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Original Research Article

Prevalence, Clinical Presentation and Aetiology of Secondary Headache from a Tertiary Care Centre in Western Tamil Nadu

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ABSTRACT

Background: Very little information is available about the incidence and varieties of secondary headache in India. We looked into the incidence and types of secondary headache among those who present with acute severe headache in a tertiary hospital in Western Tamilnadu.
Methods: We included all patients who presented in the neurology department between January 2017 and January 2019 with acute severe headache. We followed a clinical evaluation protocol, at the end of which all primary headaches were excluded and the various types of secondary headaches were included in the study.
Results: There were 650 patients who presented with acute severe headache during the study period, out of which 150 were found to be due to secondary causes (23%). The clinical pattern was one of thunderclap headache, headache with fever, headache with focal neurological deficit or new daily persistent headache. New daily persistent headache was the commonest clinical presentation (48%) and cerebral venous thrombosis (22.6%) the commonest etiology. The other frequent causes of secondary headache were subarachnoid hemorrhage (17.3%), meningitis (17.3%) and rhinosinusitis (10.7%).
Conclusion: Secondary headache constituted 23% of our patients presenting with acute severe headache. New daily persistent headache was the commonest clinical pattern of secondary headache and cerebral venous thrombosis the commonest cause.
Key words: secondary headache, thunderclap headache, new daily persistent headache, rhinosinusitis, cerebral venous thrombosis, sub-arachnoid hemorrhage

INTRODUCTION

Headache is one of the most common symptoms encountered in general clinical practice. Headache disorders are divided into primary and secondary headache syndromes. In the former, the headache and associated features constitute the disorder itself whereas in the latter, the headache results from exogenous etiologies. Most of the cases of severe headache are benign. However it is essential to recognize the secondary headaches early since some of them can be potentially life-threatening. The etiology of secondary headache can vary in various geographical locations. In the present study we looked into the various causes of secondary headache syndromes which presented to us in a tertiary care centre in South India.

MATERIALS AND METHODS

All patients who presented to us in the neurology department between January 2017 and January 2019 with acute severe headache were evaluated after getting verbal consent. Patients less than 18 years of age

and pregnant women were excluded. We excluded all primary headaches at the end of the evaluation protocol detailed below and the secondary headaches were included in the study.

Evaluation protocol:

We first take a thorough history including the onset of headache, quality, location and irradiation of pain, associated symptoms, concomitant medical conditions, medication use, and recent trauma. Then clinical examination targeting the areas identified as abnormal during the headache history is carried out. This would include a complete neurological assessment including level of consciousness, fundoscopy, cranial nerve testing and looking for signs of meningeal irritation. [1] Patients with "red flags" for secondary headache disorders like sudden onset of headache, onset after 50 years of age, change in the usual headache pattern, increased frequency or severity, new onset of headache in those with an underlying medical condition, headache in patients with systemic illness, presence of focal neurologic signs or symptoms, papilledema, and head trauma are identified. [2] A detailed diagnostic workup is then carried out including blood tests, neuroimaging studies, and cerebrospinal fluid (CSF) examinations, based on the patient's history and clinical findings as detailed in Figure 1. [3,4] We found their clinical presentation fitting into one of the four groups; thunder clap headache, headache associated with fever, headache associated with focal neurological deficits and new daily persistent headache. Thunder clap headache (TCH) is severe headache of abrupt onset reaching its maximum intensity within 1 minute or less of onset. [5] New Daily Persistent Headache (NDPH) is characterized by an acute onset of headache followed by a daily, unremitting and continuous course lasting more than 3 months. [6] We included all the cases of secondary NDPH.

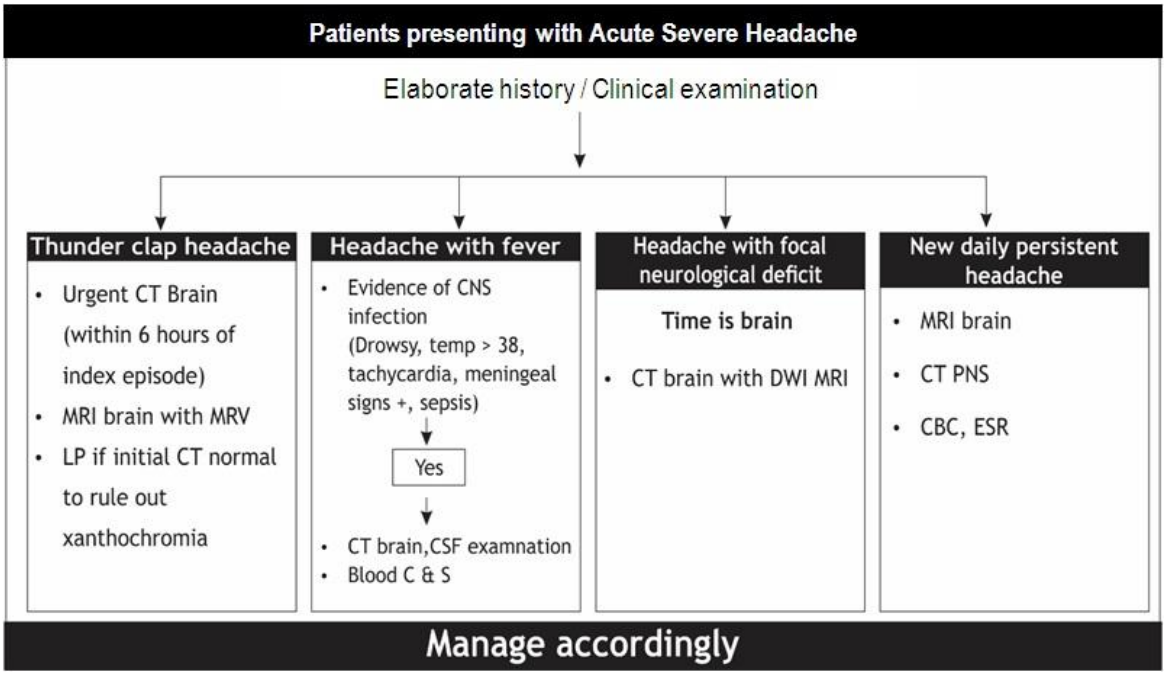

Figure 1. Investigations tailored to the clinical presentation of patients with headache

RESULTS

There were 650 patients who presented with acute severe headache during the study period, out of which 150 were found to be due to secondary causes (23%).This is detailed in Table 1. Majority of the patients (48%) presented with NDPH, in which headache was new in onset and persistent with waxing and waning quality in many.

Table 1 Causes of secondary headache (N=150)

Aetiology	Number (%)
Thunderclap headache	**31(20.7)**
Subarachnoid hemorrhage	26(17.3)
Vertebral artery dissection	1(0.7)
Carotid dissection	1(0.7)
Reversible cerebral vasoconstriction syndrome	3(2.0)
Headache with fever	**33(22.0)**
Meningitis	26(17.3)
Systemic illness	6(4.0)
HaNDL syndrome	1(0.7)
Headache with focal neurological signs	**14(9.3)**
Acute ischemic stroke	7(4.7)
Intracerebral hemorrhage	5(3.3)
Intracranial tumor	2(1.3)
New daily persistent headache	**72(48.0)**
Rhino-Sinusitis	16(10.7)
Idiopathic Intracranial hypertension	2(1.3)
Intracranial hypotension	1(0.7)
Cerebral venous thrombosis	34(22.6)
Pituitary apoplexy	1(0.7)
Post traumatic headache	3(2.0)
Drug induced headache	2(1.3)
Drug withdrawal headache	4(2.7)
Cervical spine disease	3(2.0)
Post-ictal headache	2(1.3)
Psychogenic headache	2(1.3)
Giant cell arteritis	1(0.7)
Hypertrophic pachymeningitis	1(0.7)

Cerebral venous thrombosis (22.6%) and rhinosinusitis (10.7%) were the common conditions presenting as NDPH. Some of the interesting cases of secondary headache are shown in Figure 2. The second common presentation of secondary headache was with fever (22%) contributed to predominantly by meningitis. Around 20% of patients presented with thunderclap headache associated with aneurysmal or non-aneurysmal subarachnoid hemorrhage. Headache associated with focal neurological deficits was seen in 9.3% of patients. This was seen in association with ischemic stroke, hemorrhagic stroke or intracranial space occupying lesion.

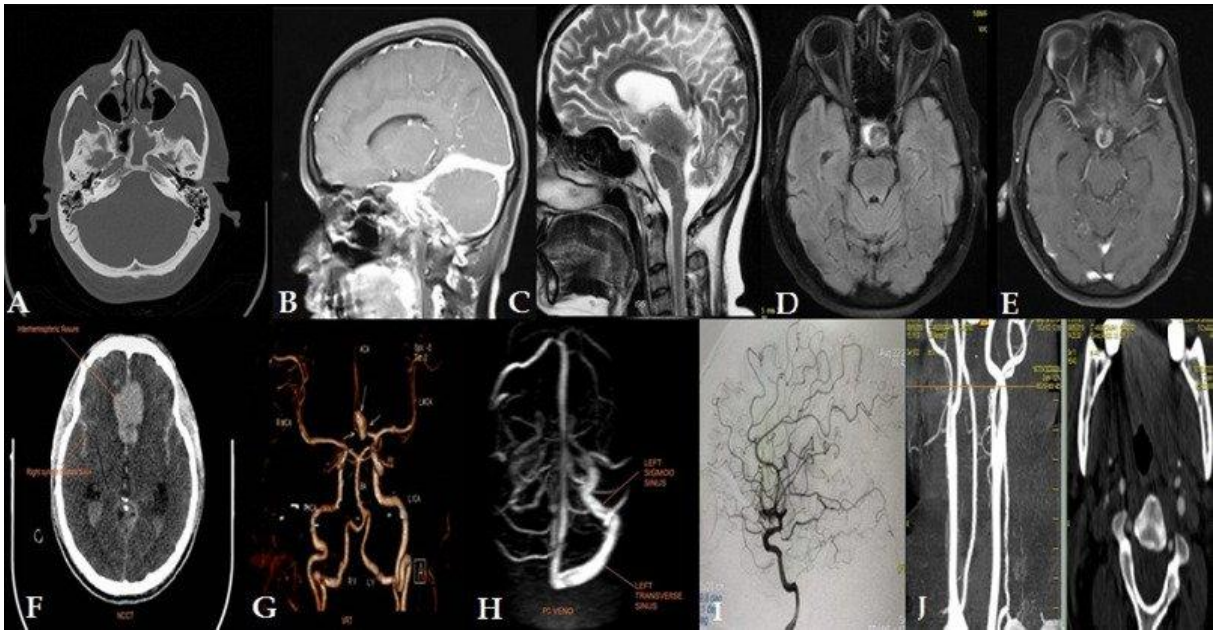

Figure 2: Some interesting imaging representations of secondary headache syndromes:
CT axial section shows left maxillary sinusitis(A), MRI Brain T1 weighted sagittal section, post contrast shows thickened and enhancing meninges in the tentorium suggesting hypertrophic pachymeningitis (B), MRI Brain T2 weighted sagittal section shows deep brain swelling in intracranial hypotension(C), MRI Brain axial FLAIR(D) and MRI Brain T1 weighted post contrast(E) showing hemorrhage into a pituitary adenoma presenting as apoplexy, CT Brain(F) and CT angiogram reconstructed image(G) showing anterior interhemispheric subarachnoid bleed associated with ACoM aneurysm, MR venogram showing right transverse sinus thrombosis(H), Cerebral Digital Subtraction Angiography showing multiple constriction of small vessels due to RCVS(I) and CT angiogram sagittal and axial images showing double lumen associated with right vertebral dissection(J).

DISCUSSION

There is very little information available about the incidence and types of secondary headache in the Indian population. The available data so far focuses predominantly on the various primary headache syndromes. [7] Our study is thus among the first few attempts in India to understand the various types of secondary headaches in the Tamil population of

Coimbatore, Western Tamil Nadu. Worldwide, secondary headache is found in around 20% of people with headache disorder. [8] Almost in line with that data we found that 23% of our patients presenting with acute severe headache harbored secondary causes. Studies conducted at tertiary treatment sites similar to our hospital have identified the presence of secondary headache varying from 12.9% to 20%. [9,10] Higher incidence can be expected in patients presenting in the emergency department with acute severe headache. There are 8 categories and 46 subcategories of potential secondary causes of headache in "The International Classification of Headache Disorders 3"(ICHD-3). [6] However our approach was directed towards the clinical presentations and all our patients could be classified as one among the four of thunderclap headache, headache with fever, headache with focal neurologic deficits and new daily persistent headache.

The commonest presentation of secondary headache in our population was NDPH. Some of the patients in our group of secondary NDPH had headache of varying intensity within the same day and the duration was less than three months. They thus may not exactly fit into the classical definition of NDPH which is more applicable to the primary variety. Cerebral venous thrombosis (CVT) was the most common cause. Though some of them had focal neurologic deficits we included them in NDPH since headache was the most prominent and the first symptom. It is interesting to note that around 50% of patients with CVT had a progressively increasing daily headache. Rhinosinusitis was the next common cause of secondary NDPH. They seem to mimic primary headache and a high index of suspicion is required for the diagnosis especially in situations of unresponsiveness to initial treatment. Of particular note is the interesting detection of sphenoid sinusitis in 3 patients who were resistant to treatment. Their headache responded only to endoscopic sinus surgery. The sphenoid sinus is called the neglected sinus. [11] The pathophysiology of headache in sphenoid sinusitis is similar to that of migraine since the sinus is also supplied by the ophthalmic and maxillary divisions of the trigeminal nerve. The cases of drug induced headache were due to amlodipine and isosorbide dinitrate and the ones causing withdrawal headache were nicotine and alcohol.

The next common cause of secondary headache was that associated with fever. Twenty six such presentations were due to either bacterial or viral meningitis or viral encephalitis and also included one case each of malaria and dengue. Altered sensorium was seen in six of them. Herpes simplex was the common offender in acute encephalitis. Among the systemic illnesses causing headache along with fever were pneumonia, urinary tract infection and a case of systemic lupus erythematosus with vasculitis. Another interesting clinical presentation was that of a nineteen year old female with history of migraine without aura who was admitted with fever and severe headache. She had subtle signs of meningeal irritation and right sided weakness. The only positive finding during investigations was lymphocytic pleocytosis in the cerebrospinal fluid. She recovered totally in 4-5 days. She probably fits into the syndrome of transient headache and neurological deficit with CSF lymphocytosis (HaNDL), which is a rare variant of migraine attributed to noninfectious inflammatory disease with associated hemiparesis**,** hemiplegia, meningeal irritation, dysphagia and rarely visual symptoms and aphasia. [12]

The thunderclap headache (TCH) is a high-intensity headache of abrupt onset, reaching maximum intensity in less than1minute. It is associated with serious intracranial disorders of vascular origin. Twenty six out of thirty one cases of TCH were due to subarachnoid hemorrhage. It was detected by CT scan in the majority of cases and by cerebrospinal fluid examination in three. Non aneurysmal perimesencephalic bleed was seen in two

whereas the rest demonstrated intracranial vascular aneurysms. The remaining five patients with TCH were associated with carotid and vertebral dissection and reversible cerebral vasoconstriction syndrome.

Lastly, the group of headache with focal neurological signs included 14 patients of which acute ischemic stroke accounted for seven, intraparenchymal hemorrhage five and space occupying lesions two. Five of the ischemic strokes were in the posterior circulation and two in the carotid territory. All of them were cortical strokes and none purely subcortical. Both the space occupying lesions were cerebral metastasis. Headache is known to occur in 16%-65% of patients with Transient Ischemic Attack and non-disabling stroke. [13] It is also known to occur more frequently in the posterior circulation than the anterior one (59% vs 29% in the study mentioned above). Patients with cortical stroke develop headache more frequently than those with subcortical stroke. Around 58% of intracranial hemorrhages also seem to present with headache. [14]

CONCLUSION

Secondary headache constitutes around 23 % of patients presenting with acute severe headache in our setup. The clinical pattern fits into one of thunderclap headache, headache with fever, headache with focal neurological deficit and new daily persistent headache. Secondary causes of new daily persistent headache are the most common among them. Cerebral venous thrombosis is the most common aetiology. Meningitis and subarachnoid hemorrhage are the other prominent causes of secondary headache. Rhinosinusitis is another interesting cause of secondary headache masquerading like primary headache and a high index of suspicion is required for its diagnosis and treatment.

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