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Case Report

An Unexpected Case of Measles

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Abstract

Outbreaks of measles in London and the South East have been reported recently despite relatively high vaccination rates. We describe the case of a 50 year old female with a delayed diagnosis of atypical measles who presented with respiratory symptoms, fever and a maculopapular eruption, who was treated for a community acquired pneumonia. Steroid and antimicrobial therapy was commenced and blood tests showed raised liver enzymes, inflammatory markers and lymphopenia. She developed a widespread maculopapular eruption which was suggestive of measles and confirmed through the presence of IgM antibodies. She was treated conservatively and made a full recovery. Our case highlights the importance of considering measles in patients presenting with a maculopapular rash and respiratory symptoms, as this can be consistent with a diagnosis of atypical measles.

Introduction

Public Health England data shows a steady increase in the number of measles cases over the past decade, with London historically having one of the lowest uptakes of MMR vaccine. Recent Outbreaks of measles in London and the South East were reported throughout 2016. Controversy since Andrew Wakefield's discredited and subsequently retracted 1998 paper [1] has precipitated a reduction in the uptake of the Measles, Mumps and Rubella vaccine (MMR). It therefore is important that measles in vulnerable populations should be a diagnosis which should be considered.

Case History

A 50 year old Caucasian female who was previously fit and well was referred to Accident and Emergency with a one week history of shortness of breath and cough. Prior to admission she was treated with oral co-amoxiclav for a suspected community acquired pneumonia, and trimethoprim for a urinary tract infection by her General Practitioner (GP). She had a past medical history of rosacea which was managed with lymecycline, and asthma controlled by inhalers.

On examination, she was pyrexic with a temperature of 39.7°C, tachypnoeic with a respiratory rate of 28 and hypoxic on air with saturations of 91%. There was also bilateral periorbital oedema. She was peripherally warm and vasodilated with a blanching rash on torso, arms, face and neck. Laboratory testing revealed abnormal liver function (ALT of 100 IU/l), elevated CRP (119 mg/L) and lymphopenia ($0.4x10^9$/L). On admission, Chest radiography was unremarkable and Computed Tomography Pulmonary Angiography (CTPA) showed bronchocentral airspace shadowing, and a widespread ground glass appearance with fluid tracking into the horizontal fissure. In view of these clinical signs she was treated for pneumonia with intravenous meropenem and clarithromycin. A dermatology opinion was sought due to the patient's facial oedema with conjunctival injection, and maculopapular eruption over the trunkand limbs. The rash initially developed over her face and chest which was thought to be an allergic reaction to co-amoxiclav previously prescribed. There was later trunk and lower limb involvement. The patient was subsequently treated with chlorphenamine and hydrocortisone. The Rash consisted of a widespread distribution of erythematous macules and papules. Despite treatment, the patient's temperature continued to spike for the first few days of admission and she developed diarrhoea lasting 2 days. A CTPA was arranged which excluded pulmonary emboli, and an Intensive Therapy Unit (ITU) consult was requested.

On the second day of admission one day after the onset of fever, the skin eruption started to desquamate and resolve with dusky erythema and purpuric areas noted over her back. A second dermatology opinion was sought, and a diagnosis of measles was suspected: given her continued hypoxia which persisted for a subsequent 6 days (despite maximal oxygen therapy); lymphopenia and the previous maculopapular and purpuric skin changes. However, there was no evidence of any Koplik spots and her vaccination status was unclear. She was isolated and serology was requested which subsequently confirmed a positive measles IgM. Public Health England was informed and the patient's contacts were traced. The patient subsequently made a full recovery without any further sequelae.

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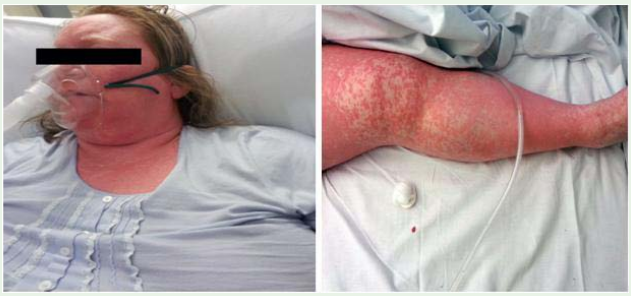

Figure 1: Maculopapular rash on the patient's face and lower leg.

Discussion

Measles is an airborne disease spread through coughs, sneezes, saliva and nasal secretions of an infected individual. Common differential diagnoses associated with infectious exanthemas include rubella, parvovirus B19 and roseola. The Measles virus is an RNA paramyxovirus that replicates within the endothelial cells of the respiratory tract, and spreads to lymphoid tissue leading to viraemia. Measles can be transmitted by an infected person from 4 days either side of the maculopapular eruption. The incubation period for measles is 10-14 days. The characteristic prodrome symptoms of measles include a high fever with the "3 C's" of Cough, Coryza and Conjunctivitis. Also commonly found and pathognomonic for measles are Koplik spots. These white papules are noted over the buccal mucosa which are usually present 1 day prior to the maculopapular eruption, and lasts 2-3 days. They are usually presented adjacent to the molars. The exanthema of measles develops over 2-4 days after prodrome and consists of erythematous macules and papules that begin on the forehead, hairline and behind the ear. It spreads in a cephalocaudal direction and persists for 5 days after which it either desquamates or fades. Immunosuppression is a significant complication of measles which can last for a number of weeks and lead to opportunistic bacterial infections like pneumonia. Pneumonia can be severe with pulmonary infiltrates, and optimal respiratory treatment is supportive, with some individuals requiring intensive care. Antibiotics are given prophylactically due to a high risk of secondary bacterial infection [2]. A definitive diagnosis is made through the presence of IgM antibodies against the measles virus.

Measles was first described by Rhazes, an Arab physician in the 9th century who distinguished the disease from smallpox in his treatise titled "On Smallpox and Measles". It was not until 1961 that John Franklin Enders and his team developed the first live measles vaccine through the use of live attenuated vaccines derived from the Edmonston Strain [3]. A licenced vaccine was introduced in 1963 with a refined version released 5 years later in 1968. 1988 saw the introduction of the combined MMR vaccine. In 1999 there was a public scare and decline in vaccination rates due to the publication of Andrew Wakefield's now discredited claim, causally linking the MMR vaccine, autism and bowel disease [4].

Measles outbreaks have become a cause of concern, with Public Health England detecting 20 cases in the South East and London region between February and March 2016 [5,6]. Most cases were in adolescents or adults who either did not receive the MMR vaccine or were not fully vaccinated. Nevertheless, uptake of the MMR vaccine is high, with 90% of children receiving their first dose of the vaccine before their second birthday in 2011 [6].

Our patient most likely presented with a case of atypical measles found commonly in those incompletely immunised against measles. It occurs in individuals given the old killed-virus measles vaccine (which did not provide complete immunity and was in use from 1963-1968) or patients that were given the attenuated live measles vaccine that was, by accident, inactivated during improper storage. The exanthema in atypical measles can be more prominent in the body creases and can be macular, haemorrhagic, petechial or urticarial.

Complications are more common in children under the age of 5 or adults over the age of 20. The complications include pneumonia which accounts for most measles associated deaths, encephalitis with seizures and altered mental state and diarrhoea. Most treatment in measles patients is supportive; however antibiotics can be prescribed in those individuals with infection. There is evidence to support high dose vitamin A in patients who are at a high risk of deficiency [7]. To achieve the WHO goal of eradication, it is imperative that high vaccination rates are achieved to maintain herd immunity, and the public are educated about the benefits of vaccination.

Conclusions

Whilst not a novel illness, the loss of awareness of measles due to widespread vaccination has significantly reduced the number of cases within England and worldwide. Nevertheless, controversy has led to a reduction in vaccine uptake with London having the lowest rate of MMR vaccination uptake in England. Atypical measles can present with nonspecific symptoms, and measles can be easily confused with adverse drug reactions. In patients presenting with a maculopapular exanthema, it is a diagnosis which should not be missed.

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