



Fever and rash in children

Dr mostafavi N

Departement of pediatric infectious disease
Isfahan University of Medical Sciences

Introduction

- ▶ Many disease have cutaneous findings(infectious, allergic, rheumatologic, skin, ...)
- ▶ Difference in age, type of rash, distribution of rash, other findings such as fever, and course of disease guides to the diagnosis
- ▶ Wide spectrum of findings
- ▶ At the end of this class You should know the common causes and the important notes in the diagnosis of fever and rash

Types of Rash

- ▶ Vesicular
- ▶ Petechial
- ▶ Urticarial
- ▶ Maculopapular
 - Morbiliform
 - Rubelliform
 - Scarlatiniform
 - Erythema multiform
 - Nonspecific

Fever and vesicular rash

- ▶ Chicken pox
- ▶ Hand foot mouth disease
- ▶ Insect bite and other infection

Chicken pox

- ▶ History of exposure ۱۴-۱۶ days ago
- ▶ Croups of macula, papula, vesicule, pustule, and crusted papula in ۴ days
- ▶ Mostly on face, head, neck, trunk; and proximal extremities
- ▶ Severe pruritis
- ▶ Fall of crusts within ۱-۲ wks. and temporary hypopigmentation



Chicken pox



Chicken pox



Hand foot mouth disease

- ▶ Coxsackievirus A serotypes
- ▶ Fecal oral rout
- ▶ Usually no or mild fever
- ▶ Macules and vesicles on faucial pillars, tongue, buccal mucosa and sometimes gingiva, and lips
- ▶ Macules, papules and vesicles 1-5 mm on the hands, feet, buttocks and upper thighs
- ▶ Sometimes painfull
- ▶ Resolve in about 3-4 d.



Hand foot mouth disease



Fever and petechia

- ▶ Meningococccemia
- ▶ Enteroviral infections
- ▶ Pressure petechia
- ▶ Henoch–shoenlein purpura

Meningococccemia

- ▶ *Neisseria meningitidis*
- ▶ Petechia mostly on trunk, lower portion of body, soft palate, and palpebral conjunctiva
- ▶ Rapid progression to purpura and ecchymosis within 6 hrs.
- ▶ Generally ill, hypotensive and meningeal signs
- ▶ Abnormal CBC, CRP, PT, PTT, BS, VBG



Meningococccemia



Viral petechia

- ▶ Enteroviruses, respiratory viruses, measles, EBV, CMV, parvovirus
- ▶ Nonprogressive, mostly on face and upper trunk
- ▶ Well-appearing with normal vital signs
- ▶ Normal CBC, CRP, BS, ABG, and Coagulation tests



Henoch-Schönlein purpura

- ▶ Age 3-10 yr.
- ▶ Symmetrical crops of petechiae, palpable purpura, and ecchymosis in pressure dependent area and buttocks
- ▶ Palpable purpura+ arthritis/ abdominal cramp /proteinuria or hematuria / suggestive biopsy
- ▶ Localized subcutaneous edema in dependent and periorbital areas
- ▶ Sometimes fever
- ▶ NL CBC, PT, PTT



Henoch-Schönlein purpura



Cutaneous small vessel vasculitis

- ▶ Palpable purpura/petechial, fever, urticarial, arthralgia, lymphadenopathy, \downarrow C γ & C ϵ , and \uparrow ESR
- ▶ 7-10 (2-14) d. after drug
- ▶ Antibiotics, NSAIDs, cardiac drugs, diuretics, anticoagulants, cancer chemotherapy agents, and psychoactive drugs
- ▶ Improve in days to weeks after discontinuation of drug, sometimes need NSAIDs or corticosteroids



Cutaneous small vessel vasculitis

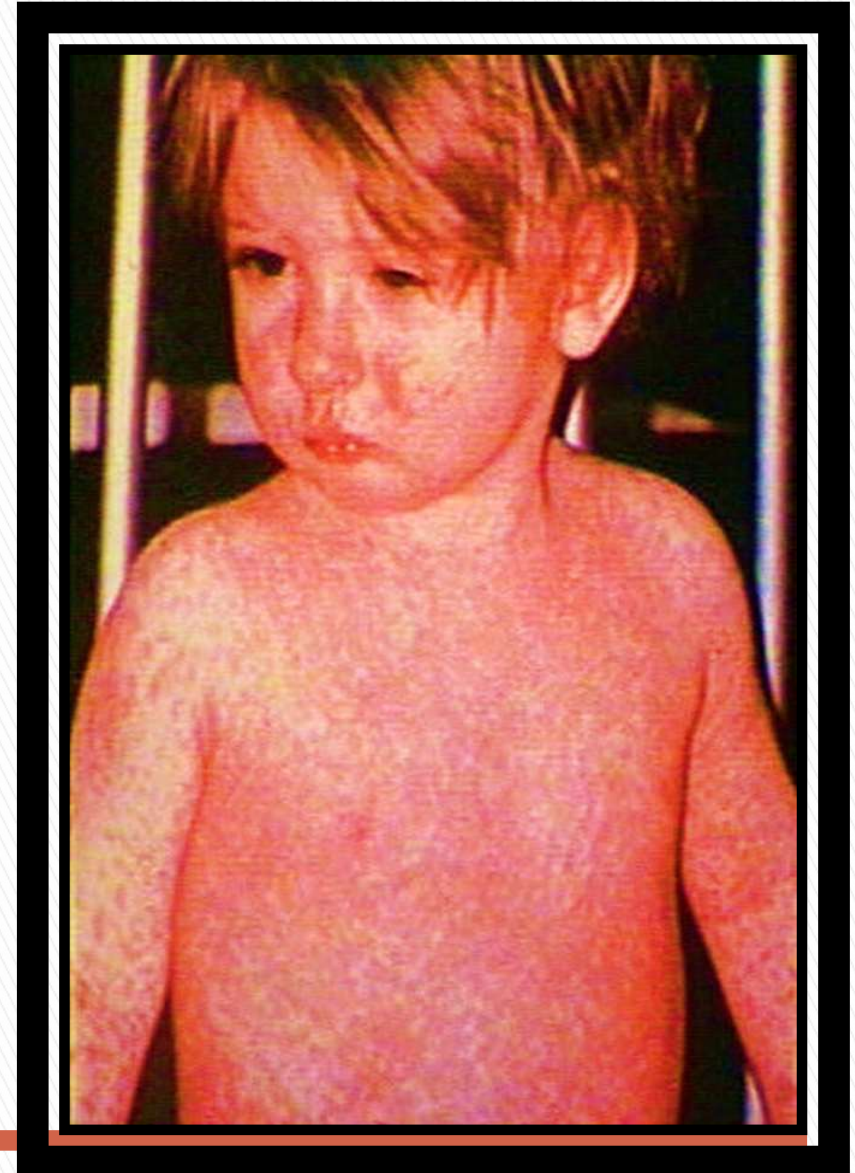


Fever and morbiliform rash

- ▶ Measles
- ▶ Drug eruption
- ▶ Other viral diseases with severe rash
- ▶ Kawasaki disease

Measles

- ▶ Incubation: 6-21 day
- ▶ Unvaccinated child
- ▶ 1ST stage (2-4 d): fever+ cough, conjunctivitis, coryza+ koplic spot
- ▶ 2nd stage: high fever (3-4 d.) +erythematous maculopapular confluent rash on face then neck, upper trunk, lower trunk and extremities, sparing palms and soles for 2-4 d.
- ▶ 3rd stage: darkening and brownish color of rash then fade and fine desquamation after 6-7 days
- ▶ Continue of cough for 1-2 wks.



Koplic spot:

Gray-white, sand grain-sized dots on the buccal mucosa opposite the lower molars



Drug reaction with eosinophilia and systemic symptoms (DRESS)

- ▶ Extensive maculopapular and coalescing erythematous rash on face, trunk and extremities, sometimes pruritis
- ▶ Fever, malaise, lymphadenopathy, sometimes visceral involvement(liver, kidney, lung)
- ▶ ۲– ۶ wks. After the initiation of drug
- ▶ Antiepileptics, Allopurinol, Antibiotics



Shirley G. Hammond et al. (2013) 100-105

DRESS



Fever and rubelliform rash

- ▶ Rubella
- ▶ Roseola
- ▶ Erythema infectiosum
- ▶ Enteroviruses rash
- ▶ Kawasaki disease

Rubella (۳-day measles)

- ▶ Eliminated after vaccination
- ▶ ۲-۳ wks. after exposure in unvaccinated individuals
- ▶ Pin point maculopapular rash on face then trunk then extremities
- ▶ Disappearance after ۳-۵ d.
- ▶ Posterior occipital lymphadenopathy
- ▶ Low grade fever
- ▶ Sometimes mild conjunctivitis and small red spots on soft palate (Forchheimer)



Erythema infectiosum (Fifth disease)

- Parvovirus B19, mostly 5-15 yr
- Infectious phase: fever, malaise, myalgias, and headache, Aplastic crisis in hemolytic anemias, for 7-10 d
- Post infectious phase (fifth disease): 7 to 10 d. after infectious phase)
- Fever, coryza, diarrhea
- 2 stage rash in 1-2 weeks:
 1. Fiery red rash on the cheeks (slapped-cheek appearance)
 2. Symmetric, maculopapular, truncal rash after 1-2 days on trunk and extremities
 3. Fading of rash as central clearing and a lacy, reticulated rash for 1-2 wks (mean, 11 d)
- Sometimes recurrence of rash with exercise, bathing, rubbing, or stress
- mildly pruritis, No desquamation, Often no fever, Sometimes arthralgia, arthritis



Fifth disease



Roseola infantum (exanthema subitum)

- ▶ Human herpes virus 6 & 7
- ▶ Peak age: 6-12 mo., mostly <2 yr.
- ▶ Transmission by saliva of asymptomatic adults
- ▶ 3 stages:
 - Abrupt high fever (>40°C) + fussiness + occipital lymphadenopathy for 3-5 d.
 - Abrupt resolve of fever
 - Rose-colored faint pink rash on neck and trunk then on face and extremities for 1-3 d.
- ▶ Sometimes eyelid edema, uvulopalatoglossal junction macule (Nagayama spots), bulging fontanelle, upper respiratory or gastrointestinal symptoms during fever
- ▶ Leukopenia, neutropenia, thrombocytopenia, sterile pyuria



Roseola infantum



Enteroviruses

- ▶ More than 90 serotypes
- ▶ Sometimes fever 1-2 d.
- ▶ Generalized maculopapular, sometimes urticarial rash sometimes after decline of fever



Infectious mononucleosis

- ▶ Epstein barr virus
- ▶ Older children and adolescence
- ▶ Fever, exudative pharyngitis, cervical lymphadenopathy, snoring, splenomegaly,
- ▶ Maculopapular rash on trunk and sometimes extremities especially after penicillins



Scarlatiniform rash

- ▶ Scarlet fever
- ▶ *Arcanobacter hemolyticum* infection
- ▶ Kawasaki disease

Scarlet fever

- ▶ Erythrogenic toxin of streptococcus group A(> 20 serotypes)
- ▶ Mostly in 5-15 yr.
- ▶ High fever+ Sand-paper like (fine papular that fade on pressure) on neck the trunk and extremities for 5-7 day
- ▶ Exudative or erythematous pharyngitis, White then red strawberry tongue, Pastia sign (accentuated rash on elbow, axilla, and groin), cervical lymphadenopathy
- ▶ Desquamation period : 1-3 w, from face then downward, sometimes sheet like in palms and soles
- ▶ Treatment : benzatine penicillin G
- ▶ Complications: Acute rheumatic fever, Post streptococcal glomerulonephritis



Scarlet fever



Arcanobacter hemolyticum

- ▶ Gram negative rod
- ▶ Adolescents and young adults
- ▶ Fever+ erythematous pharyngitis, lymphadenopathy
- ▶ Sometimes maculopapular/scarlatiniform rash on extremities then trunk
- ▶ Usually spares the face, sometimes pruritus
- ▶ Negative tests of strep. and mono.



Fever and urticarial rash

- ▶ Serum sickness like illness
- ▶ Enteroviral illness
- ▶ Kawasaki disease

Serum sickness like illness

- ▶ Type Ⅲ or immune-complex mediated hypersensitivity disease
- ▶ 1-3 wks. after start of antibiotics, anticonvulsants, immunosuppressives
- ▶ Urticarial lesions (>24 hr. in each site), then central clearing on abdomen and lower legs
- ▶ Polyarthralgia or polyarthritis, lymphadenopathy, with mild or no fever
- ▶ Sometimes erythema and edema of hands and feet



Serum sickness like illness

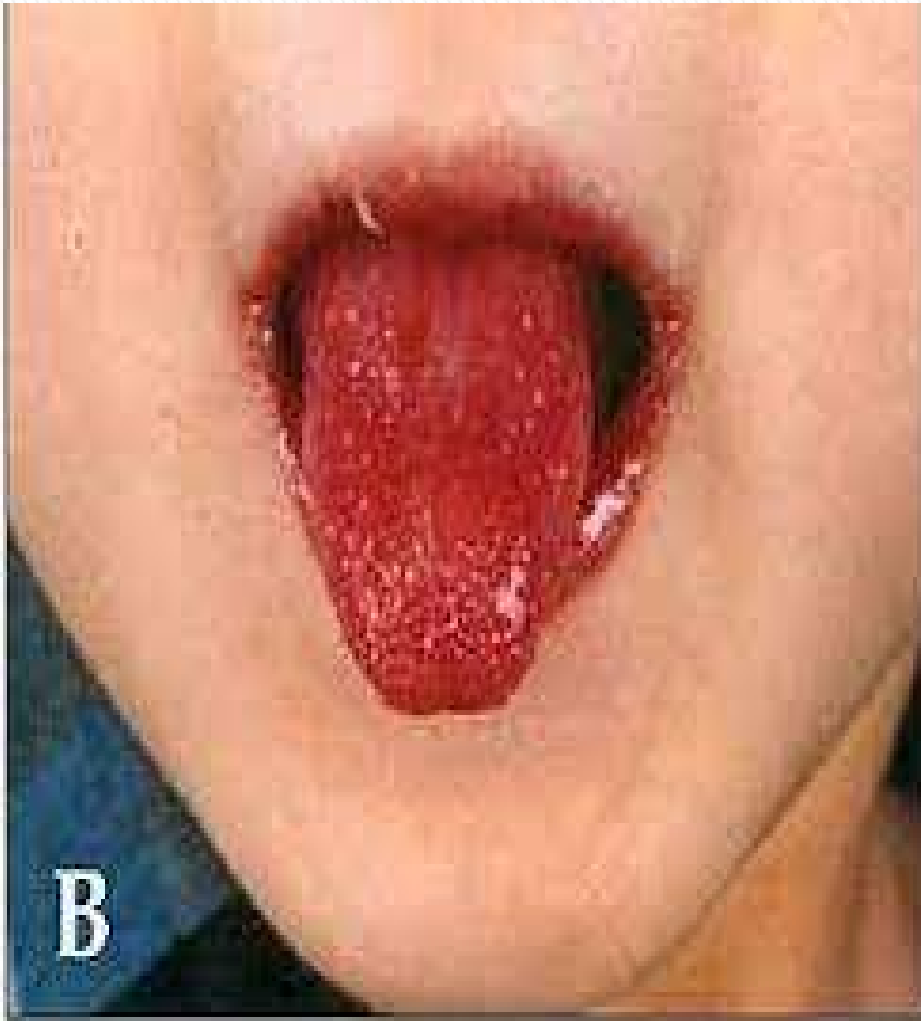


Kawasaki disease

- ▶ Unknown etiology
- ▶ All rash except petechial and vesicular/pustular/bulla rash
- ▶ High fever > 3 - 5 d.
- ▶ Δ Clinical criteria: rash, bilateral bulbar conjunctivitis, oral erythema, extremity edema/ erythema/ desquamation, unilateral cervical lymphadenopathy
- ▶ \hat{r} Laboratory criteria: Elevated WBC, PLT, ALT, urin WBC, decreased Hb, albumin
- ▶ Risk of Cardiac involvement: coronary aneurysm/ dilatation/ loss of tapering, decreased LV function, MR, pericardial effusion
- ▶ Complete form: fever+ \hat{r} of Δ criteria
- ▶ Incomplete form: fever+ \hat{r} or \hat{r} criteria + elevated ESR/CRP + \hat{r} of six laboratory criteria / cardiac involvement



Kawasaki disease



Kawasaki disease



THANK YOU