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Analgesia in the neonate

The traditional reluctance to prescribe analgesic drugs to alleviate postoperative or other pain in neonates has recently been challenged by pain researchers.¹ The main reasons for the reluctance to prescribe are doubts about whether neonates feel pain to the same extent as adults and concerns over the potentially harmful effects of powerful analgesics, particularly on the respiratory system. Most doctors have naturally based their opinions about whether neonates experience pain on clinical observation.

Even after major operations most babies who are not hypoxic or hypovolaemic settle down quickly and sleep peacefully for normal periods, especially if they can be fed early and orally. Burton and Derbyshire in 1958 described a severe withdrawal state in a young infant, which they called a "sleeping fit."² They postulated that it was caused by the excruciating pain of acute glaucoma, but this phenomenon has not been described elsewhere, and no one has suggested that this mechanism operates regularly in babies.

There are theoretical reasons for suspecting that neonatal perception of pain is reduced in proportion to the degree of myelination of the central nervous system. Neonates also have immature receptors and neurological pathway development, and nerve transmission in response to pain seems to be modified in immature nerve tissue.^{3,4} They also have circulating concentrations of β endorphins higher than those in adults, and the immature blood brain barrier may allow these easier access to neuronal tissue.⁵ On the other hand, acute painful stimulation such as circumcision, which is often performed without anaesthesia in neonates in the United States, produces an obvious immediate response of breathholding, crying, and body movement. The observer is left in no doubt that the baby is experiencing pain.

Increasing acceptance that neonatal pain requires treatment has been shown from the results of a recent survey of members of the Association of Paediatric Anaesthetists (F Dorman, personal communication). More than half (56%) of the 60 replying said that they used opioid analgesia in the neonate either occasionally or often. Though this is safe in babies being ventilated, it is associated with an important incidence of respiratory depression in those breathing spontaneously. This is probably because of altered pharmacokinetics and increased sensitivity to opioids related to the immature blood brain barrier and glucuronide metabolism. Apnoea in the neonate is potentially catastrophic, and even prolonged apnoea may remain undetected despite modern monitoring systems.⁶ Personnel skilled at tracheal intubation may not be immediately available, and hypoxic cerebral damage may occur. Infusions of opioids may be safer than

bolus doses, and regional block may be safer still. That opioids may be dangerous in spontaneously breathing neonates does not necessarily mean that they should not be used; it might be argued that the evidence of severe pain justifies elective tracheal intubation and ventilation when opioids are to be given.

Little work has been published on the behavioural response to pain in infancy, and clearly more research is required. No single independent variable—whether it be crying, facial expression, body movement, or heart rate—is likely to correlate closely with pain, since these variables are affected by so many other factors; but analysis of several simultaneous responses may be helpful. Owens and Todt studied the effect of a heel lance on crying and heart rate in neonates and showed a statistically significant correlation despite wide baseline variability for each individual measure.⁷ A similar approach was used to study the effects of local anaesthesia on reactions to circumcision,⁸ and more recently metabolic and hormonal responses to operations have been shown in the newborn. Only with the results of such research can we produce firm guidelines for using potent analgesics in neonates.

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Diet of young children and cardiovascular disease

Should the diet of young children be changed to reduce their chances of developing cardiovascular disease? The National Advisory Committee on Nutrition Education (NACNE) thought so in 1983 and produced nutritional guidelines for the whole population,¹ but the Committee on the Medical Aspects of Food Policy (COMA) in its recommendations of the next year specifically excluded children under 5.² This split extends downwards, and community dietitians are keen to promote healthy eating throughout the community, whereas paediatric dietitians are cautious about changing established feeding practices for children.^{3,4}

Any important changes in dietary advice should benefit health, and any disadvantages, either predictable or unforeseen, should not outweigh the putative benefits. The COMA recommendations meet these criteria for adults and children over 5. They state that the amount of food energy as fat should not be more than 35%, that the saturated to unsaturated fatty acid ratio should be about 0.45, that fibre rich food should be increased and salt intake restrained, and that obesity should be avoided. Some of these rec-