

PREDICTING SURVIVAL AFTER SEVERE NECROTISING ENTEROCOLITIS; A CASE-CONTROL STUDY USING NATIONAL SURVEILLANCE DATA

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Aim of the Study: To quantify risk factors for mortality after severe necrotising enterocolitis (NEC) using national surveillance data

Methods: A case-control study was conducted using data collected from two national surveillance databases. No ethics approval was required for this secondary analysis. Cases were all infants that died from NEC in the neonatal period, identified from the Mothers and Babies: Reducing Risk through Audits and Confidential Enquires across the UK (MBRRACE-UK) database in 2013. Controls were surviving infants with severe NEC (as defined by the need for surgical intervention) identified within a national population cohort study conducted from 2013-2014 (BAPS-CASS NEC study). Factors associated with mortality were assessed using univariable logistic regression to calculate unadjusted odds-ratios (uORs) and a multivariable model was constructed to calculate adjusted odds-ratios (aORs).

Main Results: 138 cases and 143 controls were identified. After univariable testing of a number of maternal and neonatal factors, gestational age (in weeks), (uOR 0.92,(0.87-0.98), p=0.006), birthweight (in centigrams), (uOR 0.93,(0.90-0.97), p=0.001) being small for gestational age (SGA, <10th birthweight centile), (uOR 2.15,(1.12-4.11), p=0.021) and being from a multiple birth, (uOR 0.61,(0.33-1.13), p=0.12), reached the threshold of significance for inclusion in the multivariable model. Birthweight was excluded due to its collinearity with gestational age (r=0.9). After likelihood-ratio testing, the final multivariable model included gestational age and SGA only. For every week of gestational age increase, there was 11% decrease in the odds of NEC mortality (aOR=0.89,(0.84-0.9), p=0.001) and being SGA was independently associated with almost three-fold increase in NEC mortality (aOR=2.89,(1.41-5.91), p=0.004).

Conclusion: SGA is an independent risk factor for mortality after severe NEC. These findings may help to identify infants at high-risk of death after NEC in whom a different nutritional strategy may be required. Placental insufficiency may be a crucial determinant of disease severity and/or the infant's ability to recover from severe NEC.