Evaluating the Febrile Patient with a Rash

TABLE 2
Diseases Presenting with Fever and Rash

DISEASE	*ETIOLOGY*	*DESCRIPTION OF RASH*	*EPIDEMIOLOGY*	*DIAGNOSTIC CLUES*	*BASIS FOR DIAGNOSIS*
Rubeola	Measles virus	Macular-papular rash that may become confluent; begins on face, neck and shoulders and spreads centrifugally and inferiorly; fades in 4 to 6 days	Most common in children 5 to 9 years of age, nonimmune persons	Prodrome consisting of symptoms of upper respiratory tract infection, coryza, bark-like cough, malaise, photophobia and fever; Koplik's spots (prodromal stage); development of exanthem on fourth febrile day; late winter through early spring	Serology
Rubella	Rubella virus	Pink macules and papules that develop on forehead and spread inferiorly and to extremities within one day; fading of macules and papules in reverse order by third day	Young adults, nonimmune persons	Prodrome uncommon, especially in children; petechiae on soft palate (Forschheimer's spots); in adults: anorexia, malaise, conjunctivitis, headache and symptoms of mild upper respiratory infection	Serology
Erythema infectiosum (fifth disease)	Human parvovirus B19	Begins as classic bright-red facial rash (“slapped cheek“) and progresses to lacy reticular rash; may wax and wane for 6 to 8 weeks	Children 3 to 12 years of age	Can present as rheumatic syndrome in adults; prodrome of fever, anorexia, rash typically beginning after resolution of fever [corrected]	Serology

DISEASE	*ETIOLOGY*	*DESCRIPTION OF RASH*	*EPIDEMIOLOGY*	*DIAGNOSTIC CLUES*	*BASIS FOR DIAGNOSIS*
Roseola	Human herpes-virus 6	Diffuse maculopapular eruption, usually sparing face	Children 6 months to 3 years of age	Fever lasting 3 to 4 days, followed within 2 to 3 days by the rash, which resolves spontaneously in several days; almost always a self-limited benign disease; temporal relationship of fever followed by rash is helpful in making the diagnosis	Clinical findings, serology
Lyme disease	*Borrelia burgdorferi*	Macule or papule at site of tick bite, progressing to pathognomonic erythema migrans	All ages at risk for tick exposure in endemic areas	History of tick exposure; secondary erythematous, macular lesions; Borrelia lymphocytoma; highest incidence: May through September	Clinical findings, serology, polymerase chain reaction test
Erythema multiforme	Idiopathic in 50 percent of cases (see Table 3)	Dull-red macules developing into papules with central vesicles or bullae; common on dorsa of hands, palms, soles, arms, knees, penis and vulva; often bilateral and symmetric	Adults 20 to 30 years of age; men affected more often than women	Major and minor forms; major form always with mucous membrane involvement and usually the result of drug reaction; minor form often associated with herpes simplex outbreak; rarely life-threatening	Clinical findings

DISEASE	*ETIOLOGY*	*DESCRIPTION OF RASH*	*EPIDEMIOLOGY*	*DIAGNOSTIC CLUES*	*BASIS FOR DIAGNOSIS*
Secondary syphilis	*Treponema pallidum*	Various presentations; brownish-red or pink macules and papules; generalized eruption or localized eruption on head, neck, palms or soles; condyloma lata common	Adolescents and adults 15 to 49 years of age; females affected more often than males	Develops 2 to 10 weeks after primary chancre; presents with or without fever; may have generalized lymphadenopathy and splenomegaly; may have recurrent eruptions with symptom-free periods	Dark-field examination, serology
Meningococcemia (acute)	*Neisseria meningitidis*	Variety of lesions but, characteristically, petechial lesions distributed on the trunk and extremities (although the lesions can be located anywhere); petechiae on mucous membranes	Highest incidence in children 6 months to 1 year of age	Acutely ill patient; high fever, tachypnea, tachycardia, mild hypotension; leukocytosis; meningitis develops in more than 50 percent of patients	Often, clinical findings; blood cultures
Meningococcemia (chronic)	*N. meningitidis*	Intermittent maculopapular lesions, often on a painful joint or pressure point; may have nodules on calves	Same as for acute form	Fever, myalgias, arthralgias, headache, anorexia; may recur for weeks or months, with average duration of 8 weeks; may progress to acute meningococcemia, meningitis or endocarditis	Blood cultures

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Rocky Mountain spotted fever	*Rickettsia rickettsii*	Rash evolving from pink macules to red papules and finally to petechiae; rash beginning on wrists and ankles and spreading centripetally; involvement of palms and soles late in disease	Young adults with tick exposure; men affected more often than women	Onset typically abrupt; fever, severe headache and myalgias are prominent; rash appearing around fourth day of illness; may have relative bradycardia and leukopenia	Clinical findings, serology
Scarlet fever	Beta-hemolytic *Streptococcus pyogenes*	Punctate erythema beginning on trunk and spreading to extremities, becoming confluent; flushed face with perioral pallor; rash fading in 4 to 5 days and followed by desquamation	Children	Acute infection of tonsils or skin; linear petechiae in antecubital and axillary folds (Pastia's sign); rash appearing 2 to 3 days after infection; initially, “white strawberry tongue” but by fourth or fifth day, “red strawberry tongue”	Rapid strep test, wound or throat culture, antistreptolysin O titers
Toxic shock syndrome	*Staphylococcus aureus*	Diffuse “sunburn“ rash that desquamates over 1 to 2 weeks	All ages, but most common in menstruating females	High fever, hypotension and involvement of three or more organ systems; about 50 percent of cases occurring in menstruating women around onset of menses; postoperative patients at increased risk; condition out of proportion to wound appearance	Clinical criteria, vaginal and wound cultures

DISEASE	*ETIOLOGY*	*DESCRIPTION OF RASH*	*EPIDEMIOLOGY*	*DIAGNOSTIC CLUES*	*BASIS FOR DIAGNOSIS*
Kawasaki's disease	Idiopathic	Erythematous rash on hands and feet; morbilliform, scarlatiniform rash on trunk and perineum; hyperemic lips	Children less than 8 years of age, with peak incidence at 1 year; boys affected more often than girls	Winter and spring; high fevers, cervical lymphadenopathy, arthritis, arthralgias, cardiac involvement, mucous membrane involvement; can be complicated by coronary artery abnormalities in 20 to 25 percent of cases	Specific clinical criteria
Chickenpox	Varicella-zoster virus	Initially, papules, which evolve into vesicles (“dewdrops on a rose petal”) and eventually into pustules and crusts; rash beginning on face and spreading inferiorly to trunk and extremities	90 percent of cases in children less than 10 years of age; 5 percent of cases in persons older than 15 years	Prodrome consisting of headache, general aches, backache and malaise is typically absent in children; exposure history; may have all forms of lesions at the same time; vesicles evolving to shallow erosions common on mucous membranes of palate; may also have vesicles on nasal, conjunctival, gastrointestinal tract and genital mucosa	Clinical findings, confirmed by Tzanck test
Herpes zoster (shingles)	Varicella-zoster virus	Begins as erythematous maculopapular eruption, rapidly evolves to vesicles	All ages, but incidence increases with age and immunosuppression	Prodrome of unusual skin sensations; dermatomal pattern, with lesions rarely crossing midline; pain often severe; more common in thoracic and facial dermatomes	Clinical findings, confirmed by Tzanck test

DISEASE	ETIOLOGY	DESCRIPTION OF RASH	EPIDEMIOLOGY	DIAGNOSTIC CLUES	BASIS FOR DIAGNOSIS
Rickettsialpox	*Rickettsia akari*	Generalized maculopapular-vesicular exanthem; possible involvement of mucous membranes; no involvement of palms or soles	All ages; urban settings	Transmitted from mice to humans via mites; formation of papules 7 to 10 days after initial bite; typically, formation of a black eschar over healing lesion; febrile phase occurring 3 to 7 days after initial lesion and lasting up to a week; self-limited, usually mild course	Serology
Erythema nodosum	Various causes (see Table 4)	Bright-red nodules (3 to 20 cm in diameter) scattered bilaterally but not symmetric; most frequently on lower legs but also found on knees and arms; rarely found on face and neck; lesions often tender and indurated	Adolescents and young adults 15 to 30 years of age; females affected more often than males	Thorough history and physical examination to identify known causes; throat culture for group A beta-hemolytic streptococci; chest radiograph to rule out sarcoidosis; arthralgias present in 50 percent of cases; fever and malaise common	Clinical findings

Adapted with permission from Kaye ET, Kaye KM. Fever and rash. In: Fauci AS, et al., eds. Harrison's Principles of internal medicine. 14th ed. New York: McGraw-Hill, Health Professions Division, 1998:90–7, with additional information from Fitzpatrick TB, et al. Color atlas and synopsis of clinical dermatology: common and serious diseases. 3d ed. New York: McGraw-Hill, Health Professions Division, 1997.