

Cranial sonography for newborn screening: a 10-year retrospective study in 11,887 newborns

Abstract:

We retrospectively analyzed the results of a sonographic cranial screening study, performed between 1985 and 1994 to determine the incidence of intracranial hemorrhage and cerebral anomalies based on obstetrical risk factors. In the Department of Obstetrics and Gynecology of the University Giessen, Giessen, Germany, 94.6 % (n = 11,887) of all children born during the study period were included and underwent sonographic cranial screening within the first 10 days after birth. Cerebral abnormalities were found in 653 (= 5.5 %) cases, and peri-/intraventricular hemorrhages (PIVH, grade I-IV) in 303 cases. Periventricular leucomalacia, porencephaly, subarachnoidal hemorrhage and hydrocephaly were rare (≤ 0.2 %). The Apgar index proved to be a good prognostic factor, particularly at 1 and 5 minutes after birth ($p < 0.0001$). In contrast, correlation between PIVH and cardiotocography, arterial cord blood gases, and pH was poor. We did not observe a higher incidence of PIVH in newborns with growth retardation, preeclampsia and premature ruptures of membranes or prolonged labor. With decreasing gestational age, the frequency of PIVH increased progressively from 0.4 % at 39 weeks to 53.2 % at 27 weeks ($p < 0.001$). We also found a higher risk of intracranial hemorrhage in preterm newborns with amniotic infections (38.1 %, $p < 0.001$). In mature babies, we did not find a difference between the incidence of PIVH and delivery-modes; however, we noted a higher risk of PIVH Grade IV in preterm newborns with breech presentation for vaginal delivery versus caesarean section (38.5 % versus 7.4 %, $p = 0.005$). The incidence of PIVH over this 10 year time period did not increase despite an increasing number of preterm newborns over time. In conclusion, this study, which represents one of the largest patient cohorts studied for PIVH, indicates that neonatal sonographic cranial screening is an important tool to define quality control in obstetrics