The newborn at risk of hypoxic-ischemic encephalopathy: a large Italian multicentre retrospective study on antepartum and peripartum risk factors

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Objective. Hypoxic-ischemic encephalopathy (HIE) is a major cause of neonatal mortality and neurological disabilities, with overlapping antepartum and intrapartum risk factors. We aimed to investigate ante and peripartum risk factors for HIE.
Materials and Methods. A retrospective analysis of singleton, non-malformed pregnancies at ≥ 35 gestational weeks with a neonatal weight ≥ 1,800 g was conducted in three Italian tertiary care hospitals from 2019 to 2022. Cases were defined by arterial cord blood pH ≤ 7.10 and/or base excess (BE) ≤ -12 mmol/L and/or the need for neonatal resuscitation at 10 minutes of life.
Results. 27,187 pregnancies were recruited, including 1,430 cases (5.3%). The multivariate analyses identified maternal age (OR 1.012), pregestational BMI (OR 1.037), gestational age at delivery (OR 1.194), epidural (OR 1.293) and vacuum delivery (OR 2.190) as risk factors for cases. Conversely, having at least one previous vaginal delivery (OR 0.649) and female sex (OR 0.816) represented protective factors. No associations were detected for assisted reproduction conception, induction of labour and neonatal weight. Pathological APGAR scores at 10' and BE values significantly increased the risk of HIE (OR -1.069 and OR -0.313, respectively).
Conclusions. In our study most ante and peripartum risk factors were significantly associated with poor cord blood analysis. However, our results indicate the role of APGAR scores and BE values, rather than pH levels, as prognostic for HIE. It is important to personalize clinical management in relation to specific risk factors. Further follow-up analysis are warranted to evaluate neurological follow-up for long-term outcomes.