

MANAGEMENT OF THE NEWBORN AT RISK OF NEONATAL VARICELLA (VZV) INFECTION

Background

- Neonatal varicella is serious illness associated with a mortality rate up to 30%.
- Incubation period of varicella 14-16 days, may be 10-21 days (28 days in preterm newborns)
- Risk factors for acquiring the infection are a seronegative mother with chickenpox <21 days prior to delivery and nosocomial transmission in preterm babies

Congenital Varicella Syndrome

- Incidence 2% and mortality 30%, if maternal VZV infection in the 20 first weeks of gestation, rare thereafter
- Characteristic findings of affected infants:
 - IUGR
 - Skin lesions, cicatricial, which may be depressed and pigmented in a dermatomal distribution.
 - Ocular defects, e.g., chorioretinitis, Horner syndrome, microphthalmus, and nystagmus
 - Limb abnormalities, such as hypoplasia of bone and muscle
 - Central nervous system abnormalities, such as cortical atrophy, seizures, and intellectual disability (mental retardation).

Perinatal Varicella Infection (Maternal Infection during the last 3 Weeks of Pregnancy)

- Incidence 20 – 50%
- Mortality 0%, if maternal VZV infection $\geq 5 - 6$ days before delivery
- Mortality up to 20%, if maternal VZV infection $\leq 4 - 5$ days before to 2 days after delivery:
 - Mortality rate 3% when rash starts at 0 - 4 days of life
 - Mortality rate 20% when rash starts at 5 - 12 days of life

Postnatal Varicella Infection

- Rash starts at >13 days of life ($\geq 10 - 12$ day of life)
- Usually mild course, mortality rare unless premature newborn or immune-compromised

Varicella Zoster Infection

- Irrespective of the timing of maternal VZV acquisition, infected newborns can further develop zoster during the first year of their life.
- No risk of severe infection for mother/fetus/neonate

Clinical Management

Clinical Presentation

- Mild - resembling chickenpox in older children, vesicular rash with fever
- Severe - disseminated disease with pneumonia, hepatitis, meningoencephalitis or sepsis

Investigations

- Bloods: Blood culture (bacterial), FBC, CRP, LFT, coagulation screen, U&E, blood gas. Send VZV PCR to Virology in separate EDTA (purple) bottle.
- Swabs: Viral/VZV PCR from skin lesions (swab from de-roofed vesicles)
- CSF: If stable enough for LP, send CSF for viral PCR, biochemistry, bacterial culture.
- Remember: A negative CSF result does not rule out infection in the blood, i.e. viraemia
- Other: Consider CXR if respiratory symptoms and cranial imaging / EEG if neurological symptoms

Treatment

1. Mother with VZV symptoms ≥ 21 days before birth that have resolved:
 - No need to isolate mother, but newborn should be hospitalised and isolated for at least 3 days
2. Maternal VZV exposure 20 days to 6 days before birth:
 - Isolate mother and infant together, discharge as soon as possible
 - Give VZIG to newborn, if maternal rash develops in 6 days after delivery

- Provide careful medical surveillance for maternal rash during the first week of life
- 3. Mother with VZV symptoms 20 days to 6 days before birth:
 - Keep mother and infant hospitalised and isolated for at least 3 days
 - Treat newborn with either VZIG or, if unavailable, IVIG as soon as possible within the first 48 - 96 hours after birth.
 - If the newborn does not have any other comorbidity, is fully asymptomatic and the parents are reliable, mother and baby can leave the hospital
 - Provide careful medical surveillance during the first week of life
- 4. Maternal VZV exposure 5 days before birth:
 - Isolation is not needed, discharge as soon as possible
 - Provide careful medical surveillance for maternal rash during the first 2 weeks of life
- 5. Mother with VZV symptoms 5 days before to 2 days after birth:
 - Keep mother and infant hospitalised and isolated for at least 3 days
 - Treat newborn with either VZIG or, if unavailable, IVIG 400 mg/kg as soon as possible within the first 48 - 96 hours after birth.
 - If the newborn does not have any other comorbidity, is fully asymptomatic and the parents are reliable, mother and baby can leave the hospital between administration of immune globulins and start of acyclovir therapy.
 - Treat the newborn with intravenous acyclovir from day 7 after the onset of maternal rash and administer for 10 days. Alternatively, give oral acyclovir in case of no peripheral venous access
 - Provide careful medical surveillance during the first 2 weeks of life
 - Site a central vascular line and administer acyclovir for at least 3 weeks if the newborn develops VZV symptoms despite treatment; search for underlying conditions (congenital immunodeficiency, metabolic disease, viral resistance, etc)
- 6. Mother with VZV symptoms 3 days to 28 days after birth:
 - Indication and duration of hospitalisation and isolation should be decided individually depending on mother and newborn clinical status, parental compliance and social setting
 - Treat newborn with oral acyclovir from day 7 after the onset of maternal rash and administer for 7 - 10 days
 - Provide careful medical surveillance for 2 - 3 weeks after start of symptoms in mother
 - Switch to IV acyclovir and site a central vascular line if the newborn develops VZV symptoms despite treatment; administer acyclovir for at least 3 weeks; search for underlying conditions (congenital immunodeficiency, metabolic disease, viral resistance, etc)
- 7. Asymptomatic newborn in contact with VZV/Herpes Zoster:
 - Identify source of infection; indication and duration of hospitalisation and isolation should be decided individually based on information
 - Maternal serology status unknown:
 - Take urgent serology sample from mother and provide careful medical surveillance of the newborn
 - Mother is seropositive:
 - Newborn has a very low risk of disease and no treatment should be provided
 - Provide careful medical surveillance at home for the next 2 - 3 weeks after contact
 - Mother is seronegative or refuses testing:
 - Treat the newborn with oral acyclovir from day 7 after infective contact and administer for 7 days
 - Provide careful medical surveillance for the next 2 - 3 weeks after contact
- 8. Exposed preterm newborn:
 - Identify source of infection and consider isolation
 - Treat newborn with either VZIG or, if unavailable, IVIG 400 mg/kg as soon as possible within the first 48 - 96 hours after contact (up to 10 days)
 - Treat the newborn with intravenous acyclovir from day 7 after infective contact and administer for 10 days

- Provide careful medical surveillance on NICU for 3 - 4 weeks
 - Site a central vascular line and administer acyclovir for at least 3 weeks if the newborn develops VZV symptoms despite treatment; search for underlying conditions (congenital immunodeficiency, metabolic disease, viral resistance, etc).
9. Neonate < 1 month with a confirmed VZV infection and fever < 38.5°C:
- Exclude inflammatory syndrome and generalised sepsis
 - Hospitalise and isolate pending further assessment
 - Mother with a confirmed medical history of varicella:
 - Low risk of severe varicella disease
 - Treat with oral acyclovir
 - Mother with no history of varicella or status unknown:
 - Treat the baby with IV acyclovir for a minimum of 7 days. Switch to oral acyclovir as soon as observing significant clinical improvement. Can be started on oral acyclovir if symptoms very mild at presentation
 - Provide careful medical surveillance

Breastfeeding:

- No particular contraindications in term newborns