



A Diphtheria Patient With Multiple Complications: A Case Report On Favourable Treatment Outcome, Kano State, Nigeria

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INTRODUCTION

- Diphtheria is a vaccine preventable disease, caused by toxicogenic *Corynebacterium diphtheriae*. It is a serious bacterial infection, usually affecting the mucous membrane, heart, kidneys, haematological and nervous systems, and rarely the skin.
- The experience gained from this case highlights the needs and possibility of multi-disciplinary/speciality approach in the management of diphtheria cases with multiple organ involvement in resource-limited settings.
- In December 2022 the Kano State Ministry of Health declared an outbreak of diphtheria, which was raging as at the period of the case report (October 2023), with 8721 confirmed cases and 367 deaths in the state and with more than 10,000 cases and 560 deaths recorded at national level at the time.
- MSF responded to the diphtheria outbreak by supporting a Diphtheria Treatment Centre (DTC) in Kano (see Image 1).



Image 1 - MSF supported DTC @ Murtala Muhammed Specialist Hospital, Kano Nigeria



Image 2 - Patient on the day of discharge – First hospitalisation

Readmission:

- The patient re-presented to the DTC 8 days after discharge from the first admission
- Symptoms included cough, vomiting, fever, inability to stand up and walk straight or to tolerate oral feeds (neuropathy), and weight loss. The assessment pointed to diphtheria re-infection.
- Patient received treatment with antibiotics, steroid, intravenous fluid, oral slow KCl for potassium of 2.3mmol/L, nasogastric tube feeding and oxygen therapy.
- The patient spent 13 days in readmission with steady improvement. He was discharged to a therapeutic feeding centre for nutritional rehabilitation and after discharge was to contact the clinic for diphtheria follow up.
- He was followed up weekly for two months and vaccinated 3 weeks after discharge from readmission (see Image 3).



Image 3 - Patient during follow-up visit after readmission discharge

CASE DESCRIPTION

- A 7-year-old boy, severely malnourished, presented to the DTC with 6-day history of upper respiratory tract symptoms (fever, sore throat, difficulty swallowing, swollen neck, voice change).
 - Upon examination, a thick oropharyngeal membrane was observed which confirmed the clinical diagnosis of *C*-diphtheria.
 - The patient had history of contact with a confirmed case and was not vaccinated for diphtheria.
 - The patient was placed on Diphtheria Antitoxin (DAT), antibiotics, steroids, analgesics and nasogastric feeding.
- Day 1 into admission, full blood count revealed a platelet count of 82x10⁹/L, and asymptomatic thrombocytopenia was diagnosed.
 - The patient was noted to have reduced urine output (not quantified), and mild facial puffiness on the 8th day of admission. Lab results showed a creatinine of 116µmol/L and urea of 18.3mmol/L. Acute Kidney Injury was suspected. The patient was placed on oral rehydration solution (to optimise hydration and support renal function), furosemide, and input and output monitoring.
- Day 11 into admission patient noticed to be pale and lethargic, in mild respiratory distress with pulse rate of 60bpm, weak volume and blood pressure of 60/40mmHg. This assessment confirmed cardiogenic shock.
 - The patient was placed on a dopamine infusion to optimise renal perfusion and enhance cardiac output.
 - A few hours later, the patient developed carpopedal spasms. Lab results showed electrolyte imbalance (Ca²⁺ 6.1mmol/L, K⁺ 2.9mmol/L). He was placed on IV calcium gluconate, and oral potassium chloride (KCl). Following administration of the above medications, symptoms resolved accordingly.
 - On the 13th day of admission, patient noted to be pale, in respiratory distress with enlarged tender hepatomegaly, which concluded an anaemic heart failure (Hb 7.0mg/dl). The patient received blood transfusion, resulting in a gradual but notable improvement in his condition.
- At Discharge (see Image 2):
 - The patient tolerated food with mild difficulty swallowing, urine output improved, cardiac exam was normal with a heart rate of 92bpm and SpO₂ was 100% on room air. Patient spent 22 days in hospital.
 - Overall, the patient improved and was discharged home.

DISCUSSION

The case underscores the importance of holistic medical care (paediatric, cardiac, renal, neurologic, haematologic etc) and early detection of complications, in managing severe diphtheria and its sequelae in paediatric patients. The narrative also emphasises the need for vigilance in discharge follow-ups, as evidenced by the patient's recurrence of symptoms. The multidisciplinary approach and timely interventions contributed to the overall improvement of the patient's condition.

ETHICS STATEMENTS

This case report adheres to ethical principles, ensuring patient confidentiality and informed verbal consent. Treatment decisions were made in the best interest of the patient, with due consideration for beneficence, non-maleficence, and autonomy. This poster was approved for submission by the WACA Medical Director.

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