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*Original Research Article.*

# To Determine the Role of CT Scan in the Etiology of Headache at a Tertiary Care Hospital

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## ABSTRACT

**Background:** Headache is the most common complain of most of the patients presenting to Medicine and Neurological department. It may lead to derangement of the normal day-to-day activity. The present study was conducted to determine the etiology of headache in patients undergoing computed tomography (CT) scan of brain in a tertiary care hospital.

**Materials and Methods:** The present study was descriptive prospective study carried out at Department of Radio Diagnosis, Rama Medical College Hospital & Research Centre, Pilkhuwa, Hapur, Uttar Pradesh, India. It includes all patients who underwent a head CT scan for headache. A total of 260 patient CT head scans for headache were included. The findings were tabulated and analyzed using Statistical Package for the Social Sciences, Version 21.0 (SPSS, Chicago, IL).

**Results:** The total number of patients was 260 with the predominance of men (57.69%) against 42.30% of women. In 51.15% of cases CT findings were normal. CT revealed in 48.85% of cases suffer from headache. These causes were dominated by stroke (14.23%), followed by trauma (10.76%), sinusitis (8.07%), abscesses (4.61%) and encephalitis (3.84%) and tumor (7.3%).

**Conclusion:** The study concluded that 51.15% of cases CT findings were normal. CT revealed in 48.85% of cases suffers from headache with various causes in rest of cases.

**Keywords:** CT Scan, Headache, Stroke, Encephalitis.

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## INTRODUCTION

Chronic headache is defined as "headache occurring for 15 or more days in a month for at least three months."[1] It is one of the common complaints encountered in day-to-day neurological practice. The global burden of headache, a prevalence of 50% has been reported in Asia, Australia, Europe, and North America.[2] A classification system developed by the International Headache Society characterizes headache as primary or secondary. Primary headaches are those in which headache and its associated features are the disorder in itself, whereas secondary headaches are those caused by exogenous disorders.[3]CT image is cross sectional representation of anatomy created by a computer-generated analysis of the attenuation of X ray beams passed through section of body. A computer calculates "back projection" image from 360-degree x ray attenuation profile. CT evaluates anatomy of brain structures reasonably well. There have been numerous epidemiological studies of epilepsy in the general population in India, the first study conducted in 1968. Subsequently a large number of community-based prevalence studies have been carried out, based on the world health organization (WHO) protocol.[4] Neuroimaging is useful in case of recent onset headache and headache with progressive worsening or with change in headache pattern or associated with epilepsy, change in personality or with history of trauma. It is also helpful in presence of red flag signs (changes in headache pattern, new onset headache in people above 50 years of age, associated with systemic illness or personality change, raised intracranial pressure, early morning headache, or headache worsening with coughing, sneezing or straining).[5] The present study was conducted to determine the etiology of headache in patients undergoing computed tomography (CT) scan of brain in a tertiary care hospital.

## MATERIALS AND METHODS

The present study was descriptive prospective study carried out at Department of Radio Diagnosis, Rama Medical College Hospital & Research Centre, Pilkhuwa, Hapur, Uttar Pradesh, India. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute. It includes all patients who

underwent a head CT scan for headache. A total of 260 patient CT head scans for headache were included. All patients underwent helical acquisition without contrast medium injection. According to the context (notion of fever or combined hormonal taking or suspect image on the spontaneous contrast acquisition), another complementary acquisition was performed after iodinated contrast medium IV injection. Clinical history was obtained through the interview of patients. The findings were tabulated and analyzed using Statistical Package for the Social Sciences, Version 21.0 (SPSS, Chicago, IL).

**Table 1: Prevalence of headache according to gender**

| Gender | N(%) |
|---|---|
| **Male** | 150(57.69%) |
| **Female** | 110(42.30%) |
| **Total** | 260(100%) |

**Table 2: CT findings of patients**

| CT findings | N(%) |
|---|---|
| **Trauma** | 28(10.76%) |
| **Tumor** | 19(7.3%) |
| **Stroke** | 37(14.23%) |
| **Sinusitis** | 21(8.07%) |
| **Encephalitis** | 10(3.84%) |
| **Abscess** | 12(4.61%) |
| **Normal** | 133(51.15%) |
| **Total** | 260(100%) |

## RESULTS

The total number of patients was 260 with the predominance of men (57.69%) against 42.30% of women. In 51.15% of cases CT findings were normal. CT revealed in 48.85% of cases suffers from headache. These causes were dominated by stroke (14.23%), followed by trauma (10.76%), sinusitis (8.07%), abscesses (4.61%) and encephalitis (3.84%) and tumor (7.3%).

## DISCUSSION

The incidence and prevalence of headache in the Indian subcontinent have not been adequately researched. Recently, a population-based survey on the prevalence of headache in the state of Karnataka has shown that tension-type headache and migraine are the two most common causes of headache.[6] Apart from these common causes, there are multiple other causes such as trauma, vascular disorders, infections, tumors, substance abuse, etc. Some forms of headache like ophthalmoplegic migraine have a typical clinical presentation and imaging may or may not be informative.[7]

The total number of patients was 260 with the predominance of men (57.69%) against 42.30% of women. In 51.15% of cases CT findings were normal. CT revealed in 48.85% of cases suffers from headache. These causes were dominated by stroke (14.23%), followed by trauma (10.76%), sinusitis (8.07%), abscesses (4.61%) and encephalitis (3.84%) and tumor (7.3%).

In a retrospective study of 100 records of patients admitted to a medical emergency department in the United States, 74% of patients were women.[8] In the study of Subeede women were most affected by headache with a prevalence between 16-88% for women and 9-69% for men.[9]

In 1993, Mitchell et al. evaluated whether routine CT evaluation is necessary in patients of headache irrespective of presence or absence of neurological findings.[5]

They studied 350 patients of which only 2% had CT findings which were clinically significant. They found that an additional 7% of the patients had positive CT findings that were clinically insignificant. More importantly, all of the patients in their study who had significant CT findings had some neurological finding or abnormal symptom.[10]

In a study carried out by Detsky in a Danish population, infectious headache accounted for 63% of secondary headache and was the most common. ENT headache accounted for 15%; Traumatic headache 4%; cluster headache 1% and finally non-vascular headache 0.5%.[11]

Recently, a study by Simpson et al. found CT positivity of 10.5% in 4404 CT scans referred by general physicians between 1999 and 2007.Out of this, 1.4% of the CT findings were thought of as having abnormalities which could potentially be attributed as a cause of headache and 9.1% of the abnormalities were thought to be incidental in nature.[12]

In a study published by Prpić et al. on neuroimaging done in children with chronic headache out of 215 children CT/MRI was done in 164 patients and majority of them ($n$ = 117, 71.3%) had normal neuroimaging.[13]

## CONCLUSION

The study concluded that 51.15% of cases CT findings were normal. CT revealed in 48.85% of cases suffers from headache with various causes in rest of cases.

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