

## A Rare Case of Diphtheria with Nasal & Tonsillar Membrane

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### Abstract:

Diphtheria caused by *Corynebacterium diphtheriae* is a toxin-mediated upper respiratory tract infection. It spreads by airborne respiratory droplets and commonly affects children. The implementation of a Universal Immunization Program has resulted in a decline in the incidence.

Over the last decade, the re-emergence of this infection has been noted and case reports from India have been on the rise. India represents nearly 78% of globally reported cases with significant mortality despite national immunization programs in place. We report a 7 year old male child presented with complaints of fever for 4 days which is high grade, continuous and associated with chills and sore throat since 4 days. He later developed breathlessness since the last 2 days, dysphagia and hoarseness of voice. On examination child is very sick looking, febrile, tachycardia, **tonsillar and nasal membrane** present which is covering the external nasal openings, respiratory distress present. The child was diagnosed as a case of **Diphtheria with tonsillar and nasal membrane**.

**Keywords :** *Corynebacterium*, Diphtheria, membrane, antitoxin

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### I. Introduction:

Diphtheria is a paradigm of the toxigenic infectious diseases. Diphtheria is highly contagious and is most commonly an infection of the upper respiratory tract and causes fever, sore throat and malaise. It is an acute toxic infection caused by *Corynebacterium* species, typically *Corynebacterium diphtheriae* and less often toxigenic strains of *Corynebacterium ulcerans*. It spreads through close contact or droplet infection from a case or carrier. Carriers are an important source of infection. A thick, gray-green fibrin membrane, the pseudomembrane, often forms over the site(s) of infection as a result of the combined effects of bacterial growth, toxin production, necrosis of underlying tissues, and the host immune response.

Case reports noting the possible resurgence of diphtheria in India are on the rise, despite multiple national immunization programs in place like "Mission Indradhanush" (MI) and "Intensified Mission Indradhanush" (IMI), which are the most important steps toward the hope of diphtheria free nation.

India follows the universal immunization program (UIP) recommending 3 doses, 4 weeks apart followed by 2 booster dose schedule; However, average diphtheria-tetanus-pertussis (DPT) vaccine coverage remains at only 84%.<sup>1</sup>

### Case History :

A 7 year old male child was brought to the casualty of a tertiary care teaching hospital of Karaikal, Puducherry in 2018 with chief complaints of acute onset of fever, sore throat, and dyspnea with odynophagia & whitish discharge from nose for 4, 3, and 2 days, respectively. The pattern of fever had changed from low grade and intermittent to high grade and continuous in the preceding 4 days. He was finding it extremely difficult to swallow both solids and liquids of late and had laboured noisy breathing. Hoarseness of voice has been noticed since 2 days. The child was repeatedly coughing and expectorating yellow-colored, non-foul-smelling, non-blood-stained sputum. As per the information given by his mother, the immunization status of this child was incomplete.

On general physical examination the child was conscious and oriented but looked toxic. He was febrile with a temperature of 101°F, heart rate of 110/min, respiratory rate of 52/min & O<sub>2</sub> saturation at room air was 75%. Inspiratory stridor was also present. No other abnormality was detected on systemic examination. Oropharyngeal examination revealed drooling of saliva & that the soft palate was congested with poor oral hygiene. There were greyish-white membranous patches on the medial aspect of both the tonsils which bled on attempted removal. Tonsils were hypertrophied (grade III) and uvula, soft palate, anterior pillar, and

posterior pharyngeal wall were congested and oedematous. Posterior pillar was not visible. Bilateral nasal membrane with serosanguinous discharge from the nose and excoriation of upper lip is seen.

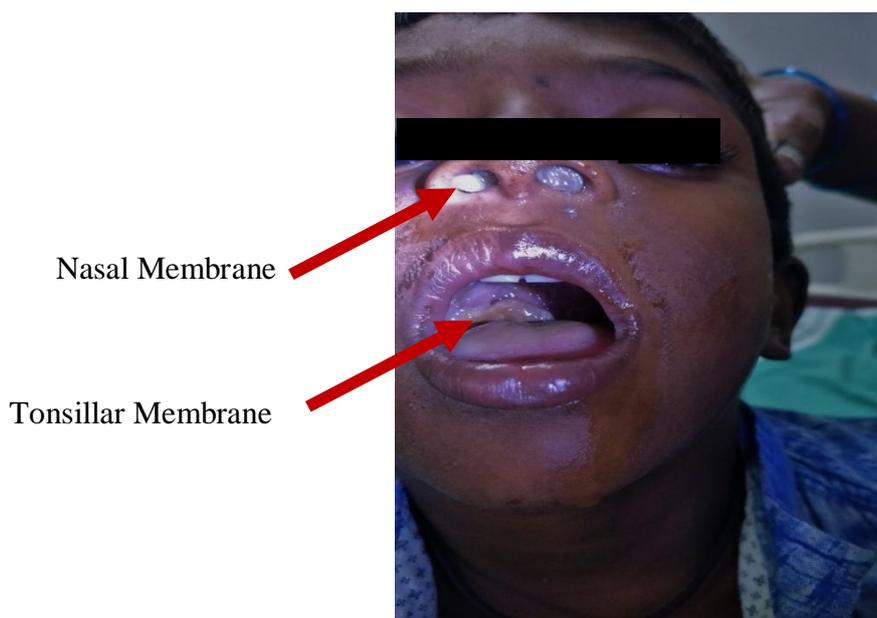


Fig 1. A 7 year old male child with Tonsillar & nasal diphtherous membrane

The child was diagnosed as a case of **Diphtheria With Tonsillar & Nasal Membrane**.

Owing to nonavailability of diphtheria antitoxin, the parents of this child were counselled about the grave prognosis of this disease, the child was started on IV Penicillin & was referred to JIPMER, Puducherry without much delay, where he was treated with antitoxin and antibiotics with which he improved symptomatically. The child was followed for 2 months and there was no recurrence.

Lack of awareness among primary care physicians, delay in clinical suspicion and requests for appropriate investigations are also key factors in mortality associated with such vaccine-preventable diseases. Diphtheria Anti Toxin is not readily available in all health facilities and its manufacture is also at a minimum. It has been suggested that this unavailability may be due to lack of awareness of the re-emerging status of the disease and a sense of false security on the immunization coverage as community-based screening of antibody titres against diphtheria has not been evaluated.<sup>2</sup>

It is important to understand DAT only neutralizes the circulating toxin and not that bound to tissues; thus, late presentations are closely linked to case fatalities.<sup>3</sup> Furthermore, early diagnosis is utmost important in preventing the rapid decline of diphtheria patients. Front line physicians and primary care providers are the key players in identifying early manifestations of faucial diphtheria, bacteremia, and toxemia, as initial penicillin therapy can halt disease progression.<sup>7,8</sup>

## II. Discussion:

Diphtheria, an acute bacterial infection in children has the potential of being eliminated through universal immunization program<sup>9</sup> Lack of awareness among parents regarding need for immunization against other diseases besides polio, incomplete knowledge of immunization schedule, fear of side effects are some of the reasons for not immunizing the children.<sup>10</sup>

Piggy backing on pulse polio campaign to increase the awareness and acceptability of immunization for other childhood diseases should be considered. Indian studies could be attributed to low booster coverage<sup>4,6,11</sup> and inclusion of booster dose coverage as a performance indicator of immunization program has been suggested.

Diphtheria outbreaks continue to be reported from India.<sup>4, 5, 6</sup> The microbiological confirmation is low due to early use of antibiotics, lack of expertise in sample collection etc.<sup>12, 13</sup>

Acute infection carries a high mortality and early initiation of antibiotics and DAT are essential to improve outcome. However, shortage of DAT has been reported from India and other developing countries.<sup>14, 15</sup>

### III. Conclusion :

Poor immunization coverage, failure to take booster doses, and absence of data regarding coverage of booster doses of Diphtheria, Pertussis, and Tetanus vaccine are some of the factors responsible for persistence or possible re-emergence of this infection in our country.

Because antibiotic therapy can only eliminate the infection but not reverse the effects of the diphtheria toxin, making diphtheria antitoxin readily available at health-care centres is the need of the hour. Adequate immunization with emphasis on taking booster doses along with generation of high-quality data on coverage of DPT vaccination as per UIP will go a long way in eliminating this dreaded infectious disease.

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