Infectious Rash Illnesses

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Rash

Definition: Rash: Skin lesions arise
(1) quickly
(2) in more parts of the body

Rash (exanthematic) illnesses
• have rash as a regular and prominent symptom
• that can be suggestive of the diagnosis

Typical rash develops as a hematogenic spread of bacterial toxins, viruses or active substances

Diagnostic Approach (1)

1. Medical history of the present illness
2. Physical examination
3. Laboratory tests and other examinations

Diagnostic Approach (2)

Age
Time of year
Exposure history
• Occupation
• Contact with animals
• Insect or tick bite
• Ingestion of specific foods
• Sexual practices
• Drug use
• Traveling

Diagnostic Approach (3)

Past medical history
• Immune status (malignancy, transplantation, splenectomy, HIV infection, steroids)
• Severe illness (valvular heart disease, haemodialysis, diabetes mellitus, cirrhosis)
• Past childhood illnesses
• Vaccination
• Medication

Diagnostic Approach (4)

Rash:
• Lesion morphology (size, elevation, color, confluence)
• Distribution and development (time of appearance, localization, disappearance, pigmentation, desquamation)
Diagnostic Approach (5)

**Classification** according to the morphology:
- Rash
  - maculopapular
  - urticarial
  - petechial
  - vesiculopustulous
  - other (nodular, specific skin syndromes: erythema multiforme, erythema migrans etc.)
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Vesiculopustulous Rash

Herpes zoster (shingles)

Diagnostic Approach (14)

Other skin signs
- Other skin lesions, face and typical phenomena

Accompanying symptoms:
- Fever
- Adenopathy
- Catarrhal symptoms

Others:
- Arthralgias
- Hepatosplenomegaly
- Meningeal signs

Diagnostic Approach (15)

Laboratory Tests
- BC and differential
- CRP
- Liver tests
- Throat swab (as well prolonged culture)
- Blood culture
- NAAT (PCR)
- Serologic tests

Other examinations
- ECG
- Chest X-ray
- LP
- Biopsy

Serologic Tests

Viral infections:
- Measles
- Rubella
- Paul-Bunnell
- Herpetic viruses
- Enteroviruses
- Adenoviruses
- Parvovirus B19
- HIV
- Dengue

Other infections:
- Syphilis
- Mycoplasma
- Rickettsioses
- Leptospirosis
- Toxoplasmosis
- Tissue helminths
Scarlatiniform Rash or Diffuse Erythema

**Infectious:**
- Scarlet fever
- Toxic shock syndrome (TSS)
- Infection due to Arcanobacterium haemolyticum
- Staphylococcal scalded skin syndrome (SSSSS)
- Dengue fever and other imported febrile rash diseases

**Noninfectious or infection nonproven:**
- Kawasaki syndrome
- Toxic epidermal necrosis (TEN)
- Drug hypersensitivity rashes

Scarlet Fever

**Incidence**
- 100-200 cases/100,000 citizens annually
- Time of year: autumn and winter
- Children aged 3-10 years

**Etiology:**
- Streptococcus pyogenes A (C, G) produces streptococcal pyrogenic toxin A, B and C
- ID: 2-7 days

**Rash**
- maculopapular
- fine (<1 mm)
- elevated (rough)
- light red
- nonconfluent
- inguinal and axillary region, neck

**Other skin signs**
- Circumoral pallor (Filatov’s sign)
Other skin signs
- White dermographism
- Šrámek’s sign

Other skin signs
- Pastia’s sign

Course
- mild or moderate, fever abates within 24 hours after initiation of antibiotic therapy

Complications (rare)
- Peritonsillar abscess
- Other inflammatory diseases of upper respiratory tract, seldom bacteremia with metastatic foci
- Toxic complications: myocarditis, (interstitial) nephritis etc.
- Late ("sterile") sequelae: rheumatic fever, acute poststreptococcal glomerulonephritis

Diagnosis
- Clinical manifestations
- Throat swab: b-haemolytic streptococci
- Other lab tests, including ASLO (ASO) - not important
- Procam-benzylpenicillin (3 days) + benzathinpenicillin
- Macrolids (in case of PNC allergy)
- Alternatives: lincomycine, cefalexin etc.

Complications
- Mild or moderate, fever abates within 24 hours after initiation of antibiotic therapy

Arcanobacterium haemolyticum Infection

Etiology
- Arcanobacterium haemolyticum

Clinical manifestations
- Pharyngitis or tonsillitis
- Fever
- Rash - localized more to extremities

Diagnosis
- Causative agent - prolonged throat swab culture

Therapy
- Macrolids, lincosamids, tetracyclins

Toxic Shock Syndrome

Incidence
- 0.5 case/100,000 citizens annually (in the USA)
- Young adults, menstrual form - young women

Etiology
- Staphylococcus pyogenes produces (thermolabile) TSST-1, rare streptococcus

Incubation period
- 3-7 days (menstrual form: 3 days, non-menstrual form: 7 days)

Diagnosis
- Criteria (CDC):
  - Certain CSS = 6 criteria
  - Probable CSS = 5 criteria
  - Culture: Staphylococcus, detection of the toxin

Clinic manifestations
- Sudden onset, fever arise, vomiting, diarrhea
- Orthostatic collapse in connection with hypotension
- Rash: more frequently scarlatiniform, rarely rubelliform or petechial
- Mucous membranes: hyperemic - catarrhal conjunctivitis, strawberry tongue
- Laboratory evidence of DIC and MODS

Arcanobacterium haemolyticum Infection

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Kawasaki Disease

Incidence
- 9 cases/100,000 children annually (in the USA)
- Children 6 weeks - 12 years

Etiology
- Unknown - probably immunopathologic response of monocyte-macrophage system to superantigens - bacterial (streptococcal) toxins

Pathology
- Angiitis (vasculitis) - affects particularly coronary arteries - lead to appearance of coronary aneurysms

Clinical manifestations
- Sudden onset of (remitting) fever - >5-10 days
- Arthralgias
- Maculopapulous - scarlatiniform to morbilliform rash
- Hyperemic mucous membranes - conjunctivitis, red cracked lips, strawberry tongue
- Cervical lymphadenopathy
- Swelling and then red discoloration of the palms and soles

Diagnosis
- Clinical manifestations: diagnostic criteria - 5 from 6
- Acute inflammatory markers: BC: leucocytosis, CRP high
- Thrombocytosis
- Urine: proteinuria, sterile leucocyturia
- Signs of cardiac complications: myocardial markers, ECG, ECHO

Therapy
- Immunoglobulins 2 g/kg during first 12 hours, in the case of persistent fever dose has been repeated
- Antiagregant drugs: acetylsalicylic acid, dipyridamole

Dengue Fever

Etiology and epidemiology
- Virus is transmitted by mosquitoes Aëdes in tropical and subtropical areas
- Incubation period: 3-5 days

Clinical manifestations
- Prodromes: fever, sometimes chills, headache, arthralgias, myalgias
- Rash: scarlatiniform - day 3-4

Course
- Fever lasts 5-6 days, biphasic course can occur, rash 2 days, convalescence 2-3 weeks

Staphylococcal Scalded Skin Syndrome (SSSS)

Incidence
- Rare disease of children aged by 5 years

Etiology
- Staphylococcus aureus produces (termostabile) toxins - exfoliatin A and B

Clinical manifestations
- Localized skin infection (pyoderma) can precede
- Sudden onset of fever
- Fine maculopapular rash confluent in flexor creases and periorally, followed by development of flaccid bullae with desquamation
Rubeoliform and Morbilliform Rash

Infectious:
- Measles (morbilli)
- German measles (rubella)
- Fifth disease
- Sixth disease
- Enteroviral infections
- Adenoviral infections
- Reaction after measles vaccination
- Infectious mononucleosis
- Primary HIV infection

Non-infectious or multifactorial:
- Secondary syphilis
- Erythema (exsudativum) multiforme
- Pityriasis rosea
- Rare, particularly imported diseases (rickettsiosis, typhoid fever, jodelu etc.)

Measles (morbilli, "rubeola")

Incidence
- Rare
- Middle aged people (children have been vaccinated)

Etiology
- Measles virus

Incubation period
- 8-14 days (particularly 9 days)

Clinical manifestations
- Prodromal stage:
  - 3-4 days high fever, prominent catarrhal symptoms (conjunctivitis, coryza, pharyngitis, cough)
  - Koplik's spots - day before exanthematic stage, first days of exanthematic stage

Rash
- maculopapular
- large (3-5 mm)
- flat
- deep red, haemorrhagic
- confluent
- spreads from face to trunk and extremities
- lasts more than 5 days, leave rusty discoloration of the skin

Rubella, German Measles, rubeola

Incidence
- Rare

Etiology
- Rubella virus (genus Rubivirus)

Incubation period
- 12-23 days, average 18 days
Rubella, German Measles, rubeola

Rash
- maculopapular
- small (1-3 mm)
- flat
- light red, slightly livid
- non-confluent
- spreads from face to trunk and extremities
- lasts 2-3 (5) days, without discoloration, no desquamation

Sixth Disease (exanthema subitum, roseola infantum)

Incidence
- Common disorder of infants
Time of year: springtime
Etiology
- HHV-6
Incubation period
- 5-15 days
Clinical manifestations
- Prodromal stage: 3-4 days of high fever - febris continua - no catarrhal signs, no lymphadenopathy

Rash Accompanying Infections due to Adenoviruses and Enteroviruses

Incidence:
- A: particularly springtime, winter
- E: particularly summer
Clinical manifestations:
- Rash – E: petechial, vesiculous
- A – morbilliform
- Catarrhal signs (A)
- Sometimes: vomiting, diarrhoea, aseptic meningitis, myokarditis, pleurodynia

Infectious Mononucleosis

Etiology
- Epstein-Barr virus + aminopenicillin (especially amoxycillin) administration
Rash
- maculopapular
- usually large - morbilliform (3-5 mm)
- flat
- deep red, sometimes haemorrhagic
- confluent
- non-pruritic
- frequently spreads from extremities to the trunk
- appears 5-10 days after starting therapy

Rickettsioses

- Rickettsia africae
- Rickettsia conorii (Marseille fever, Mediterranean spotted fever)
- Coxiella burnetii (Q fever)
- Orientia tsutsugamushi (scrub typhus)
- Rickettsia typhi (murine typhus)
Primary HIV Infection

Rash
• maculopapular
• usually large, irregular (3-10 mm)
• flat
• deep red
• confluent
• non-pruritic
• begins on the upper part of the trunk, spreads to other parts of the body
• lasts about 7 days
Other signs: adenopathy, oral aphthous lesions

Secondary Syphilis (syphilis maculosa, roseola syphilitica)

Etiology
• Treponema pallidum
Macular rash (syphilis maculosa, roseola syphilitica)
• macular large (5-10 mm), monomorphic
• lightly browny-pink
• oval-shaped maculae
• non-pruritic
• on the trunk, other parts of the body, on the soles and palms as well
• lasts 5-6 weeks (without therapy)

Pityriasis rosea

Megalerythema infectiosum, Fifth Disease

Rash
• maculopapular
• very large (>5 mm), geographical pattern
• slightly elevated
• deep red, slightly livid, annular appearance
• confluent
• spreads from face to trunk and extremities
• lasts more than 5 days, leave rusty discoloration of the skin
Complications of infection due to parvovirus B19:
• Aplastic crisis can precipitate in pts with underlying haemolytic disorders (E.G. hereditary spherocytosis)
• Chronic anaemia in pts with IDS
• Hydrops foetus
• Rheumatoid disorder of young women

Vesiculopustulous Rash
Infectious:
• Chickenpox
• Herpes zoster disseminatus
• Impetigo
• Kaposi dermatitis
• Hand-foot-mouth disease
• Lues pustulosa
• (Smallpox)

Noninfectious or multifactorial:
• Prurigo simplex acuta (strophulus infantium)
• Dermatitis herpetiformis (Duhring)
• Drug eruptions
• Erythema (exsudativum) multiforme (Hebrae)

Chickenpox (varicella)

Incidence
• About 500 cases/100 000 citizens annually
• Time of year: all year, more frequent in autumn and winter
• Predominantly children (preschool-aged and school-aged)

Etiology
• Varicella-zoster virus (VZV)

Incubation period
• 10-23 days (approximately 15 days)

Clinical manifestations
• Prodroms: no present in children, mild in adults (1-3 days) - fever, headache, myalgias, sometimes scarlatiniform (or morbilliform) rash

Rash multiphasic vesiculopustular:
• maculae – papulae – vesicles – pustulae – crusts
Main laesion represents a superficial teardrop-shaped vesicle 1-5 mm in diameter surrounded by reddened area (“glass pox”) • occurring on the upper trunk, less on the face, sparse lesions on the extremities • 3-5 crops, rash spreads to the extremities
Lesions in more stages may be found simultaneously

Other symptoms/ signs
• Fever
• Mucous membranes involvement (aphthous lesions in the oral cavity)

Course
• Usually 3-6 days
• Crusts fall off after 5-20 days
• Severe form: progressive chickenpox in individuals with IDS, severe skin involvement in patients with eczema
Herpes zoster (Shingles)

Kaposi Varicelliform Eruption, eczema herpeticatum

**Etiology:** HSV

**Clinical manifestations:**
- Rash
  - Vesicles often confluent and madescent, haemorrhagic erosive lesions, edematous basis
  - Usually begins on the face
- Systemic signs are often present.

**Therapy**
- Aciclovir
- Antibiotics (against staphylococci)
- Topical therapy

Hand-Foot-and-Mouth Disease

Urticarial eruptions

**Infectious (rare):**
- Viral hepatitis B
- Enteroviral infections
- Covid-19
- Schistosomiasis, strongyloidosis, filariosis, trichinelliosis

**Non-infectious:**
- Hypersensitivity (food or drug allergy)
- Physical or chemical stimuli

Petechial or Haemorrhagic/Purpuric Rash

**Infectious:**
- Meningococcaemia
- Infective endocarditis
- Other bacteraemias
- Enteroviral infections
- Viral haemorrhagic fevers
- Rickettsioses
Petechial or Haemorrhagic/Purpuric Rash

**Infectious:**
- Meningococcaemia
- Infective endocarditis
- Other bacteriæmas
- Enteroviral infections
- Viral haemorrhagic fevers
- Rickettsioses

**Non-infectious:**
- Thrombocytopenic purpura
- Anaphylactoid purpura
- Allergic vasculitis

Other Specific Skin Syndromes

**Infectious and multifactorial:**
- Erythema (exsudativum) multiforme
- Stevens-Johnson’s syndrome
- Erythema (chronicum) migrans

Erythema (exsudativum) multiforme

**Rash**
- Maculopapular lesions several cm in diameter
- Brick red, in centre paling, another time bullæ appear in central area
- Symmetrical distribution, on the trunk and extremities, involves palms and soles
- Mucosal involvement is often present

mucosal involvement is often present
Stevens-Johnson’s Syndrome, ectodermosis pluriorificialis

Etiology
• same as previous
Clinical manifestations
• Rash
• extensive involvement mucous membranes: mouth, eyes, genitals, anus
• Bullae evolve to ulcer and tend to bleed
• High fever is present
Course
• 2-4 weeks

Erythema nodosum

Etiology
• Infections: streptococcal infections, intestinal infections (salmonellosis, shigellosis, yersiniosis), viral infections (EBV), urogenital chlamydiosis, tuberculosis, systemic mycoses, lepra
• Sarcoidosis
• Noninfectious bowel inflammatory diseases: colitis ulcerosa
• Drugs: sulfonamids, antibiotics
Patogenesis
• Sensibilisation against microbial and other antigens

Scabies

Etiology: mite Sarcoptes scabiei
Rash:
• point crusts, vesicles, pustulae
• fine burrows (a few millimeters long)
• intense itching (especially when the patient falls to bed)
• inguinal creases, on the finger webs, on the genitals, and about the areolae of the breasts in females; that can be found on the lower buttocks (the face, palms and soles usually remain uninvolved)

https://infekce.lf1.cuni.cz