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Outcome following preterm birth

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Preterm birth currently occurs in approximately 12% of pregnancies and appears to be increasing despite improvements in obstetric care. Improvements in neonatal care have led to increased survival, particularly at extreme prematurity, but survival may be associated with significant morbidity. This may be acute, reflecting the difficulties in supporting an individual in a hostile extrauterine environment to which they should not be exposed, or chronic, reflecting disturbances to fragile, immature body systems. Brain, lungs, intestines and eyes are particularly vulnerable and damage may be severe. For some infants the consequences of this damage may be permanent disability and impairment. Despite this, the limited information currently available suggests that adult outcomes may be comparable with those for infants born at term.

Key words: infant; premature; respiratory distress syndrome; newborn; intraventricular haemorrhage; bronchopulmonary dysplasia; developmental disabilities; retinopathy of prematurity.

In historical terms, saving the lives of babies has not been a priority; in fact the converse has been true. In the 13th century Pope Innocent III made provision for the care of unwanted babies after fishermen had petitioned him when they were no longer able to fish the Tiber as their nets would fill with the bodies of drowned babies. Such provision was rare however and no-one took responsibility for babies. Midwives relinquished care as soon as a baby was born and doctors would not offer care until children were at least 2 years old. Not surprisingly the outlook for children was poor and most succumbed. Queen Anne (1665–1714) is reported to have given birth to 18 or 19 children, the oldest only living into his 11th year. Although many factors influenced the development of neonatal care, the most important contribution came from two French obstetricians, Stéphane Tarnier and Pierre Budin, at the turn of the 19th century. Huge advances were made practically, academically and philosophically, and suddenly care of the newborn became a source of much interest. *The Nursling*, written by Budin, remains a masterpiece from which much can still be learnt.[1]

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Throughout the 20th century services for babies developed slowly but it was not until the last two decades that major advances led to the current services. Now, the majority of hospitals have dedicated neonatal units and many will provide all the care needed for long term support of the most premature infants.

INCIDENCE OF PRETERM BIRTH

The exact incidence of preterm birth is difficult to establish accurately, partly because collection of survival data is frequently by birthweight alone. These data show that there has been a steady increase in the incidence of births at low birthweight in the United Kingdom since 1970 in the face of a falling birth rate.[2] The proportional increase is higher the lower the birthweight. Where national gestational age based statistics are available the same trend is apparent. The US Institute of Medicine has reported a >30% increase in the rate of preterm births since 1981. In that year 9.4% of US babies were born before 37 weeks' gestation; by 2004 this had risen to 12.5%.[3] A Danish study identified a group of 'low-risk' white primiparous women over the period between 1995 and 2004.[4] In this period the incidence of preterm delivery in this 'low-risk' group rose by 51% from 3.8% to 5.7% in comparison to an increase of 20% (from 2.7% to 3.2%) in low-risk multiparous women. This study performed multivariate analysis of potential risk factors and found the most important to be multiple births (OR for all preterm births 14.03, 95% CI 13.75–14.9) with the next most important being primiparity (1.53, 1.49–1.57), smoking (1.52, 1.49–1.55) and in-vitro fertilisation (1.25; 1.19–1.32). These observations and other evidence confirm that this trend is international. Furthermore, there appears to be little that can currently be done to prevent this and an acknowledgement that the responsible factors are complex, multiple and poorly understood.[5]

SURVIVAL

Over the last three decades numerous papers have described the survival of babies born prematurely. Although it might be assumed that this would provide a sound database on which to inform debate, this is, for the more part, not so. The majority of reports have been on small numbers of babies, commonly from only one or a small number of centres. Estimates of survival and morbidity ranged widely. In a review of data available in 1998, over 50 reports were identified.[6] At 22 weeks' gestation mean survival was 1.3% with a reported range of 0% to 12.4%. At 23 weeks, corresponding figures were 13.6% (0–56%); at 24 weeks 26% (0–100%); at 25 weeks 36% (3–86%); at 26 weeks 51% (8–90%).

There are several reasons for this disparity. Many reports came from tertiary centres that may have had widely differing admission criteria. Some may have selected the 'best' infants from feeder units and others may only have received the 'worst'. Some may have provided care for infants from an affluent, stable population and others for a poor, primarily immigrant population. Reports from different periods in time are difficult to compare as survival has increased over time. In many reports numbers were small. At extreme prematurity even the largest centres would have only admitted a small number of babies at any gestation and wide difference in survival rates could be accounted for by the outcome of only a small number of babies.

In a systematic review of published data a significant selection bias and a highly significant difference in survival estimate has been noted depending on the group for