

**STUDY OF SINONASAL DISEASE IN CASES OF CHRONIC SUPPURATIVE OTITIS MEDIA**Prem Pal Singh<sup>1</sup>, Vaibhav Kuchhal<sup>2</sup>, Jaideep Bhatt<sup>3</sup>**HOW TO CITE THIS ARTICLE:**

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**ABSTRACT:** Total 100 patients of age group 6-65 years old of chronic suppurative otitis media (squamous type-33 and mucosal type-67) visiting ENT OPD with main complain related to ear were selected randomly and thorough ENT examination was done followed by nasal endoscopy and required radiological investigation. 64 patients were found having one or other nasal pathology that might be the culprit for ear disease of the total nasal pathologies maximum cases were of DNS alone or with Allergic rhinitis followed by nasal sinusitis and nasal polyps. The study concludes that nasal diseases are the precipitating factors for chronic suppurative otitis media so every case of CSOM should have through examination of nose and PNS to rule out sinonasal pathology.

**KEYWORDS:** chronic suppurative otitis media (CSOM) deviated nasal septum (DNS), diagnostic nasal endoscopy (DNE).

**INTRODUCTION:** Chronic Suppurative Otitis Media (CSOM) is a persistent inflammation that causes irreversible changes of the mucosa in the middle ear and mastoid cavity. It is characterized by a persistent discharge from the middle ear through a tympanic membrane perforation. It is an important cause of preventable hearing loss, particularly in the developing world (WHO, 2004).<sup>1</sup> Its pathophysiology begins with irritation and subsequent inflammation of the middle ear mucosa. The most important pathological factors in CSOM are dysfunction of the Eustachian tube and bacterial infection.

Sinonasal pathology frequently leads to ear disease. Improvement of otitis media pathology following septoplasty was noted by Grady (1983).<sup>2</sup> Von Cauwenberge and Derycke (1983)<sup>3</sup> and Kim et al. (1993)<sup>4</sup> also showed evidence of association of sinonasal pathologies in cases of otitis media. Bozkuset al. (2013)<sup>5</sup> demonstrated that the role of sinonasal abnormalities and allergic rhinitis in the pathogenesis of chronic otitis media is prevalent. They concluded that although medical history and physical examination are considered mandatory procedures during the initial evaluation of the patients with chronic otitis media, radiological, endoscopic, and other auxiliary diagnostic tools should be used in the objective assessment of the patients, and lesions of the nasal cavity, and the nasopharynx must be always taken into consideration in the differential diagnosis.

**AIMS AND OBJECTIVE:** Study of sinonasal diseases in patients of chronic suppurative otitis media.

**MATERIAL AND METHODS:** The present study was carried out at Department of Otorhinolaryngology, Dr Susheela Tiwari Government Hospital and Government Medical College, Haldwani.

**RESEARCH DESIGN:** Prospective Study.

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**STUDY AREA:** The present study was carried out in Department of Otorhinolaryngology, Government Medical College, Haldwani, Uttarakhand.

**STUDY PERIOD:** August, 2012 to September, 2013.

**STUDY POPULATION:** 100 patients of CSOM

**SAMPLING FRAME:** ENT OPD Patients with clinical signs and symptoms suggestive of Chronic Suppurative Otitis Media (CSOM).

**PERMISSIONS AND CLEARANCES:** Permission to carry out the study was obtained from the institutional ethical committee.

An informed consent was obtained from all the patients participating in the study.

Total 100 patients having a clinical diagnosis of chronic suppurative otitis media were invited to participate in the study and an informed consent was sought. All the patients providing consent to participate in the study were enrolled as study subjects.

After enrolment in the study, demographic data of the patient was noted on a semi-structured proforma prepared for the purpose. Clinical presentation including complaints related with ear and nose were noted.

The patients were then subjected to diagnostic nasal endoscopic examination of both the sides. Bilateral ear examination was done using Valsalva maneuver. Pure tone audiometry was also performed on all the cases to assess the effect on hearing status.

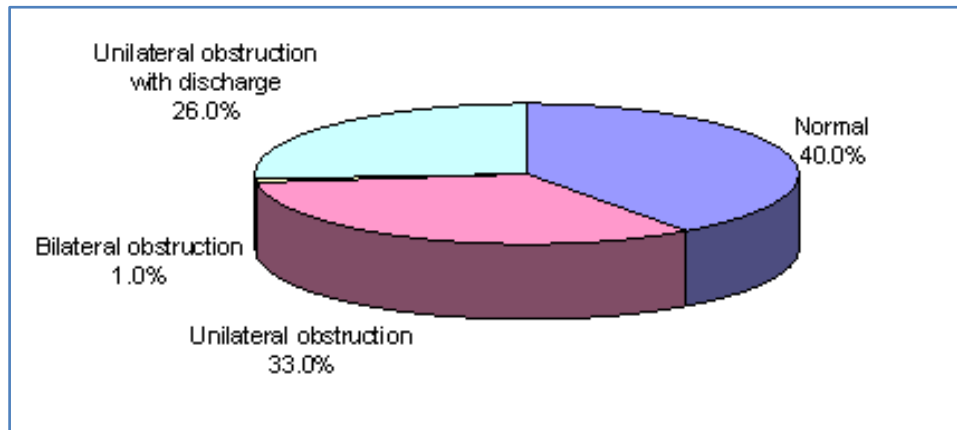
X-ray paranasal sinus and X-ray soft tissue nasopharynx were also performed. To evaluate the PNS findings more clearly, CT examination of paranasal sinus was also performed. On the basis of combination of clinical examination and outcome of investigations, a final diagnosis was prepared. All the patients were then recommended the treatment suitable to their diagnosis.

### RESULTS:

SL. NO.	Finding	No. of patients	Percentage
1.	<b>Ear side involved</b>		
	Left	33	33.0
	Right	41	41.0
	Bilateral	26	26.0
2.	<b>Nasal examination</b>		
	Normal	40	40.0
	Unilateral obstruction	33	33.0
	Bilateral obstruction	1	1.0
	Unilateral obstruction with discharge	26	26.0

Table 1: Clinical Examination Findings

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**Figure 1**

On nasal examination, 40(40%) cases had a normal finding. Unilateral obstruction alone was observed in 33(33%) cases while bilateral obstruction was observed in 1(1%) case. There were 26(26%) cases with unilateral obstruction and discharge.

SL. NO.	Finding	Right		Left	
		No.	%	No.	%
1.	Normal	44	44.0	49	49.0
2.	Anrtochoanal Polyp	3	3.0	1	1.0
3.	Adenoid	5	5.0	5	5.0
4.	Concha bulosa	1	1.0	0	0.0
5.	Deviated nasal septum	20	20.0	9	9.0
6.	Ethmoid polyp with/without DNS	2	2.0	2	2.0
7.	Inferior Turbinate Hypertrophy	5	5.0	9	9.0
8.	Middle meatus polyp	0	0.0	1	1.0
9.	Middle turbinate hypertrophy	0	0.0	1	1.0
10.	Mass in nasal cavity	2	2.0	2	2.0
11.	Pale mucosa	2	2.0	2	2.0
12.	Pan-sinusitis	1	1.0	1	1.0
13.	Polyp/Polypoidal mass with/without DNS	3	3.0	3	3.0
14.	Pus in middle meatus	12	12.0	15	15.0

**Table 2: DNE Examination Findings**

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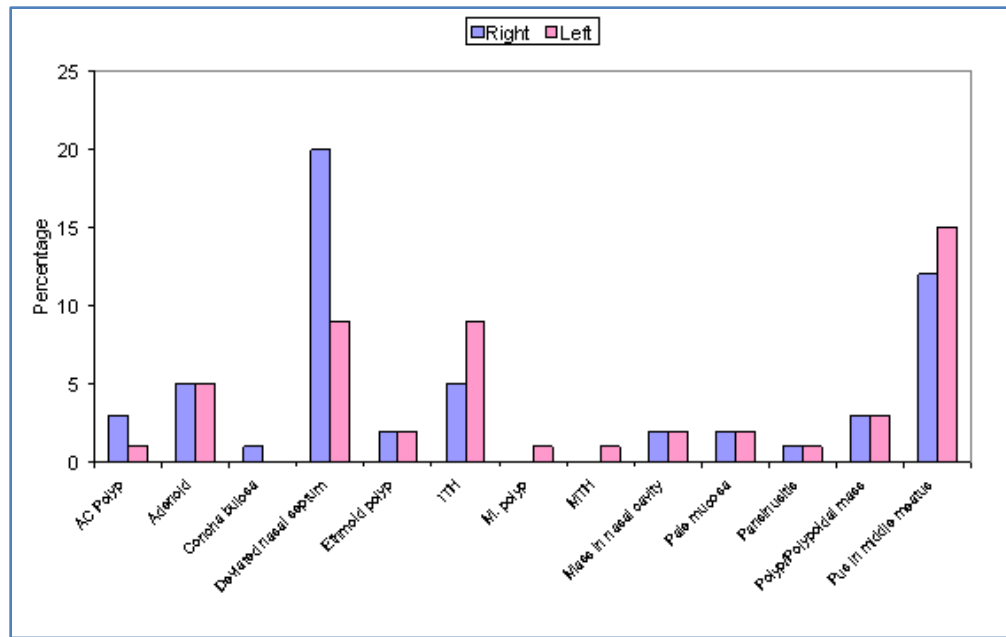


Figure 2

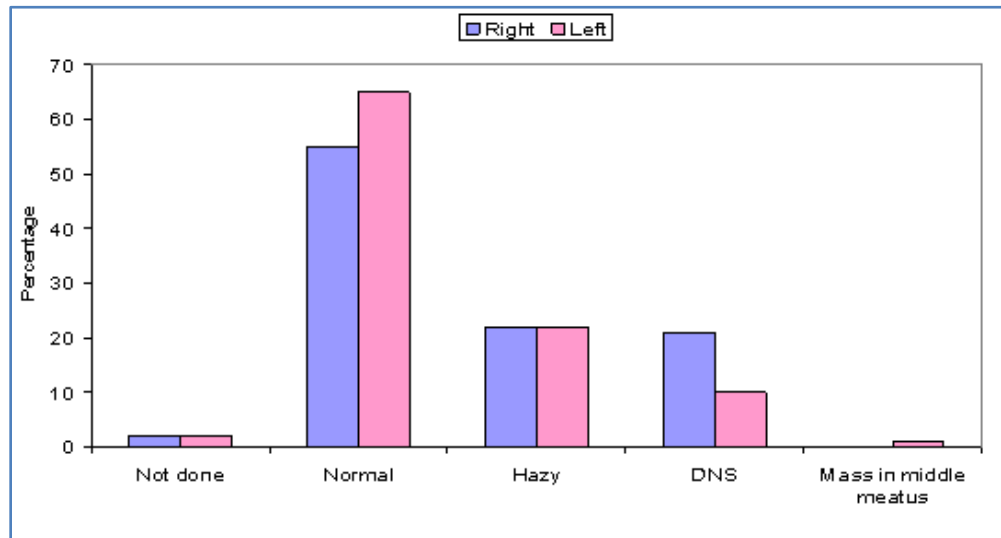
Deviated nasal septum alone (20%) or in combination with other findings and pus in middle meatus (12%) were the most common findings on DNE. Among different sinonasal pathologies, in right side presence of AC polyp (3%), adenoid (5%), ethmoid polyp (2%), ITH (5%), MTH (0%), mass in nasal cavity (2%), pan-sinusitis (1%), polyp/polypoidal mass with/without DNS (3%).

On left side too DNS, pus in middle meatus (15%) and DNS alone (9%) or in combination with other findings were the most common findings. adenoids (5%), AC polyp (1%), ethmoid poly with/without DNS (2%), ITH (9%), Middle meatus polyp (1%), MTH (1%), mass in nasal cavity (2%), pale mucosa (2%), pan-sinusitis (1%) and polyp/polypoidal mass with/without DNS (3%) were the other sinonasal pathologies involved.

Sl. No.	Finding	Right		Left	
		No.	%	No.	%
1.	Not done	2	2.0	2	2.0
2.	Normal	55	55.0	65	65.0
3.	Hazy	22	22.0	22	22.0
4.	DNS	21	21.0	10	10.0
5.	Mass in middle meatus	0	0	1	1.0

TABLE: 3X-ray findings

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**Figure 3**

X-ray PNS could not be done in 2 cases.

On right side, it was normal in 55 (55%), the appearance was hazy in 22 (22%) while DNS was observed in 21 (21%).

On left side, it was normal in 65 (65%), the appearance was hazy in 22 (22%) and DNS was observed in 10 (10%) cases. There was 1 (1%) patient who had mass in middle meatus.

### X-ray revealed involvement of soft tissue in 5(5%) cases:

SL. No.	Finding	Right		Left	
		No.	%	No.	%
1.	Not done	10	10.0	10	10.0
2.	Normal	55	55.0	49	49.0
3.	Antrochoanal Polyp	2	2.0	3	3.0
4.	Antrochoanal Polyp + DNS	0	0.0	1	1.0
5.	Adenoid	1	1.0	1	1.0
6.	DNS	9	9.0	16	16.0
7.	Ethmoidal polyp	4	4.0	3	3.0
8.	Maxillary. Polyp	1	1.0	0	0.0
9.	Maxillary sinusitis	9	9.0	9	9.0
10.	Mass in nasal cavity	1	1.0	1	1.0
11.	Nasal polyposis	1	1.0	1	1.0
12.	Pan-sinusitis	2	2.0	2	2.0
13.	Polypoidal mass with/without DNS	1	1.0	1	1.0
14.	Frontal Sinusitis	3	3.0	2	2.0
15.	Sinusitis with DNS	0	0.0	1	1.0

**Table 4: CT scan Findings**

CT scan was done in 90 cases

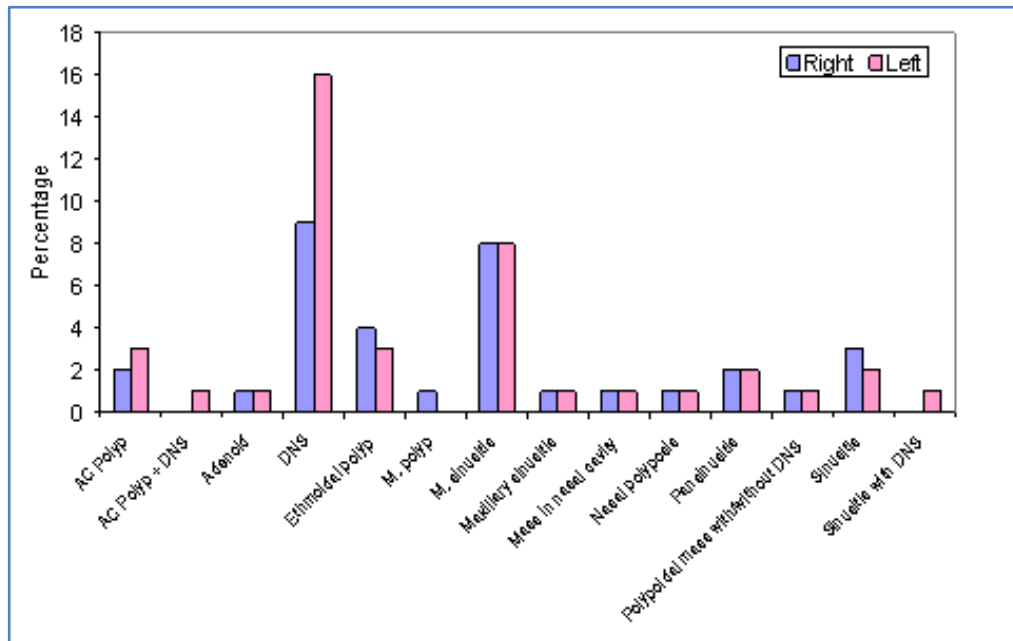


Figure 4

On right side, 55 cases had no sinonasal pathology. DNS alone (n=9) and in combination with other pathologies was the most common finding. Maxillary sinusitis (9%), ethmoidal polyp (4%), Frontal sinusitis alone (3%) were other common pathologies. Antrochoanal Polyp (2%), Adenoid (1%), Maxillary polyp (1%), Mass in nasal cavity (1%), pan-sinusitis (2%) and polypoidal mass (1%) were the other findings.

On left side, normal findings were observed in 49%, Antrochoanal polyp was observed in 3(3%) and AC polyp with DNS in 1(1%), Adenoid in 1(1%), DNS again was the most common single pathology (16%), ethmoidal polyps in 3(3%), maxillary sinusitis in 9%, mass in nasal cavity in 1%, nasal polyposis in 1%, pan-sinusitis in 2%, polypoidal mass with DNS in 1%, Frontal sinusitis in 2% and sinusitis with DNS in 1%.

**DISCUSSION:** The first step in diagnosis of chronic suppurative otitis media is to understand its underlying pathology, once underlying pathology is identified; it is easy to offer treatment for the disease. Identification and understanding of nasopharyngeal and sinonasal pathology of the disease helps to locate and understand the magnitude of the disease that helps in successful management of the disease.

Keeping in view the importance of nasopharyngeal and sinonasal pathology of CSOM, the present study was carried out on 100 patients of CSOM presenting to our Outpatient Department of Otolaryngology. Age of patients ranged from 6 to 65 years with a mean age of  $25.97 \pm 11.97$  years. Maximum number of patients (38%) was aged between 11-20 years. CSOM is defined primarily as a disease of pediatric age group (Nelson, 1988)<sup>6</sup>. Other workers like Shrestha et al (2010),<sup>7</sup> Karkiet al (2011),<sup>8</sup> Poorey and Iyer (2002)<sup>9</sup> also found maximum prevalence of CSOM in the younger age group.

Unilateral nasal obstruction with our without discharge was one of the most common findings (59%) on nasal examination. Bilateral obstruction was reported in only 1 (1%) cases. In a

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study by Bozkuset al. (2013)<sup>5</sup>, majority of patients with CSOM presented with nasal obstruction. In another study by Suarez Nieto et al (1983)<sup>10</sup> had reported that prevalence of secretory otitis was significantly related to nasal obstruction.

Diagnostic nasal endoscopy findings revealed DNS alone or in combination with other pathologies to be the most common findings. Similar observations were made by Yeolekar et al (2011)<sup>11</sup> in their study. Sinonasal pathology was positive in 64 (64%) cases. Yeolekar et al (2011)<sup>11</sup> reported presence of sinonasal pathology in 90% patients. Poorey and Iyer (2002)<sup>9</sup> reported presence of pharyngeal and sinonasal pathology in 93% patients.

However, clinical and investigational profile showed that evidence of sinonasal pathology is indicated by complications such as nasal obstruction, presence of Eustachian tube blockade, and abnormalities on PNS X-ray and CT findings.

The involvement of Eustachian tube in patients with sinonasal pathology might be attributed to the greater proportion of suppuration in cases having sinonasal pathology. Sinonasal pathology interrupts the passage to Eustachian tube thus showing higher prevalence of blockade leading to CSOM.

In present study among different sinonasal pathologies deviated nasal septum (DNS) was the most common finding. It was found to be present in a total of 31 cases – in 13 it was the solitary finding whereas in remaining 18 it was in combination – 14 with allergic rhinitis, 1 with sinusitis and 3 with polyps. These findings are in agreement with the findings of Yeolekar et al (2011)<sup>11</sup> and Bozkus et al (2013)<sup>5</sup> who also observed that deviated septum alone or in combination was the most common sinonasal pathology.

After DNS, allergic rhinitis was the most common finding. Seen alone in 4 cases and 15 in combination with other findings (14 with DNS and 1 with AR).Bozkuset al. (2013)<sup>5</sup>demonstrated that the role of sinonasal abnormalities and allergic rhinitis in the pathogenesis of chronic otitis media is prevalent. Ghonaim et al (2011)<sup>12</sup>also highlighted allergic rhinitis to be one of the important predictors of CSOM. Rhinitis is influential in the occurrence of CSOM via two mechanisms which include Eustachian tube dysfunction secondary to allergic reactions effective on nasal mucosa, and decrease in the frequency of ciliary whipping motions (Hurst, 2011).<sup>13</sup>

The prevalence of allergic rhinitis in present study was higher than that reported by Mion et al (2003)<sup>14</sup> who reported 15.69% cases of CSOM to be having a prevalence of 3.33% only. The reason for this could be difference in environment. In developed countries where the environmental stimulants working as allergens are lower, the prevalence of allergic rhinitis could be lower as compared to that in developing countries.

Sinusitis was also one of the common findings observed as independent finding in 12 patients and 2 in combination – one with DNS and another with AR. Fujita et al. (1993)<sup>15</sup>reported sinusitis to be present in 48% cases of refractory otitis media. The prevalence of sinusitis in present study was similar to that reported by Yeolekar et al (2011)<sup>11</sup> (13.5%). Gopalakrishnan and Kumar (2012)<sup>16</sup> reported sinusitis to be a major pathology of CSOM in adult subjects.

Fireman et al. (1988)<sup>17</sup> emphasized that otitis media is a multifactorial disease which was effected by many etiologies including nasal, and paranasal sinus abnormalities. The present study confirmed these observations. Bluestone et al. (1975)<sup>18</sup>were of the view that that diseases of the sinuses are the main cause of CSOM rather than adenoid in adolescents and adults for Eustachian tube block.

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However, all the cases with adenoid involvement were adolescent, though it does not prove that adenoid involvement is the major pathology in adolescents yet it shows that adenoids involvement is more common in adolescents as compared to adults, thus adenoid hypertrophy can be proposed as a risk for CSOM in adolescents.

**CONCLUSION:** Out of total 100 patients studied 64 patients were found positive for Sino nasal pathology of different types found to be the causative factor for chronic suppurative otitis media. So this study concludes that Sino nasal pathologies are the major risk factor for CSOM and in order to treat the CSOM, first the sino nasal pathologies should be ruled out and should be addressed first followed by ear pathology.

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