CHICKENPOX
(VERICELLA)
Chickenpox is the primary infection caused by varicella zoster virus.
Etiology

- **VZV**: A neurotropic human herpes virus
- It causes three types of infection:
  - **Primary**: Chickenpox
  - **Latent**: Chickenpox results in lifelong infection of sensory ganglion neurons.
  - **Reactivation of latent infection**: causing herpes zoster (shingles).
Pathogenesis

- **Transmission**: Through respiratory secretions and fluid of skin lesions.

- Air borne or direct contact.

- Primary infection results from inoculation of virus on to mucosa of the upper respiratory tract and tonsillar lymphoid tissue.
- **Early Incubation period:** Viral replication in local lymphoid tissue: Subclinical viremia.

- **Clinical viremia:** cutaneous lesions, lasting three to seven days.

- Host immune responses limit viral replication.
- Virus $\rightarrow$ Sensory axons (retrograde transmission) $\rightarrow$ Dorsal root ganglia $\rightarrow$ Latent infection of neurons.

- Reactivation $\rightarrow$ Herpes zoster (dermatomal distribution).
Exposure
Spread by respiratory droplets
Highly infectious during viral shedding

Illness

Viral shedding

Days: incubation
10-23 (median 14)
Clinical Features

- **Incubation period:** 10 – 21 days.
- **Prodromal symptoms:** Fever, malaise, anorexia, headache, abd pain.
- Lesions first appear on scalp, face or trunk.
- Pruritic erythematous macules → Papules → vesicles → Pustules → Crusting.
- **Hallmark of varicella:** Simultaneous presence of lesions in various stages of evolution.
- Distribution of rash: Centripetal.
- Average number of lesions 300 (range 10-1500)
- Hypo/hyper pigmentation lasts days to weeks.
- Scarring unusual except in secondary infected lesions.
Rash comes in crops for 3–5 days

- Papules
- Vesicles
- Pustules
- Crusts
Typical vesicular rash

200–500 lesions starting on head and trunk progressing to peripheries

Vesicular rash of chickenpox calamine lotion has been applied (Courtesy of Dr Robert Primhak)
Neonatal Chickenpox

- High risk: if mother develops varicella 5 days prior to or 2 days after the delivery.

- Infant's rash may occur towards end of 1st week to early part of 2nd week of life.

- Low risk: if varicella in mother develops > 5 days prior to delivery (role of maternal antibodies).
Differential Diagnosis

- Other infections with vesicular rash:
  - herpes simplex
  - Entero virus
  - Small pox
  - S.aureus
  - Drug reactions
  - Contact dermatitis
  - Insect bites
Diagnosis

Lab investigation not necessary for diagnosis and management.

Blood CP:
- Leukopenia during first 72 hours
- Followed by absolute lymphocytosis
LFTs mildly deranged.

CSF R/E (pts with neurological complications)

- Mild lymphocytic pleocytosis.
- Mild to moderate increase in proteins.
- Glucose conc. normal.
Confirmatory Tests

- PCR
- Direct fluorescence assay of cells from cutaneous lesions.
- Tissue culture methods.
- VZV IgG: 4folds rise is confirmatory.
Treatment

Acyclovir

* only antiviral recommended for Pediatric use

* Not recommended for routine use in uncomplicated case

* Oral 20mg /kg/dose QID for 5 days ( > 12 months old)
- **Indications**
  - Chronic cutaneous or pulmonary complications
  - Patients receiving short term corticosteroids
  - Patient receiving long term salicylate therapy
I/V Therapy:
- 500 mg/m² 8 hourly (within 72 hrs)
- Continue treatment for 7 days.

Indications:
- Immunocompromised pts
- Disseminated VZV (pneumonia, severe hepatitis, thrombocytopenia, encephalitis)
Complications

Patients at risk:

- Immunocompromised
- Malignancy
- Pregnant
- Newborns
- HIV

Mortality rate: 7%
Progressive varicella:
- a dreaded complication
- Visceral organ involvement
- Coagulopathy
- Severe hemorrhage
- Continued vesicular lesions
Haemorrhagic chickenpox seen in malnourished or immunodeficient children (Courtesy of Dr Sam Walters)
BACTERIAL SUPERINFECTIONS

- Staphylococcal
- Streptococcal
- Necrotising fasciitis
- Toxic shock syndrome

CENTRAL NERVOUS SYSTEM

- Cerebellitis
- Encephalitis
- Aseptic meningitis
IMMUNOCOMPROMISED

- Haemorrhagic lesions
- Pneumonitis
- Progressive and disseminated infection
- DIC
Congenital Varicella Syndrome

- Mothers with chickenpox early in pregnancy
- 25% fetuses become infected

- **Stigmata of VZV fetopathy**
  - Damage to sensory nerves
    - Cicatricial skin lesions
    - Hypopigmentation
- Damage to optic stalk and lens vesicle
  - Microphthalmia
  - Cataracts
  - Chorioretinitis
  - Optic atrophy

- Damage to brain/encephalitis
  - Microcephaly
  - Hydrocephaly
  - Calcifications
  - Aplasia of brain
- Damage to cervical or lumbosacral cord
  
  Hypoplasia of an extremity
  Motor and sensory deficits
  Absent reflexes
  Horner syndrome
  Anal/urinary sphincter dysfunction
Diagnosis of VZV fetopathy:

- History of gestational varicella
- Stigmata in fetus
- VZV IgG titer in infants
- CVS for viral DNA, virus or antibodies

Treatment of Congenital varicella syndrome:

- Mother: Varicella Igs, Acyclovir
- Baby: Since damage caused by fetal VZV doesn’t progress in postpartal period, antiviral treatment not indicated.
PREVENTION

- Infection control practices
- **VACCINE:** Live virus vaccine
  Monovalent
  Combine with MMR

**Indications:**
- Routine administration at 12-18 mo of age (single dose)
- Adolescents and adults without history of varicella infection (2 doses, 4 weeks apart)
Contraindication to VACCINE:

- Cell mediated immune deficiency (except pts with ALL in remission)
- HIV infected (except CD 4 count > 15%)
Breakthrough Varicella (Varicella in vaccinated individuals)

- Occurs > 42 days after vaccination.
- Caused by wild type VZV.
- Atypical rash with less frequent vesicles.
- < 50 lesions.
- No fever.
- 1/3 times as contagious as unvaccinated cases.
Post Exposure Prophylaxis

1. Vaccine:
   Given 3-5 days post exposure
   Recommended for outbreak control
2. High titer anti VZV lgs:

Recommended in:

- Immunocompromised
- B.M transplant recipients
- Congenital VZV fetopathy
  - 400 mg/kg once within 96 hours of exposure
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