

Outcomes from extremely preterm births

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Abstract

Extremely preterm birth is associated with significant mortality and morbidity. Survival has improved in recent years with 29% of babies admitted for neonatal care at 23 weeks' gestation now surviving to 3 years, increasing to 78% at 26 weeks' gestation. Neurodevelopmental impairment and physical problems do however cause short and long term morbidity in survivors. Risk-lowering strategies which substantially improve outcomes include in utero transfer to a level three centre, antenatal provision of magnesium sulphate and antenatal provision of steroids. A multidisciplinary approach to managing delivery and clear communication between the obstetric and neonatal teams are essential to optimise delivery conditions.

Keywords developmental disabilities; extremely premature; infant; infant premature diseases; neurodevelopmental disorders; preterm births

Introduction

Up to date evidence for the survival and morbidity of extreme preterms (babies born under 28 weeks' gestation) is essential to aid decision making regarding delivery and the provision of neonatal intensive care. This unique patient group has been under close study in recent years¹ but available data lack clarity due to the wide variance both in attitudes towards resuscitation and the denominators employed to report outcomes. The aim of this article is to summarize the current data and outline the benefits of risk-lowering strategies pre-delivery.

Mortality

The most recent collaborative survival data in the UK is from EPICure 2.^{2,3} This national cohort of patients was born in 2006 and has been followed up to 2012. [Table 1](#) demonstrates that survival increases steeply with advancing gestational age. A key finding of this study was that survival is significantly enhanced for babies born in a level three centre with high activity levels. For example, there was a 32% overall antenatal mortality for 22–26 week gestation babies in level one services compared to 15% in level three services. Delivery room deaths also decreased from 16% to 12% respectively. This highlights the benefits of in-utero transfer as an important strategy for improving neonatal survival. Up to date survival data from the National Neonatal

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EPICure 2 – Babies surviving to 3 years

Gestation	22 weeks	23 weeks	24 weeks	25 weeks	26 weeks
Survival if alive at onset of labour (%)	1	15	36	62	75
Survival if admitted for neonatal care (%)	16	29	46	69	78

(Adapted from Moore T, Hennessy EM, Myles J et al. Neurological and developmental outcome in extremely preterm children born in England in 1995 and 2006: the EPICure studies *BMJ* 2012; 345:37961).

Table 1

Audit Programme (NNAP) for 24–31 week gestation babies born 2017 to 2019 is awaited.

Neurodevelopmental impairment

Neurodevelopmental impairment after extremely preterm birth is a common concern.⁴ In actual fact, over 70% of babies born at 25–26 weeks surviving to 3 years are free of significant disability. Disability rates increase with decreasing gestational age and in the UK in 2006 of those born at 23 weeks' gestation, 29% had a severe disability. [Table 2](#) summarises the rates of disability within the EPICure 2 cohort.

Cerebral palsy in particular is often a source of anxiety for parents and clinicians. Approximately 15% of extreme preterms are now expected to be given this diagnosis but the severity is extremely variable. In the EPICure 2 cohort, 43% of those with cerebral palsy had only mild or moderate impairment. Antenatal treatment with magnesium sulphate is now well established as being neuroprotective for the fetus; it reduces the chance of cerebral palsy by 32%. A scientific impact paper from the Royal College of Obstetrics and Gynaecology (RCOG) in 2011 recommended offering magnesium sulphate to all women at risk of delivery before 30 + 0 weeks' gestation.⁵ This is reflected in the current NICE guideline. Unfortunately despite this, uptake in the UK has been poor with NNAP reporting that only 64.1% of eligible mothers in England received it in 2017. The Preventing Cerebral Palsy in Preterm Labour (PRECePT) initiative is a national programme aimed at increasing uptake to 95% by 2020.

More subtle developmental impairments are now increasingly being recognized as extreme preterms progress through school. These children have higher rates of inattention and behavioural difficulties than term controls, as well as lower IQs. Although the majority will be in mainstream school at age 11, many will have special educational needs. In addition, they are more likely to struggle with emotional problems and peer relationships.

Visual impairment among extreme preterms is predominantly due to retinopathy of prematurity. These infants are also more at risk of cortical visual impairment, optic atrophy, refractive errors and strabismus than infants born at term. In the EPICure 2 cohort, 1% were found to have severe visual impairment and 6% had moderate visual impairment. Hearing impairment was less common with 0.2% and 5% of infants having severe and moderate impairments respectively.

EPIcure 2 – Disability at follow up

Gestation		22–23 weeks % (95% CI)		24 weeks % (95% CI)		25 weeks % (95% CI)		26 weeks % (95% CI)	
Motor	Severe	11	(3–25)	5	(2–12)	5	(3–10)	4	(2–8)
	Moderate	0	(0–9)	4	(1–10)	3	(1–7)	2	(0.6–5)
Hearing	Severe	3	(0.1–14)	0	(0–4)	0	(0–2)	0	(0–1)
	Moderate	5	(2–12)	5	(2–12)	5	(3–10)	5	(3–9)
Vision	Severe	3	(0.1–14)	1	(0–6)	0.5	(0–3)	1	(0.2–4)
	Moderate	16	(6–31)	8	(4–16)	6	(3–11)	3	(1–6)
Cognition	Severe	18	(8–34)	11	(6–19)	11	(7–16)	8	(5–12)
	Moderate	13	(4–28)	6	(2–13)	8	(5–13)	4	(2–8)
Communication	Severe	16	(6–31)	7	(3–14)	7	(4–12)	4	(2–7)
	Moderate	11	(3–25)	5	(2–12)	6	(3–10)	4	(2–8)

(Adapted from Moore T, Hennessy EM, Myles J et al. Neurological and developmental outcome in extremely preterm children born in England in 1995 and 2006: the EPIcure studies *BMJ* 2012; 345:37961).

Table 2

Planning at delivery

Management of extreme preterm delivery requires a multidisciplinary approach with clear communication between the obstetric and neonatal teams. Every effort should be made to optimise delivery conditions including in-utero transfer to a level three unit wherever possible and the timely administration of antenatal steroids and magnesium sulphate.

The high risk of mortality and morbidity should be carefully considered in threatened or planned preterm delivery. The family should be counselled by an experienced paediatrician or neonatologist and a resuscitation plan made, particularly at the extremes of viability (22 and 23 week gestations). Often serial counselling will be required as risk changes significantly as pregnancy progresses through these early stages. The British Association of Perinatal Medicine (BAPM) is currently updating its framework regarding the care of extremely premature babies at birth in order to reflect advances in the field in recent years. There is an emphasis on multifactorial risk stratification rather than focusing on gestation alone. Factors such as estimated fetal weight, multiplicity, maternal health (e.g. chorioamnionitis) and the presence of congenital abnormalities should be taken into account. In the absence of other risk factors, the resuscitation of a baby born at 22 weeks should be considered after discussion with the family at a senior level. In the meantime, published

literature, such as that outlined in this article, should be used to counsel parents and decisions should be made in collaboration with them. Close communication between the obstetric and paediatric team is vital to optimising outcomes for these vulnerable babies. ◆

FURTHER READING

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