

## Conjunctival Mycoflora in Patients Presenting to Eye Ward of Imam Khomeini Hospital, Ahvaz

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### ABSTRACT

**Objectives:** To investigate the incidence of fungal mycoflora of conjunctiva in patients attending teaching department of ophthalmology, Imam Khomeini Hospital, Ahvaz, Iran.

**Methodology:** One hundred and seventy two swabs were collected from the conjunctiva of patients attending to eye ward of the hospital during autumn 2007 to summer 2008. Swabs were cultured on Sabouraud's Dextrose Agar and incubated at ambient temperature for one week.

**Results:** Eleven patients were positive for saprophytic fungi. The most common saprophytic fungus was *Cladopsorium* (four cases). Other filamentous fungi were *Drechslera* (one case), *Alternaria* (one case), *Fusarium* (one case) and *Epicoccum* (one case). In addition, three isolates of yeasts include *Cryptococcus*, *Candida albicans* and *Rhodotorula rubra* were also isolated from patients.

**Conclusion:** There was a remarkable presence of fungi in the conjunctiva of patients. The environmental conditions, the socioeconomic status and personal poor hygienic conditions, led to the high incidence of conjunctival fungus isolation (6.4%). The incidence was much higher in males (72.7%) as (27.3%) in females.

**KEY WORDS:** Conjunctiva, Mycoflora, Fungi, Saprophyte.

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### INTRODUCTION

The conjunctiva is a mucous membrane lining the posterior surface of eyelid and the anterior surface of globe as far as the limbus. The conjunctiva consists of stratified nonkeratinizing squamous epithelium that is intersepted with mucous-containing goblet cells, which are most common in the fornices and plica semilunaris. The epithelium layer covers a substantia propria that is thickest in the fornices and thinnest covering the tarsus. Due to direct contact with the environment, the conjunctival sac is expected to harbour several microorganisms such as saprophytic fungi.<sup>1,2</sup>

The spectrum of normal ocular microbial flora varies with the age, occupation, predisposing disease and even geographic location of the host.<sup>3-7</sup> Under the appropriate culture condition, some of the fungi (e.g. *Candida* species) may also be cultured from the eye. Fungi, which include both yeasts and moulds, are part of the normal eyelid flora in up to 17% of the

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normal population, but they are not normal colonizer of the human conjunctiva. In addition a variable incidence of fungal isolations from the conjunctival sacs was reported.<sup>2</sup>

Several reports show that the incidence of mycotic infection of eyes increased in the last decade.<sup>1</sup> However there are few cases of fungal infection of the conjunctiva in literatures. It seems that several mechanisms in conjunctiva prevent the overgrowth of microorganisms. The compromised eye may harbour more fungi in the conjunctiva than the normal conjunctiva. Clinically, the use of antibiotics or topical corticosteroids, or a condition such as dry eye, may alter the spectrum of eyelid and conjunctiva flora and they are most common predisposing factors for infection.<sup>1,6,7</sup>

Eyes fungal infections are usually caused by environmental endogenous fungi that have been related to the indoor/outdoor air microbial pollution.<sup>8</sup> Fungi may infect the ocular structures such as cornea, orbit, conjunctiva etc. Known causative organisms include *Fusarium*, *Aspergillus*, *Nocardia*, *Candida albicans*, and dematiaceous fungi.<sup>8-11</sup> Fungal candida can survive for years on the air and soils and transferred to eyes via the hands and/or dust. The aim of the present study was to investigate the incidence of fungal mycoflora of conjunctiva in patients attending the teaching department of ophthalmology, Imam Khomeini Hospital, Ahvaz.

## METHODOLOGY

One hundred and seventy two swabs were collected from the conjunctiva of patients with no history of ocular infections in both sexes attending the eye ward of the hospital during autumn 2007 to summer 2008. Swabs were inoculated on slants of Sabouraud's dextrose agar, SDA (Merck, Germany), and then incubated at ambient temperature for one week. Cultures were examined daily for any growth of fungi. The grown filamentous fungi were isolated and sub cultured on fresh SDA and incubated at room temperature. In addition, suspected colonies to yeasts were also cultured on CHROMagar Candida (CHROMagar Candida Company, Paris, France) and incubated at 37°C.

Yeasts were identified based on colony morphology on SDA and CHROMagar Candida, microscopic morphology of slide cultures, and differential tests.<sup>12,13</sup> Saprophytic fungi were also detected on the base of colony morphology on SDA and microscopic morphology of slide cultures.

## RESULTS

In the present study 172 patients were sampled, 109 (63.4%) were males and 63 (36.6%) females. The age range patients were 3-82 years (mean 42.5 year). The distribution of patients was in spring 19.2%, summer 32.6% autumn 23.8% and winter 24.4%. Samples from 11(6.4%) patients (8 males, 3 females) were positive for saprophytic fungi. The most common saprophytic fungus was *Cladosporium* (four cases). Other filamentous fungi were *Drechslera* (one case), *Alternaria* (one case), *Fusarium* (one case) and *Epicoccum* (one case).

## DISCUSSION

Most eye infections are endogenous in nature and have been related to the air microbial pollution.<sup>14</sup> These infections are attributed to contaminants, which are distributed in the environment.<sup>15</sup> There is a correlation between seasonality and microbial contamination rates.<sup>16</sup> In the present study 72.7% of isolates were filamentous fungi that presented largely due to airborne contamination in environment and spoiled plant. The incidence of airborne fungi is dependent on season, temperature and relative humidity. In the present, study eight and three isolates of saprophytic fungi were respectively isolated during spring-summer and autumn-winter seasons.

In a study conducted by Dalfré et al. 64% of investigated subjects had one or more genera of fungi in their conjunctiva.<sup>7</sup> They were isolated *Fusarium sp.*, *Geotrichum sp.*, *Cladosporium sp.*, *Penicillium sp.*, *Mucor sp.* and *Oidium sp.* However in Sehgal et al. study only 16% of the total specimens from conjunctiva yielded positive fungal isolations.<sup>1</sup> In another study 6.6% from healthy conjunctivas were positive for different fungi, *Cladosporium*, *Aspergillus*, *Fusarium*, and *Rhizoctonia* species (Ando and Takatori). In our study 72.7% of positive cultures were observed in male that is similar to other studies.<sup>1</sup> Fleiszig et al. did isolate *C. albicans* from conjunctiva in contact lens wearer.<sup>17</sup> Conjunctiva flora could change in different occupation<sup>1</sup>, Behcet patients<sup>18</sup> Hansen's disease<sup>3</sup> HIV patients.<sup>19</sup> In addition, three isolates of yeasts include *Candida albicans*, *Rhodotorula rubra* and *Cryptococcus* species were also isolated from patients. Both *C. albicans* and *R. rubra* are human normal flora and cause infection in compromised patients. Gunduz et al. compared fungal flora of conjunctiva in Behcet patients with normal population. They found *Candida* species in 6% of patients compared to 2% in control group.<sup>18</sup>

Khuzestan is a subtropical province in Iran and the ambient temperatures reach its peak during March to September. The weather could offer an ideal environment for the growth many of fungi.

### CONCLUSION

There was a remarkable presence of fungi in the conjunctiva of patients. The environmental conditions, the socioeconomic status and personal poor hygienic conditions, led to the high incidence of conjunctiva fungus isolation (6.4%). The incidence was much higher in males (72.7%) as (27.3%) in females.

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### REFERENCES

1. Sehgal SC, Dhawan S, Chhiber S, Sharma M, Talwar P. Frequency and significance of fungal isolations from conjunctival sac and their role in ocular infections. *Mycopathologia* 1981;73:17-9.
2. Eghtedari M, Pakshir K. Asymptomatic fungal cyst of conjunctiva caused by *Bipolaris spicifera*. *Iran J Med Sci* 2006;31:56-8.
3. Santos PM, Melo CM, Martins SA, Chaves Ade A, SÃ; DS, Santos RC. Study of ocular fungal microbiota in patients with Hansen's disease and in individuals who deal with them. *Arq Bras Oftalmol* 2006;69:915-8.
4. Fleiszig SM, Efron N. Microbial flora in eyes of current and former contact lens wearers. *J Clin Microbiol* 1992;30:1156-61.
5. Lee PW, Jun AK, Cho BC. A study of microbial flora of conjunctival sac in newborns. *Korean J Ophthalmol* 1989;3:38-41.
6. Srinivasa Rao PN, Rao K. Study of the normal conjunctival flora (bacterial and fungal) and its relations to external ocular infections. *Indian J Ophthalmol* 1972;20:164-70.
7. Dalfré JT, Rodrigues JP, Donato BG. Fungic microbiota of normal conjunctiva, sugar-cane and anemophilous fungi of the region of Monte Belo - Minas Gerais. *Arq Bras Oftalmol* 2007;70:445-9.
8. Feghhi M, Zarei Mahmoudabadi A, Mehdinejad M. Evaluation of fungal and bacterial contaminations of patient-used ocular drops. *Med Mycol* 2008;46:17-21.
9. Micallef C, Cuschieri P. Ocular infections due to contaminated solutions. *Ophthalmologica* 2001;215:337-50.
10. Rippon JW. *Medical mycology. The pathogenic fungi and actinomycetes*, 3th ed. Philadelphia: WB Saunders Co, 1988; 666.
11. Thomas PA. Current perspectives on ophthalmic mycoses. *Clin Microbiol Rev* 2003;16:730-797.
12. Zarei Mahmoudabadi A, Drucker DB, Mandall N, O'Brien K, Theaker E. Isolation and identification of *Candida* species from the oral cavity using CHROMagar *Candida*. *IBJ* 2000;4:57-61.
13. Zarei Mahmoudabadi A. *Medical mycology*. Qom: Vasef Co, 2003; 129.
14. Menzies D, Bourbeau J. Building-related illnesses. *N Engl J Med* 1997;337:1524-31.
15. Stone V. Environmental air pollution. *Am J Respir Crit Care Med* 2000;162:S44-S7.
16. Nunes ZG, Martins AS, Altoe AL. Indoor air microbiological evaluation of offices, hospitals, industries, and shopping centres. *Mem Inst Oswaldo Cruz* 2005;100:351-7.
17. Fleiszig SM, Efron N. Microbial flora in eyes of current and former contact lens wearers. *J Clin Microbiol* 1992;30:1156-61.
18. Gunduz A, Cumurcu T, Seyrek A. Conjunctival flora in Behcet patients. *Can J Ophthalmol* 2008;43:476-9.
19. Karcioğlu ZA, Akula S, Hildebrand P, Akdamar-Lee F, Janney A, Mera R. Conjunctival flora in HIV infected individuals and non-HIV controls. *Int Conf AIDS* 1992;8:94.