Varicella

manifestations and complications

Introduction

- Varicella is a highly contagious, systemic infection characterized by fever and a generalized pruritic rash lasting approximately 5-7 days.
- It has variable severity but is usually self-limited.

Increased rate of skin and soft-tissue infections after chickenpox: Is it related to the COVID-19 pandemic?

Several European countries have also reported the experience of an increased number of GAS infections during 2022.[3,4]

A literature review revealed a similar report of the increased rate of SSTIs after chickenpox in 2003 in Canada and a relationship between the increased rate of GABHS infections and postchicken pox SSTIs.[1]

Young children have experienced less exposure to GAS and are unlikely to possess antibodies against

and during the outbreak of postchickenpox SSTIs in Iran. This increase occurred following a period of reduced incidence of Group A Streptococcus (GAS) infections during the COVID-19 pandemic.

Totally, 75% of our cases led to abscess formation. However, we could not isolate the causative organism of SSTIs despite drainage of the abscess, probably

Table 1: The characteristics of the patients

Case	Sex	Age (years)	Time interval between chickenpox and SSTI (days)	Site of infection	Blood and discharge culture	Complication
1	Male	8	8	Submandibular area	Negative	Abscess formation
2	Male	10	5	Inguinal and scrotum	Negative	Cellulitis
3	Female	1	8	Knee and proximal site of leg	Negative	Abscess formation
4	Female	8	12	Axilla and upper chest	Negative	Abscess formation

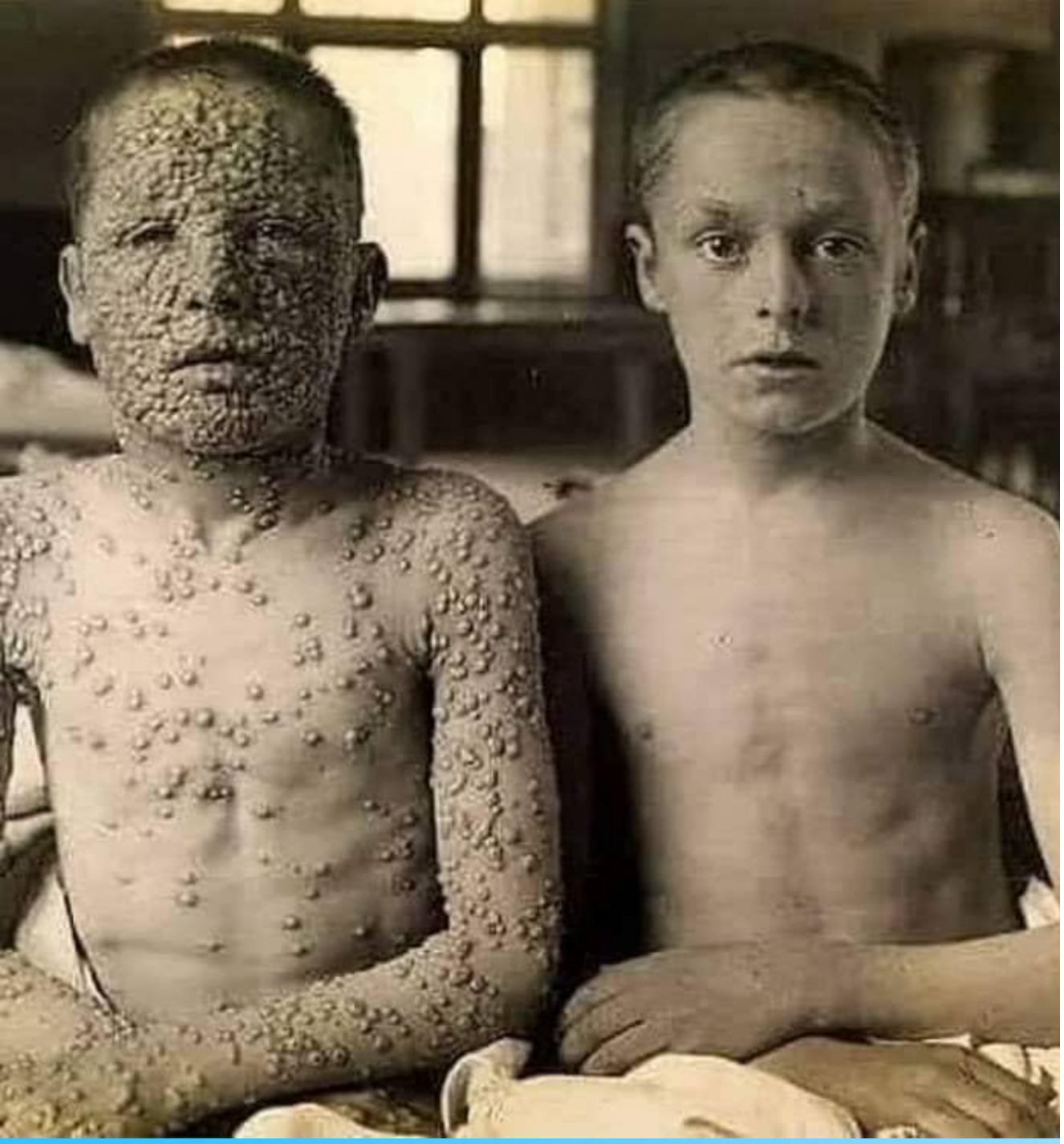
SSTI=Skin and soft-tissue infection

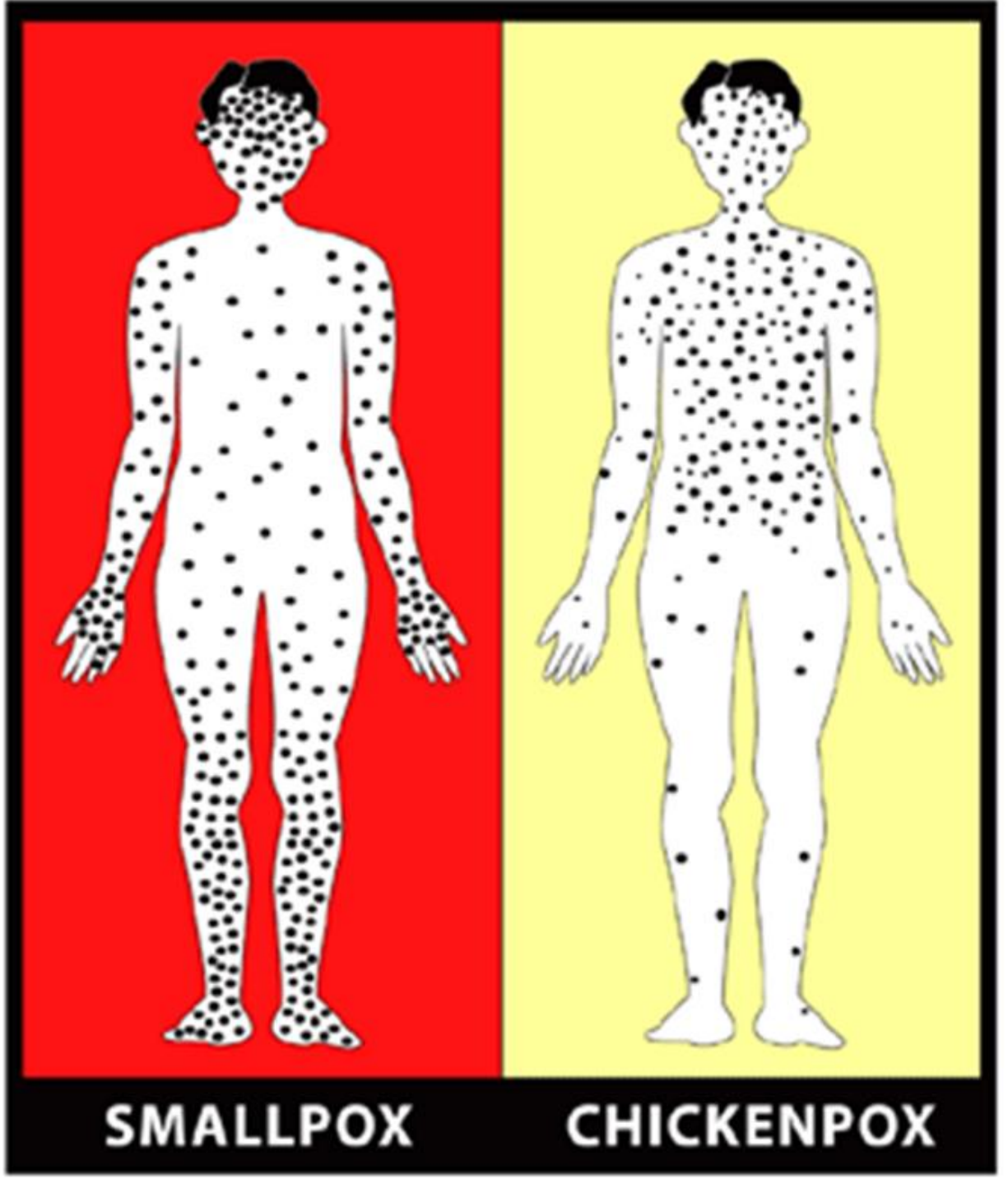
Introduction

- The rash occurs 10 to 21 days after the exposure, with an average of 14-16 days.
- A prodromal phase in children is unusual, more in older children and adults
- malaise and fever, anorexia, headache, and occasionally mild abdominal pain for 1 to 2 days before the onset of rash .
- fever and other systemic symptoms usually resolve within 2-4 days after the onset of the rash.

Rash

- Subclinical varicella is rare.
- Almost all exposed, susceptible persons experience a rash, albeit so mild in some cases that it may go unnoticed.
- Varicella lesions often appear first on the scalp, face, or trunk
- The rash is more intense on the trunk and head than on the extremities,
- The average number of varicella lesions is about 300, but healthy children may have fewer than 10 to more than 1,500 lesions.




SMALLPOX
CHICKENPOX

Rash

- The characteristic lesions are clear vesicles on an erythematous base, small pustules, and small crusted ulcers
- Clouding and umbilication of the lesions begin in 24-48 hours.
- if several stages of the lesion are present at the same time the diagnosis is assured.
- Itching is prominent.

varicella lesions in various stages

An adolescent girl with varicella lesions in various stages.

School-aged girl with varicella who acquired it from a younger sibling, who had a milder clinical course with fewer lesions.

School-aged child with varicella who acquired it from a younger sibling.

An adolescent girl with varicella lesions in various stages

Lymphadenopathy

- Lymphadenopathy may be present, particularly in the nodes draining the scalp or areas of scratched lesions.

Mucosal lesions

- **Mucosal lesions can occur.**
- **Not uncommonly, a few lesions may develop in the:**

✓**oropharynx**

✓**conjunctiva**

✓**vagina**

Varicella lesions are apparent on the palate.

Rash

- Occasionally, the lesions are larger than the usual 1 or 2 mm in diameter.
- Large bullae may occur, which may resemble—or be due to—staphylococcal scalded skin syndrome.
- Secondary infection of the pustules with S. aureus or group A streptococci occasionally occurs, which can be relatively benign or herald severe, necrotizing infection.

Bullous varicella uncomplicated in a 1-year-old.

Bullous varicella. Staphylococcus aureus organisms may be present in these large bullae.

Varicella with bullous lesions. Culture results of vesicle fluid were negative for bacteria.

Varicella with bullous lesions. Blood culture results were negative for bacteria. Cellulitis at sites of bullous lesions resolved while receiving oral dicloxacillin sodium.

Varicella with erythema multiforme.

Rash

- **Residual scarring is exceptional but can occur, and depigmented areas of skin may develop in dark-skinned patients.**

Severe varicella

- Severe infections are more likely to develop in adults than in children, presumably because of less robust cell-mediated immune responses to VZV in adults than in children
- Neonates who acquire varicella from their mothers in the few days before delivery also are at risk for acquisition of severe varicella because of immaturity of the cell-mediated immune response.

A neonate with hemorrhagic varicella with cellulitis. This newborn contracted varicella at birth from his mother, who was infected

Diffuse hemorrhagic, vesicular skin rashes on his body.

A male toddler with hemorrhagic varicella complicating acute lymphocytic leukemia

Complications of Varicella

- The most frequent complications of varicella in normal hosts are bacterial superinfections and CNS complications.

Secondary Bacterial Infections

- Bacterial superinfection usually involves the skin and soft tissue , lungs, or bones and joints
- Secondary bacterial infection of lesions is the most common complication of chickenpox.

Secondary bacterial infections of the skin and soft tissue infection

- Impetigo
- cellulitis
- subcutaneous abscesses
- Necrotizing fasciitis

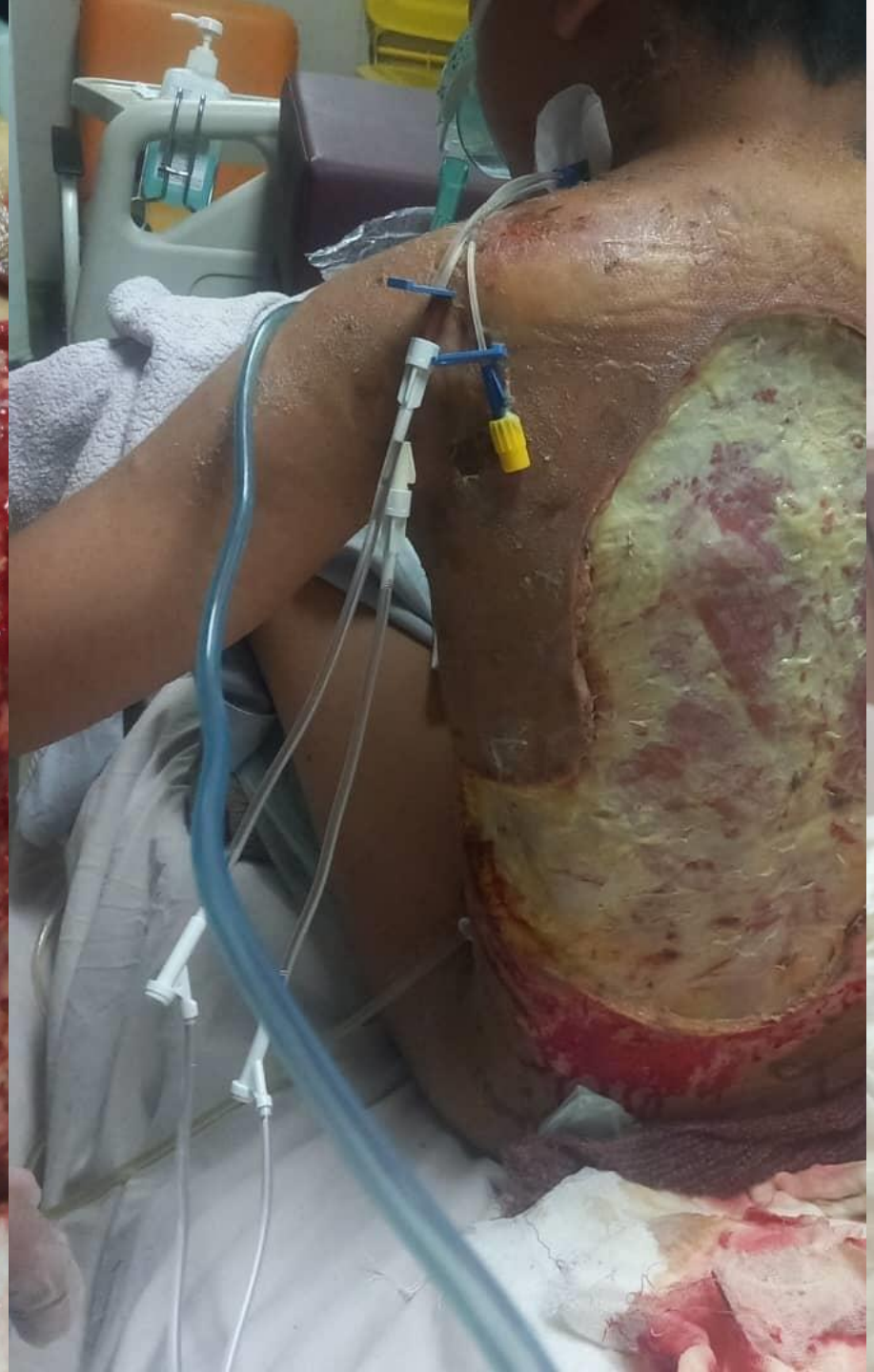


suspected secondary bacterial infections of chickenpox, particularly when there is

- new onset of fever after an initial defervescence.
- erythema of the base of a new vesicle.
- unusually persistant high fever
- an unusual amount of erythema, tenderness, or purulent discharge
- Pain out of proportion to the clinical findings

Features That Suggest a Necrotizing Infection

- ✓1.Severe, constant pain
- ✓2. Bullae related to occlusion of deep blood vessels
- ✓3. Skin necrosis or ecchymosis that precedes skin necrosis
- ✓4. Gas in the soft tissues, detected by palpation or imaging
- ✓5. Edema that extends beyond the margin of erythema
- ✓6. Hard, wooden feel of the subcutaneous tissue, extending beyond the area of apparent skin involvement
- ✓7. Rapid spread, especially during antibiotic therapy
- ✓8. Systemic toxicity—fever, leukocytosis, delirium, renal failure


Nervous system Complications

- Nervous system manifestations are the second most commonly encountered complication of varicella infection.

CNS complications

- ✓transient cerebellar ataxia
- ✓cerebral encephalitis
- ✓aseptic meningitis
- ✓transverse myelitis

cerebellar ataxia

- cerebellar ataxia is by far the most frequent, occurring in approximately 1 in 4000 cases of chickenpox.
- The onset is acute and usually follows resolution of the skin disease.
- The prognosis is excellent.

Encephalitis

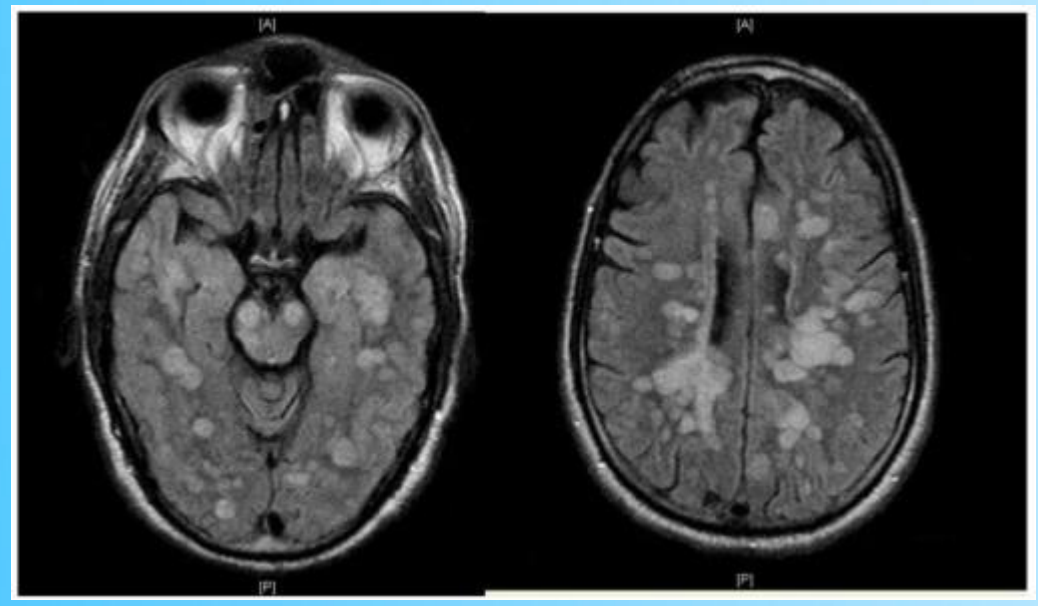
- Encephalitis is thought to be secondary to direct viral invasion of the CNS, or the far more common postinfectious encephalitis is thought to be strictly immune mediated.

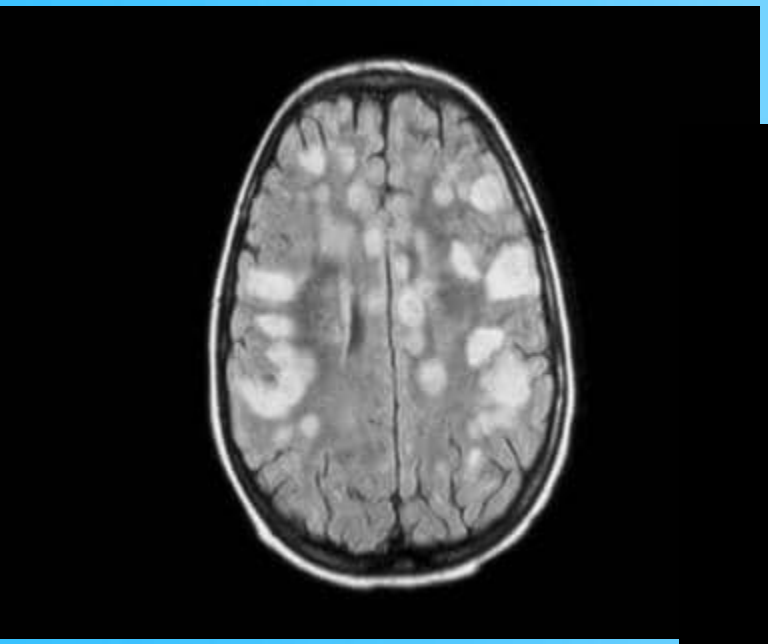
acute disseminated encephalomyelitis

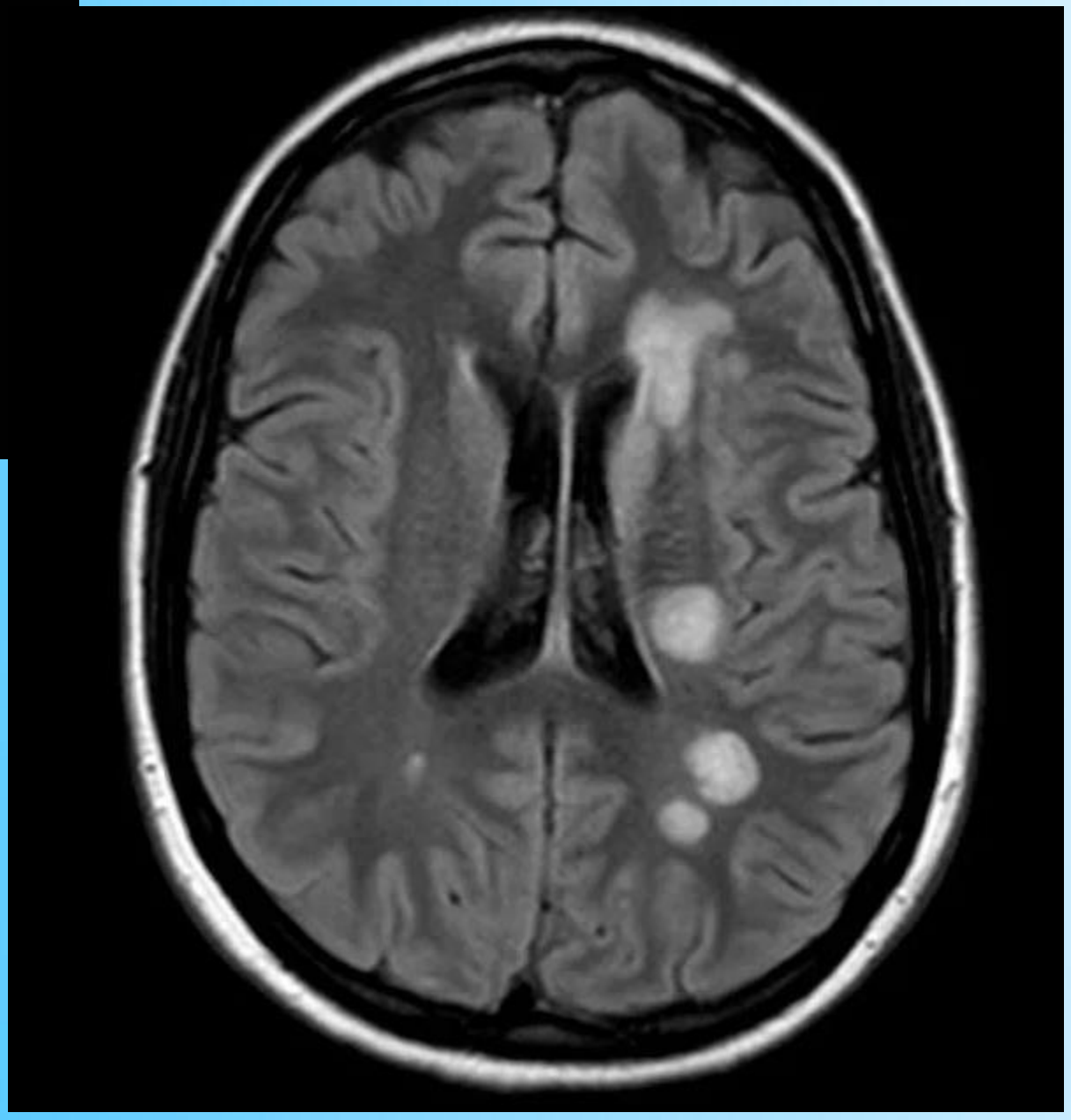
- acute disseminated encephalomyelitis (ADEM), postinfectious encephalitis is estimated to account for 10% to 15% of cases of acute encephalitis
- The presentation is similar to infectious encephalitis, but the onset is typically 1 to 3 weeks after recovery from the illness.
- Examination of CSF usually demonstrates a mild mononuclear cell pleocytosis and slightly elevated protein, but CSF is completely normal in one-third of patients.

Postinfectious Encephalitis

- most useful test is T2-weighted MRI, which usually shows bilateral, asymmetrical, patchy areas of demyelination in the white matter, basal ganglia, or spinal cord.







Reye syndrome

- Reye's syndrome is a rare but serious complication of chickenpox.
- Encephalopathy as a sequela of Reye syndrome has become a rare complication because aspirin no longer is recommended for children with varicella.

stroke & varicella

- Recently it was found that the incidence of stroke in children is increased in the months following varicella.
- An exhaustive study did not find an association of increased stroke incidence in children who were vaccinated against varicella.

peripheral facial nerve palsy

- Varicella-zoster virus, been observed concurrently with peripheral facial nerve palsy.

acute hemiparesis

- Although multiple sclerosis is rare in childhood, acute hemiparesis is a possible presentation. chickenpox has rarely been reported to present with acute hemiplegia.

Guillain- Barré syndrome

- Guillain-Barré syndrome (GBS) is a rare, immune-mediated complication that can sometimes follow chickenpox, although it is more commonly associated with shingles.

Bacteremia

- Bacteremia due to group A streptococcus typically occurs as a complication of chickenpox,

Keratitis

- Keratitis from VZV occurs during primary infection on rare occasions.
- VZV more commonly causes keratitis upon endogenous reactivation (zoster); the disease is known as herpes zoster ophthalmicus.
- As in most cases of zoster (shingles), waning cellular immunity is the harbinger of this condition; therefore, it is seen in childhood mostly in the setting of immune deficiency syndromes.
- Dendritic lesions of the cornea may be seen, but they are usually slightly different from those of HSV and less destructive.

Varicella with scleral lesions and bulbar conjunctivitis

A school-aged girl with bilateral periorbital cellulitis and necrotizing fasciitis caused by a group A β-hemolytic streptococcal infection complicating varicella.

anterior uveitis

- VZV rarely produces an anterior uveitis during primary chickenpox and can also produce the disease on reactivation, sometimes in the absence of typical zosteriform skin lesions.

Other rare ophthalmic comlications

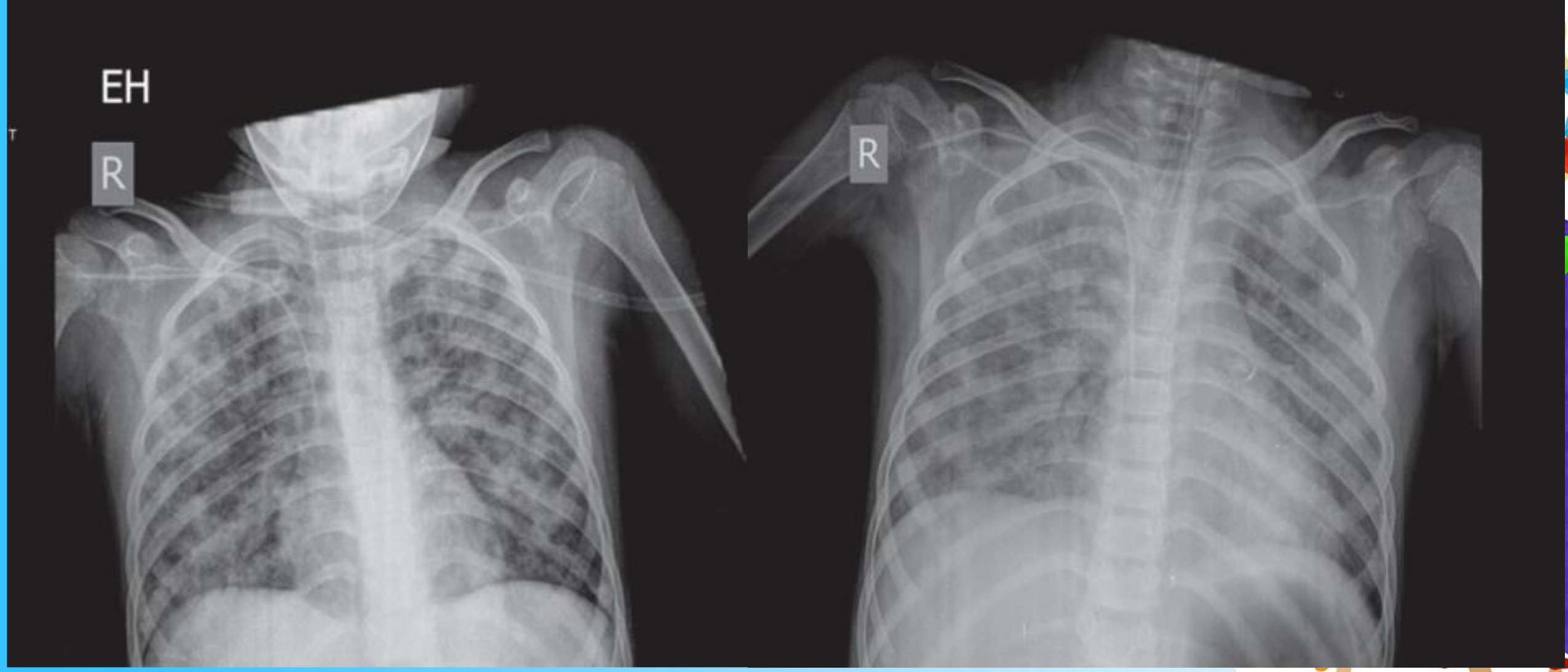
- acute retinal necrosis
- neuromyelitis optica

Pneumonia

- Varicella-zoster virus can produce atypical pneumonia, especially in adults.
- Patients with compromised immunity are most likely to suffer from pneumonia .
- The pneumonia usually has an interstitial pattern and can be severe, sometimes necessitating mechanical ventilation and even (ECMO).

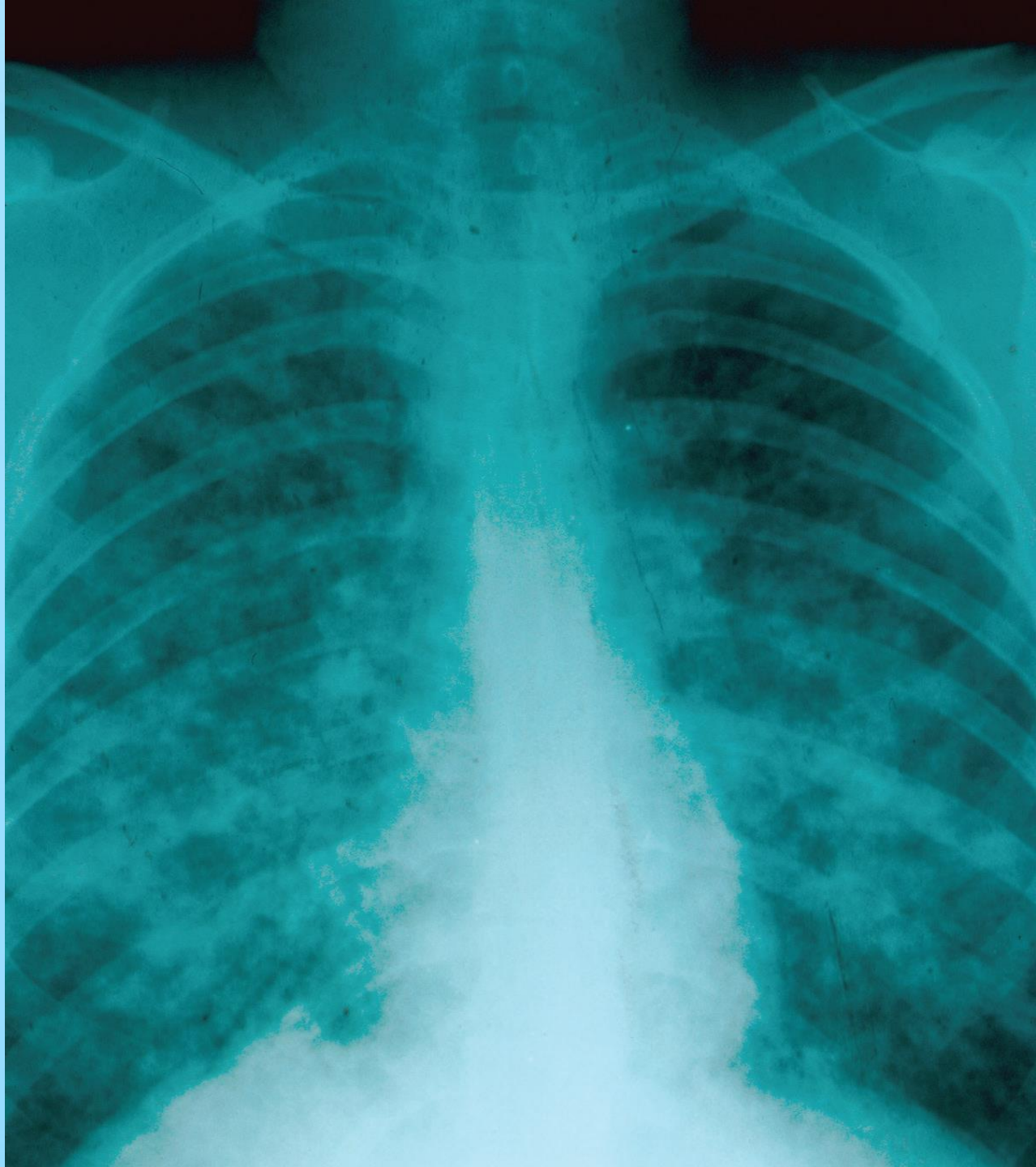
pneumonia

- Primary varicella pneumonia accounts for many of the fatalities ascribed to varicella, particularly in immunocompromised patients and adults.
- Symptoms include fever, cough, and dyspnea. Other common symptoms and signs are cyanosis, rales, hemoptysis, and chest pain.
- The chest radiograph typically reveals a diffuse nodular or miliary pattern that is most pronounced in the perihilar region.



chest radiograph showing diffuse pulmonary infiltrates

Diffuse varicella pneumonia bilaterally shown in the chest radiograph of the patient with Hodgkin disease.



Hepatitis

- In the otherwise healthy child, asymptomatic transient varicella hepatitis is relatively common
- Hepatitis is less common than pneumonia and is usually not life threatening, although severe cases with associated DIC have been reported.

arthritis

- Mono- or polyarticular arthritis occasionally occurs with VZV infection.
- It is often due to secondary bacterial infections, but sometimes the virus is either recovered from joint fluid by culture or proven to be present by the use of PCR.

Cardiac complications

- **Myocarditis with VZV infection has been reported, as has intractable ventricular tachycardia.**

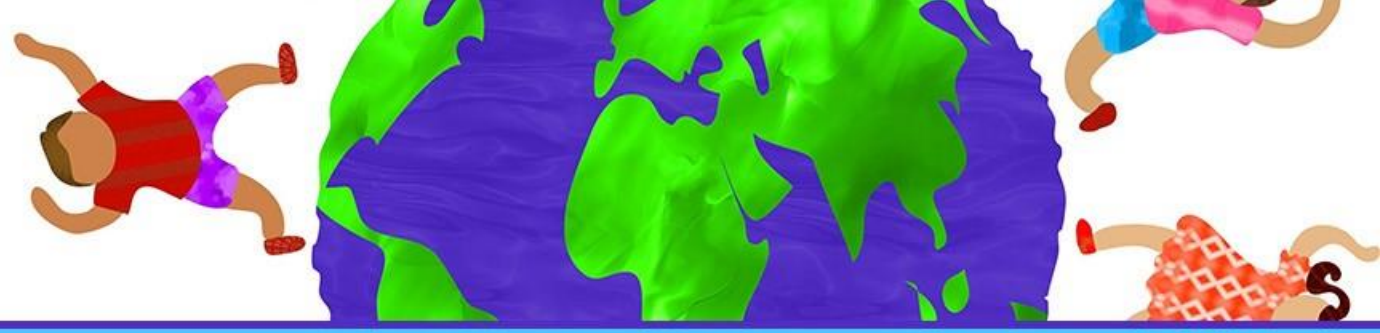
Bleeding disorders

- Thrombocytopenia
- hemolysis in patients with congenital hemoglobinopathy
- paroxysmal cold hemoglobinuria
- DIC

Kawasaki disease during the course of varicella.

- There are a handful of reports of children developing Kawasaki disease during the course of varicella.
- It is likely that these cases represent temporal coincidence of two relatively common diseases in childhood.

Complications



- Secondary bacterial infection, especially with staphylococci and streptococci
- Interstitial pneumonia
- Encephalitis (CSF pleocytosis)
- Reye syndrome (no CSF pleocytosis)
- Cerebellar ataxia or transverse myelitis
- Labyrinthitis or vertigo
- Septic arthritis or varicella arthritis
- Glomerulonephritis
- Purpura fulminans
- Progressive disseminated chickenpox
- Myocarditis with dysrhythmias
- Acute retinal necrosis
- Acute hemolysis in a patient with hereditary spherocytosis
- Facial palsy
- Guillain-Barré syndrome
- Group A streptococcal epiglottitis
- Paroxysmal cold hemoglobinuria

THANK YOU