

Fever and rash in an 11-month-old girl

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Case Summary

An 11-month-old girl presented with a 3-day history of high fever, irritability and decreased appetite. However, there was no coryza, cough, diarrhoea or fits. On the third day, a generalised erythematous rash appeared after the fever subsided abruptly. The rash was pinkish in colour, non-pruritic and discrete, which initially started on the trunk and later spread to the face, neck and extremities within 2 days. On further questioning, she was found to be appropriately immunised for her age according to the Ministry of Health's immunisation schedule. No similar illnesses existed in her family and the nursery she attended.

On examination, the infant appeared well, with a normal body temperature of 37°C and stable vital signs. A generalised erythematous maculopapular rash was observed extending from the head to her legs, which blanched with pressure. Involvement of the buccal mucosa was absent, with no palpable lymph nodes. She was prescribed paracetamol syrup regularly and care givers advised to maintain her hydration. The child remained well and active throughout the course of the illness. The rash subsequently subsided within a couple of days.



Figure 1. Erythematous maculopapular rash on the face and limbs

Questions

1. What is the most likely diagnosis?
2. What are the differential diagnoses?
3. What are the relevant investigations to be conducted?
4. What is the management?
5. Is there a need to notify the health authorities about this condition?

Answers

1. The most likely diagnosis for this presentation based on the clinical history and characteristic of the rash is roseola infantum or exanthema subitum. The characteristic of this condition is that the

infant is febrile for 3 to 5 days with high body temperature that abruptly subsides with the emergence of a typical rash. The rash is macular or maculopapular in nature, starting from the neck and trunk and spreading to the face and limbs, as in this child. The rash also blanches with pressure, and usually clears up within 2 days.¹⁻³ While 93% of affected infants are symptomatic (fever, fussiness, rhinorrhoea), only 20% of those infected exhibit the rash of roseola.^{2,5} In Asian infants, Nagayama spots (ulcers at the uvulopalatoglossal junction) can be observed.^{4,5} However, in this child, no uvulopalatoglossal ulcers were noted. Also, 4% of affected children are reported to develop seizure during the febrile phase.⁵

- The key feature of roseola is a rash presenting after the resolution of fever. It has been documented that by 2 years of age, 90% of children are infected, with a peak incidence occurring between 9 and 21 months of age.^{5,6} Also known as the sixth disease, it is caused by human herpesvirus-6 (HHV-6). The exact mode of transmission of HHV-6 is yet to be established; it is presumed to be transmitted via the saliva of asymptomatic individuals to susceptible infants.^{5,6} Only 1% of HHV-6 infection is acquired congenitally, without known sequelae.^{5,6}
- Several differential diagnoses can be made pertaining to fever and rash in children. As differentiating a rash in children is difficult based on appearance alone, it is very important that physicians should be able to recognise the characteristics of a rash to narrow down the possible diagnoses and aetiologies. Consideration should be made on the appearance and site of rash, associated symptoms and the clinical course. In this case, measles can be one of the differentials in view of the child's age and the duration of the fever. However, there were no accompanying symptoms such as cough, coryza and conjunctivitis. Measles can also be distinguished by the presence of Koplik's spots in the oral mucosa.¹ Other diagnosis may include rubella in view of the characteristic pink macular rash. In rubella, prodromal features such as fever and malaise are usually absent in children. The rash of rubella starts on the face, spreading downwards to the trunks and fading completely on day 3.⁷ However, it causes less severe symptoms, and its exanthem typically has a shorter duration (2–3 days).¹ Other common infectious conditions in children include erythema infectiosum and scarlet fever.^{1,2} However, erythema infectiosum, which is caused by human parvovirus B19, primarily affects older children between 3 and 12 years of age, and is usually accompanied by a viral prodrome followed by the "slapped cheek" facial rash.⁷ The distinguishing feature of scarlet fever is that the rash typically starts from the upper trunk and then spreads out to the entire trunk, sparing the palms and soles, along with desquamation of the extremities after the rash fades.⁷
 - For classic roseola infection, laboratory investigation is seldom required,⁴ as the diagnosis is made based on the signs and symptoms. However, if the child presents with complications such as febrile seizures, laboratory work up is necessary, which may include a full blood count, urinalysis, blood culture and cerebrospinal fluid examination. The illness can be confirmed with virus isolation or detection of viral DNA sequences in peripheral blood mononuclear cells.⁷
 - As for the management of this condition, only supportive treatment such as antipyretics and frequent hydration is required, as most of the cases are self-limiting.^{4,7,8} Since transmission of this disease is through saliva, standard hygienic measures such as frequent and thorough hand washing is important to prevent the spread of infection.⁴ The exact period when an infected child is contagious is unclear, but it most likely spreads during the febrile phase of the illness when there are no noticeable signs that the child is infected with the virus. In addition, there is no recommended period of isolation for a child with roseola.^{4,8} However, it is best to keep the sick child at home during the febrile phase for close observation in addition to infectious control in day care centers.
 - Roseola infantum does not need to be notified because it is benign and self-limiting. In Malaysia, hand, foot and mouth disease and measles are the childhood communicable diseases that need to be notified within 24 hours and 48 hours, respectively, in order to prevent outbreak to other children.^{9,10} This is important for surveillance as there are children who have not been vaccinated as scheduled.

Conflict of interest

None.

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