasal or sinus disease can be manifested solely as headache. In such circumstance, diagnostic nasal endoscopy may demonstrate an abnormality or disease of the nose or paranasal sinus.

The present study was undertaken to evaluate patients with chronic headache for presence of chronic sinusitis and to assess the contribution of sinus headache to chronic headache.

## METHODS

The present study was conducted in the Department of Otorhinolaryngology, Adichunchanagiri Institute of Medical Sciences, B G Nagara during the period January 2018 to December 2018.

### Inclusion criteria

Inclusion criteria were patients with history of headache for at least 12 weeks and previously diagnosed as sinus headache; study includes patients in the age group of 20 - 60 years.

### Exclusion criteria

Exclusion criteria were patients with severe headache suggestive of intracranial disease; patient not consenting to participate in the study.

### Method of collection of data

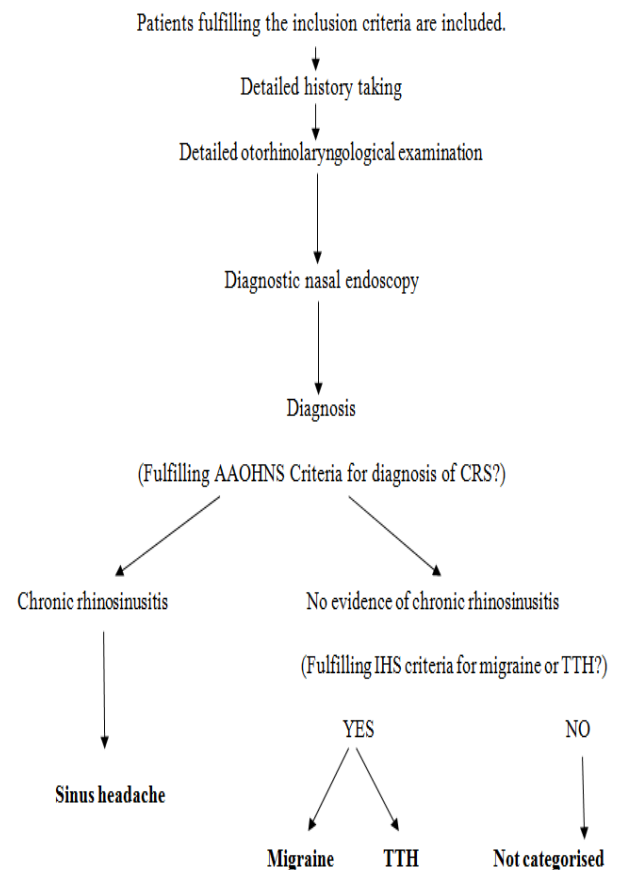
- The patients selected for the study were subjected to detailed history and evaluation.
- Detailed ENT examination was done.
- The patients underwent a diagnostic nasal endoscopy using the standard 3 pass technique.
- American Academy of Otolaryngology and Head and Neck Surgery criteria were used to diagnose chronic rhinosinusitis (sinus headache) (Table 1).
- In patients without chronic rhinosinusitis, International Headache Society Criteria for migraine and tension type headache (Table 2 and 3) were applied and they were diagnosed as either migraine or tension type headache.

- All diagnosed patients received appropriate therapy and response to therapy was noted.

**Table 1: Factors associated with diagnosis of rhinosinusitis according to American academy of otolaryngology – head and neck surgery criteria.<sup>5</sup>**

| Major factors                                  | Minor factors         |
|------------------------------------------------|-----------------------|
| Purulence in nasal cavity                      | Headache              |
| Facial pain, pressure, congestion and fullness | Fever (all nonacute)  |
| Nasal obstruction, blockage and discharge      | Halitosis             |
| Fever (acute rhinosinusitis only)              | Fatigue               |
| Hyposmia and anosmia                           | Dental pain           |
|                                                | Cough                 |
|                                                | Ear pain and fullness |

Note: 2 major factors or 1 major factor and two minor factors or nasal purulence on examination are diagnostic of rhinosinusitis.



**Figure 1: Study design.**

Data was entered into MS Excel 2016 and analysed using SPSS version 20.0. Data was expressed in mean and proportion. To test the significance between categorical variables, Chi square test was applied. P value less than 0.05 was considered statistically significant.

**Table 2: Diagnostic criteria for episodic tension type headache.<sup>4</sup>**

| Category | Criterion                                                                                                                                                                                                                                                                                |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A        | At least 10 episodes occurring >1 but <15 days per month for at least 3 months and fulfilling criteria B – D                                                                                                                                                                             |
| B        | Headache lasting from 30 minutes to 7 days                                                                                                                                                                                                                                               |
| C        | Headache has at least two of the following characteristics <ul style="list-style-type: none"> <li>• Bilateral location</li> <li>• Non pulsating quality</li> <li>• Mild or moderate</li> <li>• Not aggravated by routine physical activity such as walking or climbing stairs</li> </ul> |
| D        | Both of the following <ul style="list-style-type: none"> <li>• No nausea or vomiting</li> <li>• No more than one of photophobia or phonophobia</li> </ul>                                                                                                                                |
| E        | Not attributed to another disorder                                                                                                                                                                                                                                                       |

**Table 3: International headache society diagnostic criteria for migraine without aura.<sup>4</sup>**

| Category | Criterion                                                                                                                                                                                                                                                                                                              |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A        | At least 5 attacks fulfilling criteria B-D                                                                                                                                                                                                                                                                             |
| B        | Headache attacks lasting 4-72 h (untreated or treated successfully)                                                                                                                                                                                                                                                    |
| C        | Headache has atleast 2 of the following characteristics <ul style="list-style-type: none"> <li>• Unilateral location</li> <li>• Pulsating quality</li> <li>• Moderate or severe pain intensity</li> <li>• Aggravation by or causing avoidance of routine physical activity (eg. walking or climbing stairs)</li> </ul> |
| D        | During headache atleast 1 of the following <ul style="list-style-type: none"> <li>• Nausea and/or vomiting</li> <li>• Photophobia and phonophobia</li> </ul>                                                                                                                                                           |
| E        | Not attributed to another disorder                                                                                                                                                                                                                                                                                     |

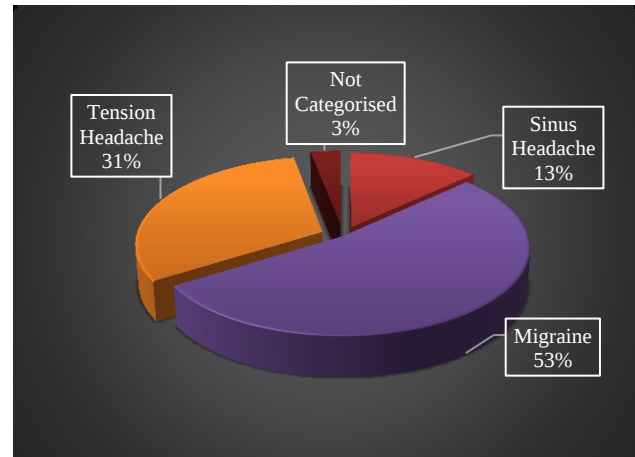
**Table 6: Distribution of study participants based on age and diagnosis.**

| Diagnosis             | 20–29 years<br>N (%) | 30–39 years<br>N (%) | 40–49 years<br>N (%) | 50–60 years<br>N (%) |
|-----------------------|----------------------|----------------------|----------------------|----------------------|
| Sinus headache        | 9 (15.8)             | 7 (15.2)             | 4 (11.8)             | 3 (8.1)              |
| Migraine              | 30 (52.6)            | 24 (52.7)            | 18 (52.9)            | 20 (54.1)            |
| Tension type headache | 17 (29.8)            | 14 (30.4)            | 10 (29.4)            | 13 (35.1)            |
| Not categorised       | 1 (1.8)              | 1 (2.1)              | 2 (5.9)              | 1 (2.7)              |
| Total                 | 57 (100.0)           | 46 (100.0)           | 34 (100.0)           | 37 (100.0)           |

We had the maximum number of patients in the age group of 20-29 years followed by the age group 30-39 years. The mean age was 35 years with SD±11.40.

## RESULTS

In the present study a total of 174 patients were included among whom 13% (n=23) were diagnosed to have sinus headache, 53% (n=92) migraine and 31% (n=54) tension type headache, whereas 3% (n=5) could not be categorized.

**Figure 2: Prevalence of various types of headache.****Table 4: Distribution of study participants according to age.**

| Age group (years) | Number | Percentage (%) |
|-------------------|--------|----------------|
| 20-29             | 57     | 32.8           |
| 30-39             | 46     | 26.4           |
| 40-49             | 34     | 19.5           |
| 50-60             | 37     | 21.3           |
| Total             | 174    | 100.0          |

**Table 5: Mean and standard deviation of study participants.**

|     | Mean | Standard deviation |
|-----|------|--------------------|
| Age | 35   | ±11.40             |

In the present study, majority of patients were in age group of 20-29 years (n=57) followed by 30-39 years (n=46), 50-60 years (n=37) and 40-49 years (n=34).

Of the 23 patients with sinus headache, 9 were in the age group 20-29 years followed by 7 in 30-39 years, 4 in 40-49 years and 3 in 50-60 years age group.

The study included 66 male and 108 female patients. Of the 66 males, 4 were diagnosed to have sinus headache, 42 migraine and 19 tension type headache and 1 could not be categorised. Of the 108 females, 19 were found to have sinus headache, 50 migraine, 35 tension type headache and 4 could not be categorised. The prevalence sinus headache and tension type headache was higher in females.

**Table 7: Distribution of study participants according to sex**

| Sex            | Number | Percentage (%) |
|----------------|--------|----------------|
| <b>Males</b>   | 66     | 37.9           |
| <b>Females</b> | 108    | 62.1           |
| <b>Total</b>   | 174    | 100.0          |

In our study we found that out of 23 patients with sinus headache, majority presented with facial pain (21) and nasal obstruction (21) followed by facial congestion (20), nasal discharge (20), halitosis (12), hyposmia/anosmia (8), fatigue (4) and dental pain (4).

**Table 8: Distribution of study participants based on sex and diagnosis.**

| Diagnosis                    | Males N (%) | Females N (%) |
|------------------------------|-------------|---------------|
| <b>Sinus headache</b>        | 4 (6.1)     | 19 (17.6)     |
| <b>Migraine</b>              | 42 (63.7)   | 50 (46.3)     |
| <b>Tension type headache</b> | 19 (28.7)   | 35 (32.4)     |
| <b>Not categorised</b>       | 1 (1.5)     | 4 (3.7)       |
| <b>Total</b>                 | 66 (100.0)  | 108 (100.0)   |

Chi square =7.3068; p value=0.062736.

**Table 9: Associated symptoms of various types of headache.**

| Symptoms                 | Sinus headache | Migraine | Tension type headache | Total |
|--------------------------|----------------|----------|-----------------------|-------|
| <b>Facial pain</b>       | 21             | 30       | 11                    | 62    |
| <b>Facial congestion</b> | 20             | 4        | 8                     | 32    |
| <b>Nasal obstruction</b> | 21             | 28       | 4                     | 53    |
| <b>Nasal discharge</b>   | 18             | 0        | 12                    | 30    |
| <b>Hyposmia/anosmia</b>  | 8              | 0        | 0                     | 8     |
| <b>Halitosis</b>         | 12             | 0        | 0                     | 12    |
| <b>Fatigue</b>           | 4              | 22       | 12                    | 38    |
| <b>Dental pain</b>       | 3              | 10       | 7                     | 20    |
| <b>Ear pain</b>          | 0              | 0        | 16                    | 16    |

## DISCUSSION

Headache is a very common symptom but correct diagnosis of the etiology is quite challenging. Correct diagnosis is the key to successful treatment and relief from this annoying symptom. In this study we have made an attempt to evaluate chronic rhinosinusitis as a cause of chronic headaches.

In the present study we evaluated a total of 174 cases of chronic headache and we found that 23 cases had sinus headache, 92 had migraine, 54 had tension type headache and 5 cases could not be categorised.

In our study the prevalence of sinus headache was only 13 percent. Migraine and tension type headache formed the majority of cases with 53% having migraine and 31% having tension type headache. 3% of cases could not be categorized. 84% of cases had been misdiagnosed as sinus headache. The prevalence sinus headache and

tension type headache was significantly higher in females. Out of 23 cases of sinus headache, 4 were males and 19 females. And out of 54 cases with tension type headache, 19 were males and 35 were females. It is note worthy that in 92 patients diagnosed with migraine, 28 had the symptom of nasal obstruction. And in 54 patients diagnosed with tension type headache, 12 had the symptom of nasal discharge. Facial pain was the most common symptom followed by nasal obstruction. This goes on to explain why these patients were misdiagnosed as sinus headache.

Numerous attempts have been made in the past to evaluate the prevalence of various types of headaches. Although the number of patients and percentage of headaches varies in different studies, uniformly sinus headache cases form the minority.

A case control study was done at Dr. Sami Ulus Children's Hospital, Ankara, Turkey between February 2001 and February 2004. The study included 214 patients

with complete data. Approximately 40% of the patients with migraine and 60% of the patients with tension type headache had been misdiagnosed as sinus headache and treated accordingly.<sup>6</sup>

A prevalence study was done by Curtis P. Schreiber et al in 2004. This study was conducted to determine the prevalence of migraine type headache in patients with a history of self described or physician diagnosed sinus headache. A total of 2991 patients were screened. 88% of the patients with a history of self described or physician-diagnosed "sinus" headache were determined to have migraine type headache. Patients experienced sinus pain, sinus pressure and nasal symptoms as features of migraine. Patients were significantly impacted by their "sinus" headache and they were dissatisfied with their prestudy headache medications, none of which was a migraine therapy. The results indicate that the presence of nasal or ocular symptoms often considered to be features of "sinus" headache should not automatically trigger a sinus diagnosis or exclude a diagnosis of migraine but should prompt assessment of the patient for migraine as well as sinus headache.<sup>7</sup>

In our study among 92 patients diagnosed with migraine, 28 had the symptom of nasal obstruction. And in 54 patients diagnosed with tension type headache, 12 had the symptom of nasal discharge.

A clinical study of 200 patients complaining of headache reporting either in ENT- OPD or admitted in ENT wards of J N Medical College, AMU, Aligarh was undertaken from Jan1994 to Oct 1996. This study found that the prevalence of headache due to sinus disease was 23%, headache due to migraine and other non-sinus causes was 69%, psychogenic headache was 8%. Headaches can be of sinogenic origin even if this cause may not be suspected from the case history. Recurrences are common in patient of headaches of multiple etiology, and more if not treated specifically.<sup>8</sup>

A study was conducted at Akershus University hospital, Norway in 2008 in which 30000 persons were studied for association chronic headache and chronic rhinosinusitis. The criteria of American Academy of Otolaryngology-Head and Neck Surgery were applied to diagnose headache attributed to chronic rhinosinusitis(HARCS). Compared to general population, persons with chronic rhinosinusitis have an atleast nine fold increased risk of having chronic headache. A 3 year follow up showed that HARCS symptoms were significantly improved after treatment with nasal surgery nasal corticosteroids, discontinuation of overused headache medications and nasal decongestants.<sup>9</sup>

Eross et al in their The Sinus, Allergy and Migraine Study (SAMS) in 2007 found that out of 100 patients with self diagnosed headaches, 52 percent had migraine, only 3 percent had sinus headache and 9 percent of cases were non classifiable. In this study they used the

International Headache Society Criteria and concluded that majority of self diagnosed sinus headaches have migraine and the most common reasons for misdiagnosis include headache triggers, pain location, and associated features.<sup>10</sup>

In a population-based headache study of 23,564 subjects, 4967 individuals called their headache migraine and 3074 individuals had headache that met IHS migraine criteria. Among those with IHS migraine, only 53.4% recognized their headaches as migraine; stress headaches (n=345) and sinus headaches (n=365) were the most common erroneous labels reported. People are confused by their headache location. Because the sinuses are close to the eyes, individuals may attribute headaches located in the frontal, supraorbital, or infraorbital region to the sinuses.<sup>11</sup>

In a clinic-based study, headache symptoms, headache-associated disability, and response to therapy among patients who had self-described sinus headache were assessed. Patients had to have self-described sinus headaches and at least one migraine symptom: moderate to severe pain, nausea or vomiting, photophobia or phonophobia, unilateral pain, pain worsening with activity, or pulsating pain. They were excluded if they had a previous migraine diagnosis or exposure to triptans, headaches associated with fever or purulent nasal discharge, or radiographic evidence of a sinus infection.<sup>12</sup>

A selected group of patients who had self-described sinus headache had IHS migraine (70%) or migrainous (28%) headache. Most had nasal symptoms, including stuffiness (74%) and runny nose, and 45% said their headaches were precipitated by changes in the weather. Thus, patients who believe they have sinus headache, have no signs or symptoms of rhinosinusitis, and have one symptom of migraine, have migraine.<sup>13</sup>

Findings of our study emphasize the need for proper evaluation of patients to avoid misdiagnosis and unnecessary treatment.

## CONCLUSION

We conclude that although many patients with chronic headache have associated symptoms suggestive of sinus headache, it is infact a less common cause of headache. The prevalence of sinus headache in our study was found to be 13%. There are high chances of misdiagnosing chronic headache as sinus headache because primary forms of headache can present with nasal symptoms. Even in the presence of symptoms suggestive of sinus disease, the treating physician should look at the more prevalent causes like migraine and tension type headache. The AAOHNS criteria for rhinosinusitis and IHS criteria for migraine and tension type headaches are very useful and effective in making an accurate diagnosis. Diagnostic nasal endoscopy is very helpful in diagnosing chronic

rhinosinusitis. We recognize the need for a larger population based study.

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