Late Presentation of Post Diphtheritic Myocarditis in a 15-year Male

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ABSTRACT

A 15-year old male patient presented to us with dyspnoea for four days. He had a history of fever, pseudo-membranous tonsillitis and cervical adenopathy twenty-five days prior to the presentation. On examination and laboratory investigations, he had features suggestive of myocarditis with biventricular failure. There was no reliable history of immunisation and he had a positive history of contact. He was planned for anti-diphtheria toxin but before the anti-toxin could be initiated, the patient succumbed to refractory cardiogenic shock. This was a rare case of late onset diphtheritic myocarditis in an unimmunised adult. With the advent of universal immunisation, there has been a significant decline in the incidence but there is still some road to cover.

Keywords: *Corynebacterium diptheriae; diphtheria; myocarditis.*

INTRODUCTION

Diphtheria is a potentially fatal infectious disease that predominantly affects children under the age of five. There has been a global decline in the number of diphtheria cases reported annually. The major cause of fatality in diphtheria is myocarditis that usually presents 1-2 weeks after the onset of acute symptoms.

We report a case of diphtheritic myocarditis presenting unusually late in an adult with questionable immunisation history. We present this case to highlight the possible rare manifestations of a forgotten vaccine preventable disease and the need for continuing efforts towards increasing the coverage of vaccination programmes.

CASE REPORT

A 15-year old male patient, resident of Uttar Pradesh was apparently asymptomatic one month back, when he developed sudden onset of fever, sore throat, and dysphagia and generalized neck swelling. He was taken to a local physician where he was informed that his tonsils were enlarged and were covered by a whitish membrane. He was prescribed local antibiotics after which his symptoms reportedly improved. Twenty-five days later he started having palpitations, shortness of breath and chest discomfort. After four days of worsening symptoms, he presented to our emergency department. A reliable vaccination history was not available. There was significant history of contact with a family member who suffered from similar complaints. This individual however recovered without any complications.

Physical examination revealed bipedal oedema, raised jugular venous pulsations, tachycardia, tachypnoea and hypotension. On systemic examination, he had minimal bilateral tonsillar enlargement, gallop rhythm (S3 present) and tender hepatomegaly.

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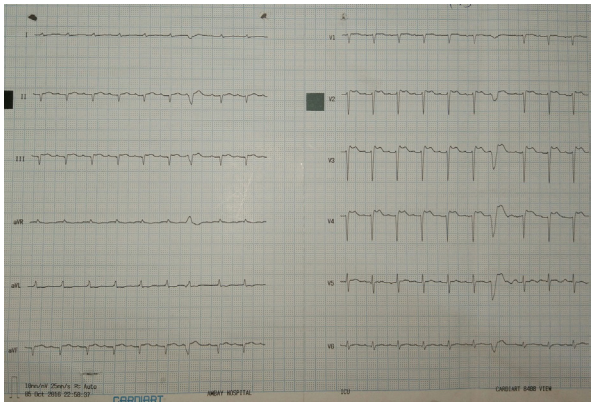

Figure 1. Electrocardiogram showing sinus tachycardia, right axis deviation, poor R wave progression and global ST/T changes.

Ultrasonography of the abdomen revealed gall bladder oedema, bilateral pleural effusion and mild ascites. Electrocardiogram (ECG) showed sinus tachycardia, right axis deviation, poor R wave progression and global ST/T changes (Figure 1). Trop I levels were 0.63 mcg/ml (0.01-0.023). NT Pro BNP (N terminal Pro Brain natriuretic peptide) levels were 25600 ng/ml. Bed side Echocardiography revealed global left ventricular dysfunction and Left ventricular ejection fraction of 20%. A diagnosis of probable faucial diphtheria according to WHO case definition was made. Two throat swabs were collected from the patient. One swab was used to make a gram stain and an Albert stain which turned out to be negative for Gram positive bacilli. The other swab was inoculated in Loeffler serum slope (LSS), blood agar and Potassium tellurite agar. None of the culture media showed any growth suggestive of Corynebacterium diphtheriae. The patient was started on dopamine, norepinephrine and erythromycin. He was planned for anti-diphtheria toxin but before the anti-toxin could be initiated, the patient succumbed to refractory cardiogenic shock. The close contacts were also advised erythromycin. Vaccination was advised for the patient's siblings. A post mortem diagnosis could not be made as the attendants refused to give consent for autopsy.

DISCUSSION

There has been a steady decline in the number of diphtheria cases reported from the developed world with occasional reports of small outbreaks. In the developing world, the major burnt of the disease is borne by India. In a study conducted by National centre for disease control, New Delhi, 218 samples were positive by culture out of the 941 samples received from various hospitals in northern India. The highest number of cases was reported from the states of Haryana followed by Uttar Pradesh and Delhi.[1] The high number of cases and associated mortality reported from India is probably due to inadequate vaccination coverage, poor socio-economic status and low supply of anti-diphtheria toxin. Most of the cases of diphtheria are reported in unvaccinated children but cases in adults are also reported in recent times due to fading immunity as the percentage of protective antibody decreases with increasing age. India implemented Universal immunisation programme in 1985 which follows the WHO recommendation of vaccination for diphtheria at 6, 10 and 14 weeks of birth followed by booster doses at 16-24 months and 5 years of age. The vaccine efficacy for 3 doses is 95-98% and 90-99.9% for 5 doses.[2] According to WHO, 86% of infants in 2015 worldwide received three doses of diphtheria vaccine. According to National Family Health Surveys, India, diphtheria vaccine coverage during 2002-2013 was 58-72% while the booster dose coverage was 41.4%.

Myocarditis can be detected in up to third of the patients but only up to 10-25% of patients develop clinical significant disease.[3] Myocarditis has been reported in 16-66% of diphtheria cases from India.[4,5] Myocarditis may present acutely with congestive failure and circulatory collapse or after 1-2 weeks of illness with dyspnoea, cardiac dilation and gallop rhythm. ECG changes include ST-T changes and heart blocks and studies point that patient with ECG changes have a very high mortality.[6] The presentation in our case was unique as myocarditis presenting 25 days after initial presentation is a rare event. In a recent study by Kole et al. from West Bengal, out of 200 cases of diphtheria, 128 had asymptomatic myocarditis but only 8 patients had myocarditis with heart failure. The average time for the development of myocarditis was 1 week.[7] In a study from Andhra Pradesh, the frequency of disease and complications were higher in the unimmunised children compared to the unimmunised children.[8] Although a vaccination history was unavailable for our patient, the poor socioeconomic status, significant family history and severity of illness indicates that the patient was probably unimmunised.

The treatment of diphtheria includes antibiotics for the eradication of organism prompt initiation of anti-toxins to neutralise the already released exotoxins.[9] In our case, the patient probably received antibiotics at the time of acute presentation; however it is unlikely to have targeted the toxins liberated in the blood as evidenced by the myocarditis that developed later in the course of illness. When the patient presented to us, although it was already late for toxin administration, we did plan to administer anti-toxin to take care of any unbound toxins in blood.

Diphtheria is a vaccine preventable disease and any death in this era due to lack of vaccinationis unfortunate. Even

though, cases are reported in vaccinated individuals due to waning of immunity, fatality is a rare event in such cases. The lack of awareness amongst primary care physicians and the unavailability of anti-toxins further complicate the issue. We report this case to emphasize that the goal towards universal immunisation is yet to be achieved and diseases that are considered a thing of the past may surprise us with unusual and fatal presentations.

Conflict of Interest: None.

Consent: JNMA Case Report Consent Form was signed by the patient and the original is attached with the patient chart.

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