Impact of Co-existing Vascular Headache on Symptom Relief After Endoscopic Sinus Surgery

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Abstract Vascular headache and chronic rhinosinusitis (CRS) are diseases that share similar symptoms and demographics, including headache, facial pain and nasal symptoms. Contribution of chronic sinusitis as a cause of chronic headache is controversial, as there are scarce studies to know incidence of vascular headache in patients with CRS. To evaluate incidence of vascular headache in patients with CRS. Using descriptive study design, group of 100 patients with symptoms of CRS with headache were included in study. Patients underwent surgical management and 3% managed medically. Patients were assessed for associated factors with headache and further evaluated for persistence of headache postoperatively. Inferential statistics was done by Chi square test using SPSS for Windows Software (Version 21.0). Leading symptoms of CRS were headache (100%), nasal obstruction (93%), and nasal discharge (90%). Pre-treatment 25% had exposure to sunlight as aggravating factor and associated nausea vomiting in 30%. Post-treatment, follow-up at 6 months, 20% reported persisting headache, with duration of headache >1 year in 37.5% ($p = 0.01$). Those with pre-operative sunlight exposure as aggravating factor, headache persisted in 60% ($p < 0.0001$) and those with nausea/vomiting pre-treatment; headache persisted in 56.7% ($p < 0.0001$). These results were statistically significant. In CRS patients who had other factors contributing to headache like duration of headache more than 1 year, associated nausea/vomiting, and aggravating factors like exposure to sunlight, headache persisted after medical and surgical treatment of CRS. It

signifies that 20% CRS patients with headache were having co existing vascular headache.

Keywords Chronic rhinosinusitis · Vascular headache · Chronic headache

Introduction

Headache is the most frequent of all painful states that afflict humans and accounts for nearly 20% of complaints as evaluated by family physician [1]. A patient with headache and facial pain presents with a diagnostic challenge. Rhinitis, rhinosinusitis, and migraines affect common locations; have overlapping symptoms (nasal congestion, rhinorrhea, facial pressure–pain–fullness, headache) and precipitating triggers (weather changes, inhaled irritants, allergies) creating diagnostic challenges [2]. American Academy of Otolaryngology–Head & Neck Surgery (AAO-HNS) criteria for diagnosis of sinusitis mandates objective confirmation by either nasal endoscopy (NE) or computed tomography (CT) [3]. Persistence of headache in patients with chronic rhinosinusitis (CRS) despite surgical and medical management, needs consideration of vascular headache as a co-existing pathology.

Methods

A descriptive study of sinus diseases was conducted on 100 patients at Department of ENT JSS Medical College and Hospital, Mysore from Nov 2013 to June 2015. Data was collected from patients who had symptoms of headache. Inclusion criteria had patients presenting with chronic headache for at least 12 weeks, in age group of

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15–55 years, who gave informed consent for the study. Patients already diagnosed with migraine were excluded. Detailed history about duration, frequency and site of headache, diurnal variation, aggravating/relieving factors and associated symptoms of nausea/vomiting, photophobia, facial pain, facial congestion/fullness, nasal obstruction/blockage, nasal discharge, post nasal discharge, hyposmia/anosmia, halitosis, fatigue, dental pain, cough and ear pain/fullness and disturbances of vision with detailed otolaryngologic examination was undertaken. X ray or CT PNS was taken for radiological evidence of chronic sinusitis. Diagnostic nasal endoscopy was undertaken in all patients. Patients were treated either medically or surgically.

Statistical Analysis

100 cases were selected by purposive sampling method. The analysis was done by measuring mean, median and standard deviation. Inferential statistics was done by Chi square test using SPSS for Windows Software (Version 21.0).

Results

The majority of study subjects were between 21 and 30 year age group (34, 34%). The mean age was 31.6 ± 12.2 years, with minimum of 15 year and maximum of 64 years. The majority of study subjects were male (65, 65%) and 35, 35% were females. 76 (76%) of study subjects had duration of headache <1 year and few had symptoms >1 year (24, 24%). The mean duration of headache was 13.2 ± 9.37 months, with minimum of 4 months and maximum of 60 months. There were 77 subjects with headache with common cold as aggravating factor and 25 with sunlight exposure as aggravating factor. The most common symptom was nasal obstruction (94, 94%), followed by nasal discharge (90, 90%), post nasal drip (76, 76%), facial pain (74, 74%), nausea/vomiting (30, 30%), hyposmia (21, 21%), watering of eye (14, 14%), halitosis (7, 7%) and dental pain (5, 5%). All 100 patients underwent Diagnostic nasal endoscopy 74% patients had DNS, 40% patients had hypertrophied inferior turbinate. None of the patients had contact point with septum and lateral wall, which rules out contact point headache.

According to CT findings maxillary sinus was most common sinus involved, 93% had Maxillary sinusitis, and 43% had Ethmoidal and Frontal sinusitis and 22% had Sphenoidal sinusitis. Most common treatment given for patients was FESS (61, 61%), followed by FESS with septoplasty (30, 30%), septoplasty with antral wash (6, 6%) and Medical management (3, 3%). 20% patients had

persisting headache after medical and surgical line of treatment. These 20% patients also had symptoms of nausea/vomiting and sunlight exposure as aggravating factors. Thus we can conclude, incidence of vascular headache among patients attending with CRS and headache was 20%. The maximum incidence of vascular headache was found in 21–30 year age group (29.4%), followed by 41–50 years (25%), 31–40 years (14.3%), >51 years (12.5%) and <20 years (11.1%). In this study males had higher incidence of vascular headache (24.6%), compared to females (11.4%). Those with >1 year duration of headache had higher incidence of vascular headache (37.5%), compared to those with <1 year duration (14.5%). This difference was statistically significant.

Out of 25 patients who had pre-operatively sunlight exposure as aggravating factor, persistent headache was present in 60%, as compared to who did not have (6.8%). Similarly, out of 30 patients with pre-existing nausea/vomiting, 56.7% had persistent headache as compared to who did not have (4.3%). These incidences were found to be statistically significant (Table 1).

Discussion

Vascular headache and CRS are prevalent diseases that share similar symptoms and patient demographics [4, 5]. Both can be associated with headache, facial pain, nasal symptoms, and changes in environment [3, 6, 7]. The confusion occurs partly because migraine headache involves activation of trigeminal nerves, that innervates both the sinus region and meninges. Additionally nasal congestion can be a common feature of migraine headaches because of autonomic nerve stimulation that can also cause lacrimation and rhinorrhea. Para nasal sinuses play an important role in headache. Rhinitis and CRS may increase migraine-associated morbidity and increase migraine frequency ninefold through irritation of trigeminal nerve receptors [8, 9]. Symptom-based criteria is sensitive in diagnosing sinusitis [10] and may therefore be used for sinus pressure–pain–headache patients, ignoring culpable neurogenic factors. In our study we tried to evaluate other factors contributing to headache in these patients. Important clinical history included presence of headache (100%), nasal obstruction (93%), followed by nasal discharge (90%), facial pain (74%), postnasal drip (76%), nausea/vomiting (30%), hyposmia (21%), watering of eyes (14%), halitosis (7%), dental pain (5%). Results were similar to a prospective study conducted on 237 consecutive patients suffering from chronic sinusitis by Jakobsen and Svendstrup [11] concur with fact that, nasal obstruction was most frequent symptom (61%) followed by purulent nasal discharge, anosmia, frontal pain, headache and maxillary pain.

Table 1 Incidence of vascular headache with different co-existing symptomatology

	Vascular headache				<i>p</i>
	No		Yes		
	n	Percent	n	Percent	
<i>Nausea vomiting</i>					
Absent	67	95.7	3	4.3	<0.0001
Present	13	43.3	17	56.7	
<i>Facial pain</i>					
Absent	25	96.2	1	3.8	0.02
Present	55	74.3	19	25.7	
<i>Nasal obstruction</i>					
Absent	3	42.9	4	57.1	0.01
Present	77	82.8	16	17.2	
<i>Nasal discharge</i>					
Absent	4	40.0	6	60.0	0.001
Present	76	84.4	14	15.6	
<i>Post nasal drip</i>					
Absent	11	47.8	12	52.2	<0.0001
Present	69	90.8	7	9.2	
<i>Hyposmia</i>					
Absent	60	75.9	19	24.1	0.05
Present	20	95.2	1	4.8	
<i>Halitosis</i>					
Absent	74	79.6	19	20.4	0.7
Present	6	85.7	1	14.3	
<i>Dental pain</i>					
Absent	76	80.0	19	20.0	1
Present	4	80.0	1	20.0	
<i>Watering of eye</i>					
Absent	73	84.9	13	15.1	0.002
Present	7	50.0	7	50.0	

97% of our patients were treated with various surgical modalities like functional endoscopic sinus surgery (FESS) only (61%), FESS with Septoplasty (30%), Septoplasty with Antral wash (6%).

Among them, at postoperative follow-up of 6 months, 80% of patients with headache showed improvement. Study conducted by Damm et al. [12] on patients with CRS to assess impact of FESS on symptom profile also concur with fact that, post operatively an improvement in quality of life was achieved in 85%, Mainly responsible for this improvement was postoperative reduction in nasal obstruction (84%), headache (82%), and postnasal drip (74%) (All symptoms $p < 0.01$) [12]. Similar type of results were achieved in a study conducted by Erickson et al. [13]. The purpose of this study was to define the individual symptoms of a cohort of patients with medically refractory CRS using visual analogue scale (VAS) scores

as well as report symptom-based outcomes after ESS. Headache was the most commonly reported disabling condition. Follow-up data after ESS was available for 207 patients. Average VAS scores for 6 of 7 symptoms showed significant and sustainable postoperative improvement at 3, 6, 12, and 18 months after surgery ($p < 0.001$). Improvement in VAS score for headache was not statistically significant ($p > 0.700$). So at the end of this study it indicated that patients with medically refractory CRS presenting for surgery complained of associated symptoms with greater frequency. ESS results showed both statistically and clinically significant improvements in six of seven symptoms. Headache, which was the most highly ranked disabling symptom, did not show significant improvement from baseline [13].

In the present study persisting headache was recorded in 20%. It was compared with a study conducted by Welge-Leussen and Hauser [14]; 10 years follow up of the patients who had undergone FESS. Out of 20 patients, six patients remained completely free of pain (30%), seven had significant improvement (35%) and seven (35%) received no benefit from surgery (65% improvement) [14]. But in above two studies the reason for persisting of headache is not identified. In present study, complaints of persisting headache, was recorded in 20% of patients even after various modalities of treatment. The coexistence of symptoms of vascular headache, as defined by IHS diagnostic criteria [7], were assessed and the significance of each was calculated.

Conclusion

Vascular headache and CRS are common diseases with similar patient demographics and symptom profiles. Symptom based criteria is sensitive in diagnosing sinusitis. In our study, headache caused by chronic sinus infection definitely improved after surgical intervention. But those who had other factors contributing the headache like duration of headache more than 1 year, nausea/vomiting, facial pain and aggravating factors like exposure to sunlight, the headache persisted. It signifies that 20% CRS patients with headache were having co-existing vascular headache.

The study has a few limitations. Pain specific visual analogue scale scores were not used, instead symptomatic report of improvement was used and only vascular headache was targeted, it being next common cause of headache.

Compliance with Ethical Standards

Conflict of interest All authors declare that they have no conflict of interests.

Ethical Standard All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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