



Measles is an Important Disease to Recognize: Case Series

Tanınması Gereken Önemli Bir Hastalık, Kızamık: Vaka Serisi

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Abstract

Measles is a vaccine-preventable childhood disease with a characteristic rash. Our aim is to present patients diagnosed with severe measles who developed respiratory and nervous system complications and to increase the awareness of physicians on this issue. This is a descriptive observational study including a case series consisting of six cases. Clinical and demographic data of children diagnosed with invasive measles were studied retrospectively from their medical records. Informed consent was obtained from their parents. Six cases of measles, who were hospitalized with complications are presented. Five patients were unvaccinated and one had a single dose measles vaccine. All of the patients had a history of measles exposure. Two of the families were immigrants. One patient was three months old. In addition to pneumonia, two of the patients exhibited petechial rashes along with a maculopapular rash, while two other patients experienced febrile convulsions. This case series highlights the continued significance of measles as a disease, even in countries with high vaccination rates. These cases demonstrate that measles can lead to both respiratory and nervous system complications.

Keywords: Measles, children, vaccine, complication, seizure, pneumonia

Öz

Kızamık, karakteristik döküntülerle seyreden, aşıyla önlenebilir çocukluk çağı hastalığıdır. Amaç hastanemizde yatarak tedavi edilen ve solunum ve sinir sistemi komplikasyonları gelişen ağır kızamık tanılı hastaları sunmak ve hekimlerin bu konudaki farkındalığını arttırmaktır. Bu çalışma, altı olgudan oluşan bir olgu serisini içeren tanımlayıcı gözlemsel çalışmadır. Her bir olgunun demografik ve klinik özellikleri, hasta dosyalarından geriye dönük olarak değerlendirilmiştir. Olguların sunulabilmesi için hastaların ebeveynlerinden yazılı onam alınmıştır. Laboratuvar testleri ile kanıtlanmış altı komplike kızamık olgusu sunulmaktadır. Hastaların beşi aşısız biri tek doz aşıydı. Hastaların hepsinin kızamıklı bir birey ile temas öyküsü vardı. Aile içi temasları olan iki farklı göçmen aile vardı. Hastalardan en küçüğü üç aylıktı. İki hastanın makülopapüler döküntüye eşlik eden peteşiyal döküntüleri de bulunmaktaydı. Tüm hastaların pnömonisi vardı ve iki hasta basit febril konvülsiyon geçirdi. Bu olgu serisinde, kızamığın ülkemiz gibi aşılanmanın iyi olduğu ülkelerde dahi önemli bir hastalık olmaya devam ettiği görülmektedir. Aşısız ya da eksik aşı bu olgularda görüldüğü üzere, kızamığın solunum ve sinir sistemini de etkileyen, hastane yatışı gerektiren ciddi komplikasyonlarının olduğunu bilmek gerekir.

Anahtar Kelimeler: Kızamık, çocuklar, aşı, komplikasyon, nöbet, pnömoni

Introduction

Measles is a vaccine-preventable, highly contagious childhood disease. Generally, children under the age of five and young adults have more a severe clinical presentation. Measles typically manifests with an initial fever, followed by the development of a maculopapular rash that starts on the

face and then spreads to other parts of the body. Systemic involvement in measles can affect various systems, including the respiratory, digestive, and central nervous systems. These complications are the main reasons for morbidity and mortality associated with measles (1-3). The introduction of the measles vaccine has led to a substantial reduction in the incidence of the disease and associated mortality. However,

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a decline in vaccination rates has resulted in an increase in the number of measles cases (1-5). Physicians today may face challenges in diagnosing measles as it has become a rare disease in our country. It may be difficult to treat patients with systemic complications. Therefore, a case series comprising six patients diagnosed with measles who subsequently developed pulmonary and nervous system complications is being presented. This case presentation underlines the significance of accurate diagnosis in such cases.

Case Report

Clinical and laboratory data of six children (two girls, and four boys) requiring hospitalization are presented. Demographic and clinical data are given in Table 1. All of the patients had a history of contact with an individual with measles. There were two different immigrant families. In one of these families, five people, including four siblings and a nephew, were diagnosed with measles (Figure 1). The oldest one of this family was an 18-year-old, unvaccinated girl and she was the mother of an 8-month-old baby with measles (Case 3). The mother was the first family member to exhibit symptoms, and her child developed severe viral pneumonia, necessitating respiratory support. Case 4 was the other child in the same family who suffered from severe measles pneumonia. Two brothers, one three years old and the other four years old, were also diagnosed with measles, but they did not have any systemic involvement that required hospitalization. These two brothers were isolated at home. In the other family, only case 5 and case 6 had measles.

Serum samples and nasopharyngeal swab samples of all patients were studied in the Turkish Public Health Gaziantep

Laboratory. Serum samples were positive for measles immunoglobulin M (IgM) and nasopharyngeal swab samples were positive for measles PCR. Two out of the six patients were below the age recommended for the routine vaccination schedule. The 12-year-old patient had been vaccinated with a single dose at the age of 12 months. The remaining three patients had no vaccination.

All patients were hospitalized separately in single rooms with airborne isolation. Since there were no negative pressure rooms in the hospital, the rooms were constantly ventilated. Proper utilization of personal protective equipment (PPE) was enforced, and patient transportation and exit from the room were restricted to medically essential purposes.

Fever and maculopapular rash were the predominant presenting symptoms among all patients. All patients also had conjunctivitis, runny nose, and cough. The time elapsed between the onset of symptoms and admission to the hospital ranged from 12 to 72 hours. All patients had viral pneumonia.

Petechial rash, which is a rare finding of measles, was present in case 1 and case 2 (Image 1). Pneumonia and febrile convulsions developed in these two patients. Case 2, which was three months old, was intubated and followed on a mechanical ventilator. There was no growth in the blood cultures of both patients with petechial rash. Lumbar puncture could not be performed in case 1 as the parents did not give consent. The cerebrospinal fluid (CSF) findings of case 2 were within normal limits. No cell was detected on direct microscopic examination and CSF culture was negative.

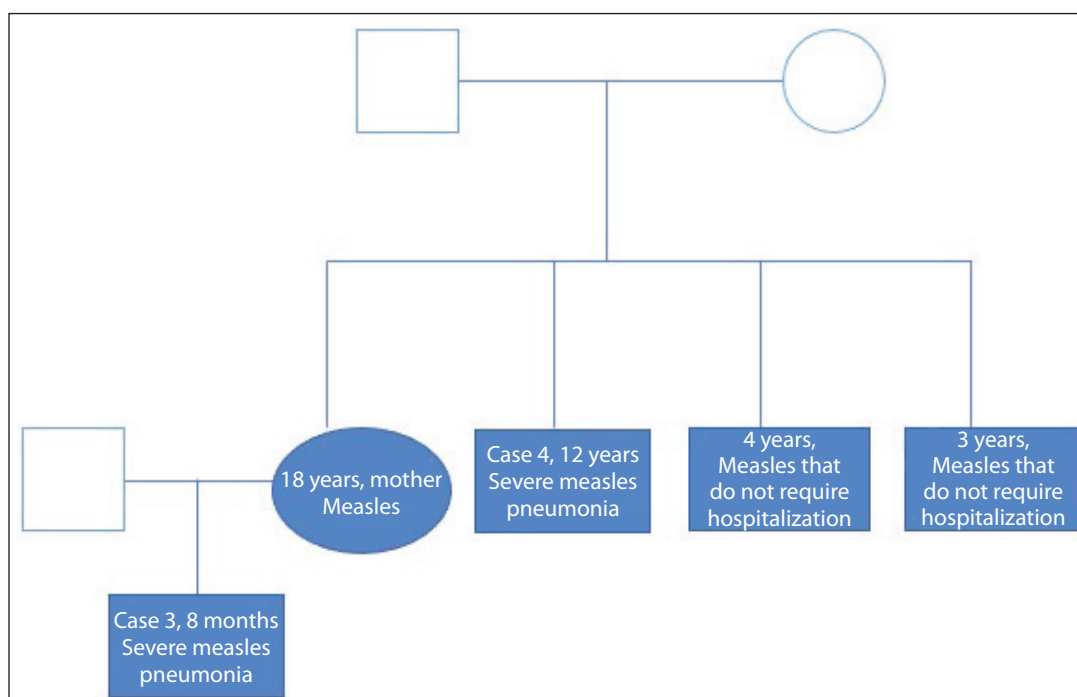


Figure 1. One of the immigrant families. Flow chart describing family members diagnosed with measles.



Image 1. Maculopapular and petechial rash.

Among the patients who developed viral pneumonia, case 2 was intubated and mechanically ventilated, while three patients received only oxygen support. Vitamin A supplementation was administered to all patients for two consecutive days, with the dosage tailored to their age and weight. Among the four patients diagnosed with severe pneumonia, there was no clinical improvement despite receiving supportive treatment and vitamin A supplementation. Additionally, their fever persisted for more than five days. These patients continued to have persistent fever, with body temperatures measured every two hours consistently remaining above 38 °C. Due to the ongoing fever and worsening respiratory distress, a single

dose of intravenous immunoglobulin (IVIg) support was administered at a dosage of 400 mg/kg. Ribavirin could not be administered as it was not available.

A significant observation was that an 8-month-old infant, whose mother had measles, and a 12-year-old cousin exhibited more resistant fever, more severe pneumonia symptoms, and required respiratory support compared to their other siblings. Body temperatures, which were monitored every two hours, consistently remained above 38 °C. Patients 1 and 4 had severe lymphopenia (Table 1). The C-reactive protein values (CRP) of the patients were within the normal range.

Table 1. Demographic and clinical characteristics of patients with measles

	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Gender	F	M	M	M	F	M
Age	17 months	3 months	8 months	12 years	14 years	17years
Vaccination status	No	No	No	Single dose	No	No
Positive case within family	No, but neighbour +	No, but neighbour +	Yes ^a	Yes ^a	Yes ^b	Yes ^b
Symptoms						
Fever	Yes	Yes	Yes	Yes	Yes	Yes
Conjunctivitis	Yes	Yes	Yes	Yes	Yes	Yes
Rhinorrhea	Yes	Yes	Yes	Yes	Yes	Yes
Cough	Yes	Yes	Yes	Yes	Yes	Yes
Skin eruption						
Maculopapular	Yes	Yes	Yes	Yes	Yes	Yes
Petechiae	Yes	Yes	Yes	Yes	Yes	Yes
Laboratory (/mm ³)						
Leucocyte	2600	10.800	9000	5100	7100	5000
Lymphocyte	500	5700	5200	500	1300	1100
Neutrophil	1400	3600	3200	4400	5200	3100
Platelet	94.000	342.000	222.000	291.000	174.000	171.000
Complications						
Pneumonia	Yes	Yes	Yes	Yes	Yes	Yes
Sepsis	Yes	Yes	No	No	No	No
Convulsion, status	No	Yes	No	No	No	No
Respiratory support	Oxygen	MV	NIMV	HFNC	Oxygen	Oxygen
Length of hospital stay, day	18	13	12	8	7	10

HFNC: High flow nasal cannula oxygen support, NIMV: Non-invasive mechanical ventilation.

^aCase 3 was the nephew of case 4. The unvaccinated 18-year-old mother of case 3 was the sister of case 4 and they have 2 other siblings diagnosed with measles, but they did not need hospitalization (5 cases had measles in a family) (Figure 1).

^bCase 5 and case 6 are siblings.

All patients were discharged, and there were no reported cases of mortality. One patient with febrile convulsions needed to continue antiepileptic therapy.

Discussion

Although measles is a vaccine-preventable disease, it remains the leading cause of child mortality worldwide and causes epidemics among populations with low vaccine coverage (1,6,7). Since the diagnosis of the disease is primarily clinical, it is very important for pediatricians to know about rare measles-related infections. To draw attention to this issue, cases with severe clinical findings and complications were presented.

Complications of measles often occur in children under five years and young adults, as well as in pregnant women and people who are immunocompromised or with malnutrition (1,2). Although many different organ systems can be affected, the respiratory system and gastrointestinal tract are most commonly affected (2,4). Seizures and meningoencephalitis were also reported in the acute phase of the disease in the pre-vaccine years (8). Neurological complications of measles are rare but can cause serious disability and death (1,2). Acute disseminated encephalomyelitis (ADEM) may develop shortly after the measles infection, and measles inclusion body encephalitis can occur 8-12 months following the disease (2,4,8). Years later, subacute sclerosing panencephalitis (SSPE), a fatal complication, may occur in individuals who had measles at a young age (2,4,8). Due to all these serious complications, it is important for physicians to know the detailed evaluation of patients at risk. These cases are presented to draw attention to serious complications.

It has been documented in the literature that petechial rash may rarely accompany measles (1,9). Given that these patients exhibit distinctive symptoms such as petechial rashes along with neurological complications, this clinical presentation was highlighted. Secondary bacterial infections should also be noted. Therefore, it is recommended to perform additional tests to exclude bacterial infections.

The 8-month-old infant and the 12-year-old child experienced a more severe form of the disease compared to their relatives who were three and four years old. The absence of vaccination in the case of this infant, coupled with continuous close contact with the infected mother and the lack of protective antibodies from the unvaccinated mother, contributed to the more severe disease outcome (1,4).

Several factors have contributed to the rise in the percentage of unvaccinated individuals in developed countries. These factors include vaccine hesitancy, interruptions in routine child healthcare visits during the COVID-19 pandemic, the presence of immigrants from regions with healthcare system

challenges, and the effects of climate change (6,7,10,11). All of our cases were immigrants. The location of our hospital in a region affected by the devastating earthquake that impacted Türkiye and Syria in February 2023, along with factors such as shared living spaces, the presence of unvaccinated immigrants, and population mobility, has made it challenging to register and monitor cases. This could be a contributing factor to the rise in measles cases.

In conclusion, this report provides a case series of measles with complications, emphasizing that systemic complications can be a significant contributor to both mortality and morbidity. Therefore, accurate diagnosis and appropriate management are crucial for ensuring survival.

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