

# Fever, Coryza, Cough and Morbilliform Rash, Sounds Familiar? Measles in an Adult Omani Man with Relative Bradycardia

Kowthar Salman Hassan<sup>1\*</sup> and Shihab Khalid Al Kindi<sup>2</sup>

<sup>1</sup>Infectious Diseases Department, Sultan Qaboos University Hospital, Muscat, Oman

<sup>2</sup>Internal Medicine, Oman Medical Specialty Board, Muscat, Oman

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\*Corresponding author: kowhassan@gmail.com

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## ***Abstract***

Fever with sore throat and a rash may be caused by a wide range of infections, with or without antibiotic treatment. Measles is one such infection. However, this once prevalent infection has faded from public and medical awareness in some regions, which may lead to missing diagnoses and potential outbreaks. Here, we present an unexpected case of measles in an adult Omani man.

**Keywords:** Measles; Skin Rash; Co-amoxiclav; Bradycardia; Oman.

## **Introduction**

Measles, historically called the “first disease” due to its high incidence in children, is a highly infectious disease. While cases have significantly declined since the introduction of the measles vaccine in 1963, but disease persists and sporadic outbreaks are seen worldwide. This is largely due to the some parents refusing to vaccinate their children following the false link between the vaccination and autism.<sup>1</sup> No such negative impact on the vaccination rate, however, was observed in Oman. Consequently, our older generations are assumed to have natural immunity while the younger generation are expected to have been vaccinated. It is, therefore, unlikely that healthcare professionals may not readily consider measles in the differential diagnosis of fever and rash in adults. Here, we report a case of measles in a 43-year-old Omani man presenting with a typical morbilliform rash that proved to be measles.

## **Case Report**

A 43-year-old Omani man presented to the emergency department at Sultan Qaboos University Hospital with a one-week history of fever reaching 40 °C, headache, blurred vision, sore throat, generalized myalgia, and productive cough. He had visited a private clinic and was prescribed co-amoxiclav. Two days later, he developed a rash starting from his face and moving downward, accompanied by vomiting. He had returned from Dubai two weeks prior, and none of his family members were ill. He also had a history of raw milk consumption. Initial examination revealed a dehydrated man with temperature of 39.6 °C, oxygen saturation of 95% on room air, blood pressure of 134/82, heart rate of 69 bpm, and a respiratory rate of 18 breaths/min. He exhibited a non-blanching maculopapular (MP) rash on his forehead, chest, abdomen, and back. His arms, legs, and mouth were clear. The rest of the examination was unremarkable. Laboratory tests showed hemoglobin of 13.3 g/dL, platelets of  $122 \times 10^9/L$ , white cell count of  $4.2 \times 10^9/L$ , neutrophils of  $3.2 \times 10^9/L$ , CRP of 112 mg/L, ALT of 226U/L, AST of 90U/L, bilirubin of 5  $\mu\text{mol/L}$ , and alkaline phosphatase of 93 U/L. His chest X-ray was normal. At this point, the cause of his fever was not clear although brucella was considered (due to his raw milk consumption), and dengue and typhoid were considered because of low

platelet count and deranged liver function tests. The rash was assumed to be a drug eruption post co-amoxiclav. He patient received hydration and ceftriaxone overnight until further evaluation by the infectious diseases team. A thorough examination the next morning showed a morbilliform rash with characteristic distribution and examination of his mouth showed Koplik's spots. The patient also had resolving conjunctivitis [Figures 1 and 2].



**Figure 1:** Morbilliform rash on the back of a 43-year-old male.



**Figure 2:** Koplik's spots on the soft palate of a 43-year-old male.

Measles was suspected but upon asking the patient about any history of *hisba* (Arabic for measles), neither he nor his brothers recognized the word. The patient was immediately isolated in a negative pressure room and measles serology was requested along with urine PCR for measles and parvovirus. When measles IgM and IgG came back positive, we issued a public health notification, and the patient was prescribed vitamin A. The diagnosis was confirmed with positive urine measles PCR. The patient's Koplik's spots disappeared after two days and the rash

after four days. Blood cultures, dengue serology and PCR, and brucella serology were negative. Additionally, the patient was found to have previously undiagnosed diabetes.

## Discussion

Measles, caused by an ambisense RNA virus, is highly infectious, with an R0 value of 12–18.<sup>2</sup> In the pre-vaccine era, major epidemics used to occur every two-to-three years mainly in children below 15 years of age with an annual worldwide mortality of 2.6 million.<sup>3</sup> This case underscores several important diagnostic considerations and clinical observations. Blurred vision was attributed to conjunctivitis upon examination, and the rash was consistent with a morbilliform pattern typical of measles. Furthermore, the presence of cough, coryza, and fever strongly supported a diagnosis of measles. Notably, Koplik's spots, characteristic of measles, were observed in the patient's oral cavity.. Thorough examination of the mouth, palms/soles and genital areas is paramount in any fever with rash. Koplik's spots have been considered as pathognomonic for measles since their first description in 1896. Koplik's spots are described as white or gray spots on buccal mucosa.<sup>4-6</sup> As the rash erupts the Koplik's lose their characteristics and become more erythematous and discrete as seen in our patient.<sup>4</sup> Our patient had thrombocytopenia which has also been reported frequently in measles.<sup>7</sup>

Although measles IgM was positive in our patient, PCR was used to confirm the diagnosis due to potential cross reactivity with rubella virus, human herpes virus 6 (HHV6) and parvo virus, which has been reported previously.<sup>8</sup> Furthermore, false positive measles IgM has been reported in some cases of sore throat and a rash given antibiotics.<sup>9</sup> Our patient had positivity for both IgM and IgG. This could indicate a primary infection, reinfection, or a breakthrough infection post vaccination. Following a primary infection, both IgG and IgM antibodies develop between three to seven days of rash onset and antibodies then increase reaching a plateau two-to-three weeks later.<sup>10</sup> In other times the IgG might reflect a reinfection or a breakthrough post-vaccination. IgG avidity is used sometimes to differentiate between reinfection and breakthrough infection post-vaccination, however, it is not commercially available.<sup>11,12</sup>

This case also highlights the importance of obtaining vaccination history from patients presenting with fever and a rash. Measles vaccine was first implemented in Oman in 1981, one year after the birth of our patient (1980). Oman had a national campaign in 2017 to reboost measles immunity for those born after 1982, but our patient was not a candidate. Our population born before and after 1981 is, therefore, assumed to be naturally immune and post-vaccination immune, respectively. According to our patient's older sister, he and his younger brothers all had *hisba*. However, it has been noted that the word *hisba* (measles) may be confused sometimes with the word *muhmaiqa* (chickenpox). In addition, childhood exanthems may look very similar to each other. Tests for cytomegalovirus (CMV), EBV, and HIV were negative in this patient. It is likely that our patient had a non-measles exanthem in childhood, he was not vaccinated as he was born before 1981, and this was his primary infection. However, a reinfection cannot be excluded.

The patient had relative bradycardia (AKA Faget sign), which has not been reported in measles before. It refers to the lack of increase in the heart rate by 8–10 bpm for every one degree rise in body temperature above 38.3 °C.<sup>13</sup> It is usually seen in intracellular bacterial infection including salmonella and legionella, but not reported in viruses.<sup>14</sup> It is possible that the patient also had a bacterial co-infection that responded to ceftriaxone such as typhoid. Diagnosis of typhoid is usually based on positive blood cultures, stool cultures, or bone marrow culture, which is most sensitive. Blood cultures of our patient were negative, but blood culture sensitivity drops to 75% in week two which our patient was in at the time of his presentation.

The implications of this diagnosis are multiple including implementing the appropriate measures for infection control. The patient should be immediately provided with a face mask and isolated in a negative pressure room with a N95 face mask worn by attending healthcare workers. This applies even on those thought to be immune (naturally or post-vaccination). Two physicians developed measles despite having had two MMR vaccine doses before, and cases of reinfection have also been reported.<sup>15</sup> Also important here is contact tracing of all those the patient encountered four days before his rash started and four days afterwards. In addition, the source of his infection needs to be traced as well. Two weeks before his presentation he was in Dubai with his family. The incubation period of measles is usually 10–12 days but can range from 7–21 days making the chance of acquiring it in Dubai a possibility.

## Conclusion

This case underscores the importance of considering measles in the differential diagnosis of fever and rash in adults, even in regions with high vaccination coverage. Furthermore, it suggests a possible association between relative bradycardia and measles, although concurrent bacterial coinfection cannot be ruled out.

## Disclosure

The author declared no conflict of interest. Signed consent was obtained from the patient.

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