

## EVALUATION OF NESTED PCR FOR THE DIAGNOSIS OF *ASPERGILLUS RHINOSINUSITIS* IN COMPARISON WITH CONVENTIONAL METHODS

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**ABSTRACT** : Rhinosinusitis is defined as symptomatic inflammation of nasal passage and paranasal sinuses. It is caused by various causative agents such as viruses, bacteria and allergens. Fungal rhinosinusitis increasing frequency during the last two decades may be due to technological advances and awareness. *Aspergillus* species are reported as the major causative agents of fungal rhinosinusitis. Evaluation of nested PCR for detection of aspergillosis in patients suffering from rhinosinusitis. The study involved 60 patients with symptoms of rhinosinusitis. Nasal swabs and biopsies were collected prospectively from patients of all age groups and of both males and females with a clinical diagnosis of rhinosinusitis. All specimens were transported to the laboratory for processing and investigations at the same day and then portion of each biopsy was stored in Eppendorf tube containing ethanol 99%. This portion of tissue was preserved for identification of *Aspergillus* by nested PCR technique. Direct examination of tissue showed that 1.7 % contained fungal components and 41.7 % exhibited growth of *Aspergillus*. The most common species isolated were *A. fumigatus* (92%), followed by *A. flavus* (8%). Positive nested PCR results were obtained in 43.3% out of 60 patients. Current results suggest that nasal swabs were unreliable samples for the detection of *Aspergillus* elements by microscopy and culture. This drawback is a limiting factor for diagnosis of aspergillus rhinosinusitis. Therefore, nested PCR and conventional culture technique are helpful complementary diagnostic methods for detection of *Aspergillus* in nasal tissues with appropriate managements.

**Key words** : *Aspergillus*, rhinosinusitis, nested PCR.

### INTRODUCTION

Rhinosinusitis (RS) is defined as symptomatic inflammation of paranasal sinuses and nasal cavity; It is caused by various etiological agents such as viruses, bacteria and allergens. RS is commonly classified to acute rhinosinusitis (ARS) which diagnosed when patients have four or more episodes of rhinosinusitis per year (without persistent symptoms in between). When symptoms continue to last for more than twelve weeks (with or without acute exacerbation), it is termed chronic rhinosinusitis (CRS). (Sharma *et al*, 2017; Dykewicz MS *et al*, 2010)

Rhinosinusitis affects about 37 million people yearly, occurring in both immunocompetent and immunocompromised individuals, resulting in billions spent on physician visits and treatment (NIAID, 2002; CDC, 2003); A number of various etiological agents and pathologies are associated with rhinosinusitis (Fidelet *et al*, 2006). Acute or chronic rhinosinusitis is a common condition affecting up to 20% of the population, while

acute rhinosinusitis is associated with upper respiratory tract infections such as viral or bacterial, and is self-limited; Chronic rhinosinusitis has a slow protracted course and has different etiologies, fungal infection being the major cause of chronic rhinosinusitis; Fungi are one of the proposed etiological agents and are seen in (6–12)% of these patients. (Das *et al*, 2009; Granville *et al*, 2004)

The incidence of fungal rhinosinusitis (FRS) has been observed increase during the past decades may be due to awareness and technological advances; nevertheless, diagnosis is often delayed and recognized only after failure of antibiotic treatments (Fidel *et al*, 2006; Chander *et al*, 2017; Garg S. *et al*, 2013). *Aspergillus* species are reported as the major etiologic agents of fungal rhinosinusitis, although many other fungi have been reported to cause disease. (Jahrsdoerfer *et al*, 1979).

Early diagnosis and initiation of antifungal therapy are essential to reduce the high rate of mortality; conventional method is laborious because culture of the