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## RESEARCH ARTICLE

### SECONDARY OTOMYCOSIS IN CHRONIC OTITIS MEDIA PATIENTS.

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#### Manuscript Info

#### Abstract

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#### Introduction:-

Many fungi are present as commensals in the ear. It is often debatable whether or not these organisms are the cause of the condition under investigation. The immediate attention is being directed to a relatively narrow range of bacteria. Moreover therapy directed toward fungi yields dramatic response.

Their suspicion were aroused through consideration of the problem of intractable ear discharge due either to otitis externa or infection of the mastoid open cavities, and its relation to the increased use of topical antibiotics, known to favour overgrowth of fungus. Confirmation of these suspicions in almost 50 percent of the cases indicates the real nature of the disease. A secondary invasion of the primary bacterial infection leading to chronicity and apparent resistance to the treatment.

Chronic Suppurative Otitis media (CSOM) is an inflammatory process in the middle ear cleft that results in long term, permanent changes in the tympanic membrane. Chronic suppurative otitis media causes recurrent ear discharge and perforation of the ear drum, requiring long term treatment and follow up. Otitis media is known to be one of most common childhood infections and a leading reason for the antibiotic prescriptions in the developed world. Fungal infections on chronic suppurative otitis media is suspected when the discharging ear does not respond to the local antibiotic ear drops.

The purpose of this study is to emphasize the importance of the usage of local antibiotic with antifungal ear drops in chronic suppurative otitis media patients

#### Aim And Objectives:-

1. To identify mycological agents and the distribution in the discharging ear of Chronic otitis media patients
2. To analyse the relation of local antibiotics, antibiotics with steroids and antibiotics & antifungals with steroids in fungal growth occurring in Chronic otitis media patients.

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## Materials And Methods:-

Patients presenting with symptoms and signs of Chronic Suppurative otitis media were being selected as the study population. The study was conducted on 150 cases on patients attending ENT Out Patient Department at Government Rajaji Hospital, Madurai. The clinical diagnosis was based on ear discharge, ear itching sensation, ear blocking sensation and the fungal debris in the ear canal.

### Inclusion Criteria:-

1. Patients with Chronic Otitis Media with Active Discharge.
2. Patients presenting with ear discharge, ear pain, ear itching sensation.
3. Age of above 12 years.
4. All sexes.

### Exclusion Criteria:-

1. Patients with Acute Otitis media, Cholesteatoma.
2. Age of less than 12 years.
3. Patients with complications of suppurative otitis media such as acute mastoiditis, meningitis, brain abscess, petrositis, labyrinthitis, etc.
4. Patients with immunocompromised states such as Diabetes Mellitus, HIV, Malignancy etc.
5. Patients with previously operated ear.
6. Patients with anatomical abnormalities of the external auditory canal such as stenosis of ear canal or an exostosis of the ear canal.

The pinna and the ear canal were cleaned with an antiseptic. The ear samples were collected from the ear canal using two moist sterile ear swabs for mycological examination. The samples were sent to the Institute of Microbiology for mycological diagnosis by performing direct microscopy in 10% KOH mount and fungal culture by Sabouraud Dextrose agar

### Otoscopy:-

Appearance of the ear canal and tympanic membrane and presence of ear wax/cerumen, ear discharge, ear infection and fungal debris were documented.

### 10% KOH Mount:-

For direct microscopy, a drop of 10% KOH aqueous solution (a keratolytic agent consisting of 10 gms of potassium hydroxide, 10ml glycerine, distilled water 80ml mixed together and stored at room temperature) was used for identification of fungal elements

### Fungal culture:-

For fungal culture SABOURAUD'S DEXTROSE AGAR MEDIA was used. Gentamycin was added to reduce contamination of bacteria. The pathological material was inoculated in a zig-zag manner on the media and kept in incubator at 25 degree Celsius and 37 degree Celsius, and observed every alternated day for rate of fungal growth, general morphology of colony texture, surface pigmentation up to 6 weeks

### Lactophenol Cotton Blue Mount:-

Under direct microscopy, a glass slide with lactophenol cotton blue with a small piece of fungal growth covered with a cover slip, was viewed. Morphology of the fungus was studied  
FOLLOW UP:

The patients were being divided into three groups randomly each containing a study population of 50.

1. Group A – Local Antibiotic Ear Drops Prescribed
2. Group B – Local Antibiotic and Steroid Ear drops Prescribed
3. Group C – Local Antibiotic and Antifungal Ear Drops Prescribed

The antibiotic chosen in our study was 0.3% Ofloxacin. The antifungal chosen in our study was 1% Clotrimazole.

The patients were being followed up each week for a period of 8 weeks by otoscopic examination of ear. After 8 weeks, fungal swab was taken again and checked for the presence of fungal species. The presence of fungal species was compared with the three groups and the results were evaluated.

### Results:-

A total of 150 cases of Chronic Suppurative Otitis Media patients were selected for this study, from Department of ENT, Government Rajaji Hospital, Madurai for a period of one year from 2016 to 2017.

Among 150 patients with chronic suppurative otitis media, 22 patients had an associated otomycosis.

### Age wise distribution:-

Age wise distribution of associated otomycosis in the chronic suppurative otitis media patients was made. It was found that 3 out of 9 cases among 12-20 years (33.3%), 5 out of 36 cases among 21-30 years (13.9%), 6 out of 45 cases among 31-40 years (13.3%), 4 out of 34 cases among 41-50 years (11.8%), 3 out of 19 cases among 51-60 years (15.8%), 1 out of 7 cases among more than 60 years (14.3%) had an associated otomycosis in chronic suppurative otitis media patients.

Age Group (in years)	CSOM patients (n=150)	Associated Otomycosis (n=22)	Percentage of Associated Otomycosis Among Individual Age Group
	No.	No. (%)	%
12- 20	9	3 (13.6)	33.3
21 - 30	36	5 (22.7)	13.9
31 – 40	45	6 (27.3)	13.3
41 – 50	34	4 (18.2)	11.8
51 – 60	19	3 (13.6)	15.8
>60	7	1 (4.5)	14.3

### Sex wise distribution:-

Sex wise distribution of associated otomycosis in chronic suppurative otitis media patients was made. 11 out of 81 patients among male patients (13.6%), 11 out of 69 patients among female patients (15.9%) had associated otomycosis in chronic suppurative otitis media.

Gender	CSOM patients (n=150)	Associated Otomycosis (n=22)	Percentage of Associated Otomycosis Among Individual Gender
	No.	No. (%)	%
Male	81	11 (50.0)	13.6
Female	69	11 (50.0)	15.9

### Occupation wise distribution:-

Occupation	CSOM patients (n=150)	Associated Otomycosis (n=22)	Percentage of Associated Otomycosis Among Individual Occupation
	No.	No. (%)	%
Housewife	53	6 (27.3)	11.3
Farmer	25	3 (13.6)	12.0
Labourer	20	1 (4.5)	5.0
Teacher	2	1 (4.5)	50.0
Student	25	4 (18.2)	16.0
Driver	10	2 (9.1)	20.0
Professional	3	2 (9.1)	66.7
Others*	12	3 (13.6)	25.0

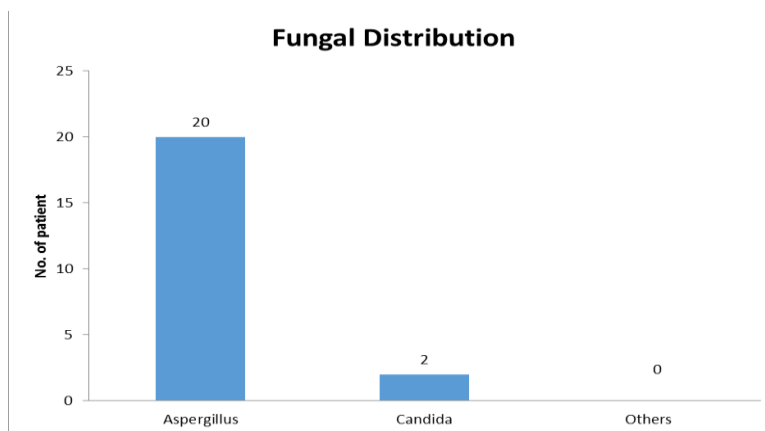
\*Others include Business, Clerk, Salesman and Sweeper

Occupation wise distribution of associated otomycosis in chronic suppurative otitis media patients was made. 6 out of 53 patients among housewives (13.6%), 3 out of 25 patients among farmers (13.6%), 1 out of 20 patients among labourers (13.6%), 1 out of 2 patients among teachers (13.6%) , 2 out of 25 patients among students (13.6%) , 2 out of 10 patients among drivers (13.6%) , 11 out of 81 patients among professionals (13.6%), 3 out of 12 patients among others which include businessmen, clerk, salesman and sweeper (13.6%)

#### Fungal Distribution:-

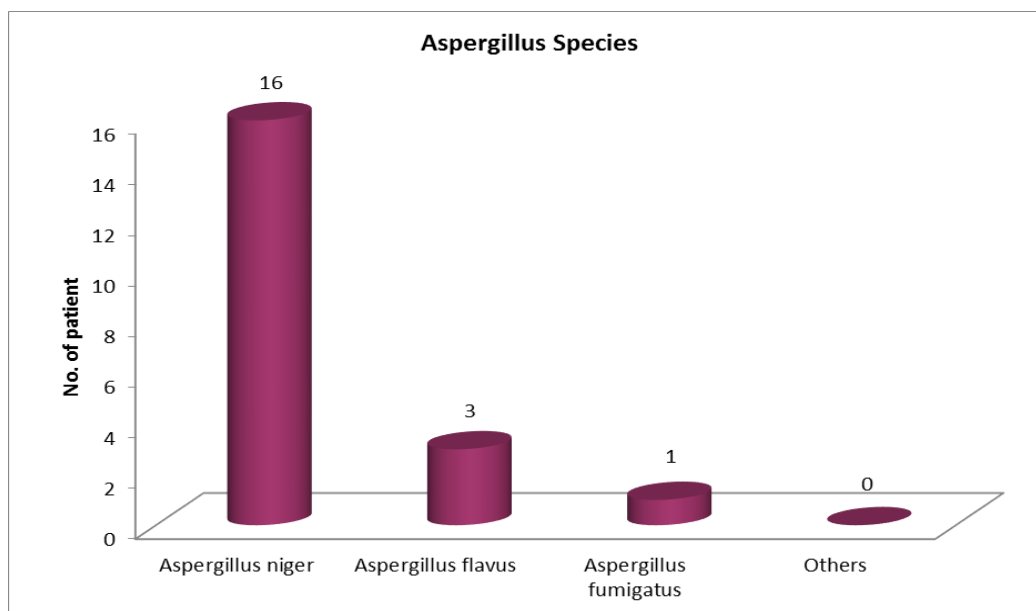
The fungal isolates were analysed among the chronic suppurative otitis media patients. Among 150 patients with chronic suppurative otitis media, 22 patients had an associated otomycosis. Among 22 patients, 20 patients (90.9%) had isolates of *Aspergillus* species, 2 patients (9.1%) had isolates of *Candida* species. No other fungal isolates other than *aspergillus* and *candida* detected. *Aspergillus* species was the most common fungus isolated.

Fungus	No. (%)
<i>Aspergillus</i>	20 (90.9)
<i>Candida</i>	2 (9.1)
Others	0 (0.0)
Total	22 (100.0)



Among 20 *Aspergillus* isolates, 16 isolates (80%) of *Aspergillus niger*, 3 isolates (15%) of *Aspergillus flavus*, 1 isolate (5%) of *Aspergillus fumigatus* were detected. *Aspergillus niger* species was the most common *Aspergillus* species detected.

<i>Aspergillus</i> Species	No. (%)
<i>Aspergillus niger</i>	16 (80.0)
<i>Aspergillus flavus</i>	3 (15.0)
<i>Aspergillus fumigatus</i>	1 (5.0)
Others	0 (0.0)
Total	20 (100.0)



### Repeat Fungal Culture:-

The patients were being followed up each week for a period of 8 weeks by otoscopic examination of ear. After 8 weeks, fungal swab was taken again and checked for the presence of fungal species. The presence of fungal species were compared with the three groups and the results were evaluated.

In group A, among 50 persons who were administering antibiotics, 12 persons (24%) had Aspergillus isolated.

In group B, among 50 persons who were administering antibiotics with steroids, 22 persons had fungal isolates. Among 22 persons, 20 (40%) were isolates of Aspergillus species and 2 (4%) were isolates of Candida species.

In group C, among 50 patients who were administering antibiotics and antifungals with steroids, no isolates of fungus were isolated.

Group	Local Drug Administered	Species	No. (%)
A (n=50)	Antibiotics	Aspergillus	12 (24.0)
		Candida	0 (0.0)
B (n=50)	Antibiotics with Steroids	Aspergillus	20 (40.0)
		Candida	2 (4.0)
C (n=50)	Antibiotics and Antifungals	Aspergillus	0 (0.0)
		Candida	0 (0.0)

Group	Fungus No. (%)	No Growth No. (%)
Antibiotics	12 (35.3)	38 (32.8)
Antibiotics with Steroids	22 (64.7)	28 (24.1)
Antibiotics and Antifungals with steroids	0 (0.0)	50 (43.1)
Total	34 (100.0)	116 (100.0)
P Value	<0.001 (Significant)	

### Discussion:-

During the study period from 2016 to 2017, 150 patients with chronic suppurative otitis media were selected. The clinical diagnosis is based on ear discharge, ear itching sensation, ear blocking sensation and the fungal debris in the ear canal. Fungal culture was done with ear discharge being collected.

Among 150 patients with chronic suppurative otitis media, 22 patients had an associated otomycosis in our study. Baruah (1969) conducted a study of 100 cases of CSOM and found fungus positive in 18 cases (18%)<sup>2</sup>. Khanna V et al (2010) conducted study of 110 cases of CSOM and found fungus positive in 26 cases (23.63%)<sup>19</sup>.

20 patients (90.9%) had isolates of *Aspergillus* species and 2 patients (9.1%) had isolates of *Candida* species among 22 patients with associated otomycosis. *Aspergillus* species was the most common fungus isolated in our study. Our study correlates with the findings of Dhingra R et al who also found that *Aspergillus* as the most common fungus isolated in their study<sup>10</sup>.

16 isolates (80%) of *Aspergillus niger*, 3 isolates (15%) of *Aspergillus flavus* and 1 isolate (5%) of *Aspergillus fumigatus* were detected among 20 patients. *Aspergillus niger* was the most common *Aspergillus* species isolated in our study. This correlates with Reena Ray study in which *Aspergillus niger* was the most common *aspergillus* isolate<sup>30</sup>.

The increased incidence of *Aspergillus niger* may be due to their spores. They are found profusely in the atmosphere during the rainy season, due the abundance of the dead organic matter on which they grow. They thrive on the fallen leaves and in the compost heaps and may be found in the vegetative materials.

The patients were being followed up each week for a period of 8 weeks by otoscopic examination of ear. After 8 weeks, fungal swab was taken again and checked for the presence of fungal species. The presence of fungal species were compared with the three groups and the results were evaluated.

In group A, among 50 persons who were administering antibiotics, 12 persons (24%) had fungus isolates. In group B, among 50 persons who were administering antibiotics with steroids, 22 persons had fungal isolates. Dhingra R et al also found out that the incidence of fungal growth is more in patients using antibiotics and steroids in chronic suppurative otitis media patients<sup>10</sup>.

In group C, among 50 patients who were administering antibiotics and antifungals with steroids, no fungus were isolated.

### **Conclusion:-**

Most common fungus isolated in chronic suppurative otitis media was *Aspergillus*.

Most common *Aspergillus* species isolated in chronic suppurative otitis media was *Aspergillus niger*.

The antibiotic drop apart from moist and alkaline medium of discharge appears to be mainly responsible for fungal growth and when steroids are added the fungal growth incidence is increased. Thus local drops should be used with great care in treating chronic suppurative otitis media.

Local antibiotic drops with anti-fungal agents may be the ideal treatment in chronic cases.

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