

Periventricular-intraventricular hemorrhage outcome

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The second most frequent cause of death in [preterm infants](#) is [Periventricular-intraventricular hemorrhage](#) and is one of the leading causes of cerebral damage in low birth-weight [preterm newborns](#). [Hyaline membrane disease](#) is the most frequent cause of death in preterm infants.

The outcome relates largely to the severity of [periventricular-intraventricular hemorrhage](#), the extent of hemorrhagic and ischemic parenchymal involvement, and complications (e.g., [posthemorrhagic hydrocephalus](#)). Even in the absence of neuroimaging abnormalities, VLBW infants have a high incidence of academic and behavioral problems that persist into adolescence and early adulthood.

Of all patients with intraventricular hemorrhage, those with hemorrhagic intracerebral involvement exhibit the highest rates of mortality and neurologic morbidity and, indeed, account for the vast majority of all neurologic impairment in infants with intraventricular hemorrhage.

Evidence has shown that neonates with hydrocephalus association have more severe damage compared to those without.

Families of preterm children after [periventricular-intraventricular hemorrhage](#) exhibit significantly worse impact on families (IOF) scores compared to families of preterm peers. Worse IOF is associated with severe hemorrhage, neurodevelopmental comorbidities, and socioeconomic status. A family-centered intervention is warranted ¹⁾.

Even in the absence of neuroimaging abnormalities, they have a high incidence of academic and

behavioral problems which persist into adolescence and early adulthood ²⁾.

Positron emission tomography (PET) now provides the capability of measuring regional cerebral blood flow with high resolution and little risk. In this study, we utilized PET in six premature infants (920 to 1,200 g) with major intraventricular hemorrhage and hemorrhagic intracerebral involvement to measure regional cerebral blood flow during the acute period (5 to 17 days of age). Cerebral blood flow was determined after intravenous injection of H₂O, labeled with the positron-emitting isotope, **150 PET** (oxygen 15). Findings were similar and dramatic in all six infants. In the area of hemorrhagic intracerebral involvement, little or no cerebral blood flow was detected. However, in addition, surprisingly, a marked two- to fourfold reduction in cerebral blood flow was observed throughout the affected hemisphere, well posterior and lateral to the intracerebral hematoma, including cerebral white matter and, to a lesser extent, frontal, temporal, and parietal cortex. In the one infant studied a second time, ie, at 3 months of age, the extent and severity of the decreased cerebral blood flows in the affected hemisphere were similar to those observed on the study during the neonatal period. At the three autopsies, the affected left hemisphere showed extensive infarction, corroborating the PET scans. These observations, the first demonstration of the use of PET in the determination of regional cerebral blood flow in the newborn, show marked impairments in regional cerebral blood flow in the hemisphere containing an apparently restricted intracerebral hematoma, indicating that the hemorrhagic intracerebral involvement is only a component of a much larger lesion, ischemic in basic nature, ie, an infarction. This large ischemic lesion explains the poor neurologic outcome in infants with intraventricular hemorrhage and hemorrhagic intracerebral involvement ³⁾.

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