

Infection and brain injury in newborns with congenital heart disease

childhood
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Summary

Newborns born with congenital heart disease show very high rates of subsequent brain injury. Heart disease contributes to immature brains in these newborns, similar to the brains of premature newborns. Since infection increases risk for brain injury in premature newborns, it seems that it might also increase risk for brain injury in newborns with congenital heart disease. This study, however, failed to find a significant link between infection and later brain injury in newborns who had undergone surgery to treat heart disease. This was a prospective study of a cohort of term newborns who required surgery for congenital heart disease within the first month of life. Magnetic resonance imaging (MRI) was performed on 127 patients before surgery, and on 108 patients following surgery. A blinded neuroradiologist scored MRI scans for minimal, moderate, or severe injury to brain white matter and analyzed differences between pre- and post-operative scans. Clinical data was collected to assess the presence of risk factors including infection, and infections were classified as a bloodstream infection, pneumonia, or a surgical site infection. Multivariable logistic regression was used to analyze the statistical significance of the various clinical predictors of brain injury.

What families should know

Newborns with congenital heart disease can be treated with surgery, but even after surgery, they remain more likely to endure brain injury. Such brain injury can impair long-term motor and behavioral development, limiting socialization and communication skills. Unfortunately, hospitals harbor many infectious agents and patients can acquire infections during their stay. Infection can enter the bloodstream, the respiratory passages, or it can remain localized at the site of surgery. This study suggests that hospital-acquired infections may not importantly increase risk for brain injury in newborns with congenital heart disease, but further studies are needed to confirm or eliminate them as a risk factor.

What practitioners should know

Hospital acquired infections are not uncommon: in this study, nearly 20% of the newborns who underwent cardiac surgery acquired an infection. No significant difference in the development of brain injury was observed between newborns who acquired an infection following surgery and those who did not, but practitioners should still be vigilant to reduce hospital acquired infections. A subset of newborns identified after adjusting for disease severity and the absence of stroke did show a significantly increased risk for brain injury upon infection. Thus, a more extensive study is necessary before accepting or eliminating hospital-acquired infections as an important risk factor for brain injury in newborns with congenital heart disease.

Reference

Glass, H., Bowman, C., Chau, V., Moosa, A., Hersh, A., Campbell, A., et al. (2011). Infection and white matter injury in infants with congenital cardiac disease. *Cardiology in the young*, 21, 562-571.