

Review of neonatal hypoglycaemia and adverse neurological outcomes

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Introduction

Neonatal hypoglycaemia is a well-recognized cause of adverse neurological outcomes. While hypoglycaemic brain injury is well reported in the literature there is limited data on the effect of neonatal hypoglycaemia solely with other risk factors for brain injury excluded.

Aims

The aim of study was to evaluate the long-term neurological outcomes in patients with a history of symptomatic neonatal hypoglycaemia and no other risk factors of brain injury.

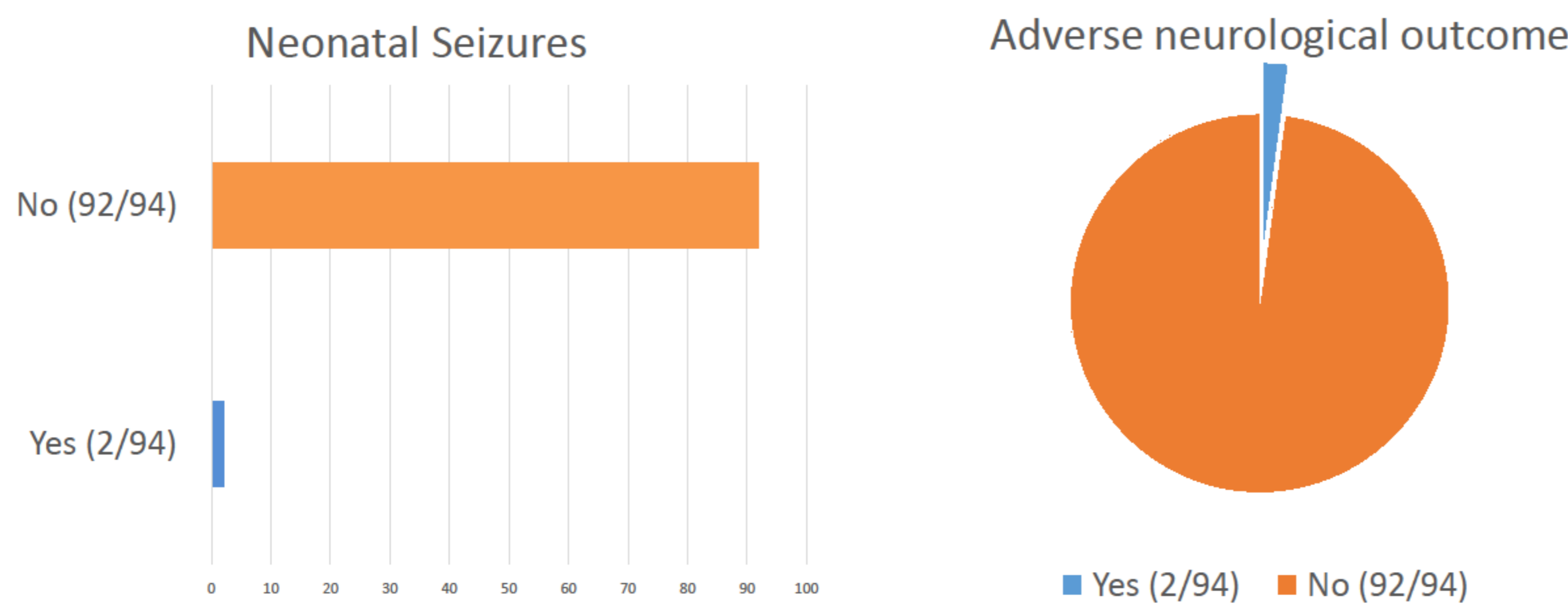
Methodology

- Retrospective cohort study examined the outcome among children with history of symptomatic neonatal hypoglycaemia.
- Babies born from January 2008 to January 2014 admitted to the neonatal intensive care unit at Queens Hospital, Romford, UK: a total 6411 new born infants were identified.
- 13% of neonatal admissions (850/6411) were recorded as having neonatal hypoglycaemia.
- Exclusion criteria (see table)
- 94/855 were identified with solely neonatal hypoglycaemia a risk factor for poor neurological outcome
- Data was reviewed from neonatal discharge summary, community assessments, ophthalmology, paediatric medical notes and laboratory results.
- 2/94 patients were found to have adverse neurological outcomes. These two cases are presented and analysed

Exclusion criteria	Number of patients
Gestation age <37 weeks	518
Birth weight < 2.5kg	108
Birth weight >4.5 kg	20
Infant of diabetic mother	48
Neonatal infection	43
Birth asphyxia	44
Dysmorphic features/ chromosomal abnormalities	24
Congenital heart disease	18
Meconium aspiration syndrome	13
Hyperinsulinism	3
Intestinal obstruction	3
Necrotising enterocolitis	3
Spontaneous intracranial haemorrhage	1
Pneumothorax	1
Maternal illness	1
	1
	1

Results

- 94 neonates with neonatal hypoglycaemia and no other risk factors for brain injury.
- 2/94 patients were found to have adverse neurological outcomes and neonatal seizures.
- The remaining 92/94 had favourable neurological outcome and no neonatal seizures.



Case 1

- Born at 42+3 EmCS for failure to progress
- BW: 3400g
- Apgars: 8 (1 min), 9 (5min) and 10 (10 min)
- Breast fed
- Presented to ED on Day 3 with:
 - Poor feeding
 - 9% weight loss
 - Glucose 0.6mmols
 - tonic-clonic seizures
- Treatment:**
 - dextrose bolus and infusion
 - Midazolam, phenobarbitone and carbamazepine
- Outcome:**
 - followed up to 4 years
 - Abnormal MRI
 - EEG- epileptic form activity
 - severe intellectual disability, cortical visual impairment, microcephaly (<0.4 centile), four limb dyskinetic body movement disorder with central hypotonia and epilepsy

Case 2

- Born at 37+6 by forceps
- BW: 2790g
- Apgars: 10 (1 min), 10 (5min) and 10 (10 min)
- Breast fed
- Presented to ED on Day 5 with:
 - Poor feeding (3 day hx)
 - Glucose 0.6mmols
 - tonic-clonic seizure
- Treatment:**
 - dextrose bolus x2
- Outcome:**
 - followed up to 4 years
 - Abnormal MRI
 - No epileptic activity on EEG
 - HC on 0.4th centile
 - Mild motor developmental delay
 - Attention deficit hyperactivity disorder

Conclusions

- Neonatal hypoglycaemia with no other risk factors for global brain injury can cause adverse neurological outcome.
- Neonatal seizure is a significant predictor of the potential long-term poor outcomes of isolated neonatal hypoglycaemia.
- Further research on the effect of neonatal hypoglycaemia and neonatal hypoglycaemic seizure on long-term neurological outcomes in needed.

References

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