

# Varicella zoster immune globulin use in neonates and infants

Varicella zoster virus can be transmitted perinatally from an infected mother to her child – if the maternal varicella rash appears shortly before delivery, the newborn is at increased risk of developing severe complicated varicella. Of 13 cases of neonatal varicella reported in the literature with onset of maternal rash four days or less before delivery, four died. All 23 cases whose mothers developed a rash five days or more preceding delivery survived (1). In a British study of neonates exposed to maternal varicella perinatally, many of those born up to seven days after onset of maternal rash had no detectable antibody to varicella zoster virus and thus were considered susceptible to severe disease (2).

Maternal zoster does not put neonates at risk of severe varicella. Varicella zoster immune globulin (VZIG) has been shown to prevent or attenuate varicella effectively in immunocompromised patients exposed to the virus (3). When administered to neonates exposed to maternal chickenpox, VZIG effectively attenuates infection, although it has little effect on the rate of infection (1,2). Because of this, advisory committees both in the United States and Canada have recommended the prophylactic administration of VZIG to neonates whose mothers develop varicella between five days before and two days after delivery. It must be noted that severe varicella may occur in neonates despite the appropriate use of VZIG (4-6).

Anecdotal reports of severe varicella in neonates of nonimmune mothers following postnatal exposure to varicella zoster virus have raised the issue of the use of prophylactic VZIG in such infants (7,8). A survey of pediatric infectious disease experts revealed that 38% of those responding would have given VZIG prophylaxis to a neonate postnatally exposed to varicella virus if the mother was not immune (9). This percentage increased among those who had encountered previous cases of severe neonatal varicella. In an accompanying com-

mentary (10), it was pointed out that varicella acquired in the first year of life was more frequently fatal compared with disease in older children, but that the fatality rate remained exceedingly low (8/100,000 cases) (11), and that overuse of VZIG might jeopardize availability of the product for high risk situations.

What are the appropriate uses of prophylactic VZIG in the newborn (Table 1)?

- Because of the greatly increased risk of severe disease if infection is transmitted, newborns of mothers who develop varicella rash between five days before and two days after delivery should receive a 125 U dose of prophylactic VZIG. Some experts would extend this period to seven days antepartum (2).
- Prophylaxis is not indicated for the newborn if the mother develops rash more than seven days before delivery.
- For postnatal exposure in the first month of life to staff, mothers of other children, visitors or other neonates with varicella infection, use of VZIG is not recommended except in the following:
  - neonates born after a pregnancy of less than 28 weeks' duration or who weigh less than 1000 g at birth – they are frequently unprotected despite maternal immunity because of inefficient transplacental transport of antibody before week 28 of gestation;
  - newborns who require intensive care, regardless of maternal immune status or gestational age – these children will often sustain a rapid drop in levels of maternally derived antibody because of diagnostic and/or therapeutic interventions, and may be at risk of more severe disease because of their underlying conditions (9,12);
  - neonates with known or suspected immunodeficiency born to nonimmune mothers.
- VZIG is also recommended for neonates born to nonimmune mothers who are about to be discharged when there are active cases of varicella at home and where exposure is unavoidable. In this situation, the

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**TABLE 1**  
**Indication for varicella zoster immune globulin**

	Neonates		1-12 months of age	
	Immune	Nonimmune	Immune	Nonimmune
Premature infant (<28 weeks)	+	+	±	±
Need for intensive care in NICU	+	+	+	+
Immunodeficiency	+	+	+	+
Normal infant	-	+	-	-
Skin disease	-	+	+	+

*NICU Neonatal intensive care unit*

aim is to avoid disruption of routine care. Administration of VZIG to the mother should also be considered.

- Neonates exposed perinatally to maternal zoster do not need to receive VZIG.
- Use of prophylactic VZIG following exposure beyond the neonatal period should be reserved for those who are recognized as being at increased risk of a severe illness, ie, infants with a severe underlying skin condition, infants with known or suspected immunodeficiency and infants born before 28 weeks' gestation, unless they have been discharged from hospital and have reached term weight.

A history of varicella is a reliable predictor of maternal immunity. In mothers who deny such a history, immune status can be established by a reliable laboratory technique such as ELISA or immunofluorescence. Most adults denying previous varicella infection are found to be seropositive, thus suggesting previous subclinical infection.

Hospitalized children exposed to varicella and given VZIG should be kept in strict isolation for 28 days after exposure since the prophylaxis is not 100% efficacious in disease prevention.

Other aspects of management of neonatal varicella can be found in a recently published statement of the Canadian Paediatric Society (13).

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