The labour ward analgesic service at King Edward VIII Hospital, Durban

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Abstract **The provision of analgesic services to the labour ward at King Edward VIII Hospital was studied during a 1-week period. Of 249 patients, 113 (45%) received no analgesia whatsoever. Intramuscular pethidine was the commonest form of analgesia and was used in 97 patients (39%). Thirty-six patients (14%) received epidural analgesia and only 4 inhalational analgesia using nitrous oxide and oxygen (Entonox). A significant proportion of patients who received pethidine were given the drug between 1 and 3 hours before delivery, increasing the potential for opiate-related neonatal depression. Of the patients given opiate analgesia, 22 (23%) proceeded to caesarean section and could have been at increased risk of aspiration of gastric contents owing to delayed gastric emptying caused by the opiate. One hundred and eleven mothers (76%) who had an obstetric indication for epidural analgesia were denied it because of lack of medical staffing.**

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The provision of analgesia to women in labour has become an integral part of peripartum care. Techniques provided range from education and reassurance, psychoprophylaxis and inhalational and systemic analgesia to local and regional blockade. While the ideal method remains to be established, it should ensure that maternal and fetal health are not endangered, that uterine contractions are not decreased and that the process of normal labour is not delayed.

Before 1970 analgesia was often provided by a parenterally administered opiate, usually intramuscular pethidine. During the past 20 years epidural anaesthesia has become increasingly popular owing to maternal demand and the availability of personnel. In addition to pain relief, there are a number of obstetric indications for epidural analgesia, including first deliveries, breech presentations, preterm labour, induced labour, hypertensive disorders of pregnancy and multiple gestation. The provision of an adequate epidural service is therefore warranted for any labour ward. Furthermore, the Reports on the Confidential Enquiries into Maternal Deaths in the UK continue to highlight anaesthesia as an identifiable cause of maternal mortality, although in the most recent report it was the least common identifiable cause.[1] This dramatic decrease is probably due to increased anaesthetic staffing levels, more experienced practitioners in obstetrics, and the increased use of regional anaesthesia for caesarean section. Difficulty with or failure of tracheal intubation and aspiration of gastric contents are the two major factors contributing to maternal death, and both can be avoided if operative delivery is performed under regional anaesthesia.

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The aims of the present study were to analyse modes of analgesia used in the labour ward at King Edward VIII Hospital and to determine the appropriateness and adequacy of the service, particularly in relation to the obstetric population.

Method and results

The records of each patient who gave birth in the labour ward during a 7-day period were scrutinised by one of the authors (H.D.R) within 24 hours of delivery. Choice of analgesia was left to the obstetric registrars, who were unaware of the study. Data collected included maternal age, parity, duration of labour, method of administration of analgesia, mode of delivery and obstetric condition (Table I).

TABLE I.
Age, weight, parity, duration of labour and mode of delivery (mean ± SD or range)

Age (yrs)	24,2 ± 5,7
Weight (kg)	72,6 ± 12,5
Parity	1,3 (0 – 8)
Duration of labour (h)	11 (1,3 - 29,3)
Mode of delivery	
Vaginal delivery	180
Caesarean section	69

During the course of the study week there were 290 deliveries. Fifteen patients underwent elective caesarean section, while 26 who were not in labour had an emergency caesarean section. Of the remaining 249 mothers who formed the basis of the study group, a further 69 proceeded to operative delivery giving an overall caesarean section rate of 38%.

Of the 249 mothers for whom analgesia was a consideration, 113 (45%) received no analgesia, 36 (14%) an epidural block and 97 (39%) an opiate as the primary mode of analgesia. Inhalational analgesia with nitrous oxide and oxygen (Entonox) was used in only 4 patients (2%). Of those patients who received an opiate for analgesia, 50% did so between 1 and 3 hours before delivery. Of the 68 caesarean sections performed after the onset of labour, 61 (90%) were done under general, 4 under epidural and 3 under spinal anaesthesia. Method of analgesia did not significantly affect the outcome of labour (Table II), and there were no significant differences in outcome of labour for primiparas ($\chi^2 = 1,15$) or hypertensives ($\chi^2 = 2,23$).

The numbers of epidurals indicated for specific obstetric conditions and of epidurals actually performed in these situations are set out in Table III. Of the 36 patients who received epidural analgesia, 10 proceeded to caesarean section, and in 6 of them this was performed under general anaesthesia (in 4 cases the epidural had not been topped up, 1 patient had a unilateral

TABLE II.
Method of analgesia and outcome of labour

	No analgesia	Opiate	Epidural
Vaginal delivery	78	74	26
Caesarean section	35	23	10

$\chi^2 = 1,37$; not significant.

TABLE III.
Epidurals indicated for specific obstetric conditions and epidurals performed

	Epidural indicated	Epidural performed	%
Primipara	94	27	28,7
Breech	11	1	9,1
Preterm	41	3	7,3
Induction	17	7	41,2
Hypertension	51	16	31,4
Multiple gestation	5	1	20
Total*	146	35	24

*Of the 36 patients undergoing an epidural, one had an epidural for pain relief only and is excluded. Some patients had more than one indication for an epidural.

block insufficient for operative delivery, and in the 6th patient the epidural catheter had been dislodged).

Discussion

During 1990 there were a total of 14 791 deliveries at King Edward VIII Hospital, representing a weekly average of 284. Of the annual total 790 had elective and 4 646 emergency caesarean sections, giving an overall caesarean section rate of 36,7%, which is in keeping with previous years and reflects the tertiary referral nature of the obstetric unit. If adjusted for the number of deliveries (approximately 10 000) in peripheral clinics and at home the caesarean section rate would be lower. While the present study scrutinised modes of analgesia offered to a small subset of the total number of patients delivered, we consider the group to be representative of the whole year.

Intramuscular opiates remain the commonest form of analgesia, because of their simplicity of administration. Opiates, however, are known to be the most significant cause of delayed gastric emptying in pregnancy and it must be accepted that they put the patient at increased risk of aspiration should labour proceed to caesarean section.[2] Of equal concern is that 50% of patients who received pethidine in this study did so 1 - 3 hours before delivery, a time which is associated with significant neonatal respiratory depression at delivery.[3] The use of nitrous oxide plus oxygen is unpopular among midwives in our labour ward because of the time required to instruct our patient population properly in its use.

The low percentage of mothers who received epidural analgesia reflects the present extent of the epidural service provided by the Department of Anaesthesia, which is limited to an on-site registrar supervised by a more senior registrar during weekdays only. The two registrars, the more senior of whom also supervises the obstetric theatre registrar, represent 2 of 30 registrars providing the anaesthetic service to the hospital. No epidural service is provided at night or over weekends except in exceptional circumstances. The limited epidural service (which results from insufficient staff) meant that in 1990 only 1 165 (8%) patients had an epidural anaesthetic despite the tertiary referral nature of the institution. Of major concern was the number of patients in the study who had a specific obstetric indication for this form of analgesia but were denied it. Epidural analgesia improves neonatal condition in breech presentation and delivery of twins, but was not offered to 11 mothers with a breech presentation and 5 who gave birth to twins. For the hypertensive patient, epidural analgesia improves placental blood flow, may assist haemodynamic control during labour, and is the preferred technique for anaesthesia should the patient proceed to caesarean section, which is more likely than in normotensive women. Despite this epidural analgesia was administered to less than one-third of the hypertensive patients studied.

Of the 94 primiparas, 21 had a normal vaginal delivery with no analgesia, 46 opiate analgesia and 27 an epidural. Since the introduction of epidurals concern has been expressed by obstetricians that there has been an associated increase in instrumental vaginal delivery. This subject has been reviewed recently by Chestnut,[4] who concluded that the use of higher concentrations of epidural bupivacaine (0,5%) increases the incidence of instrumental delivery when compared with intramuscular pethidine.[5] Maintenance of an epidural bupivacaine infusion (0,125%) beyond 8 cm cervical dilatation will provide profound second-stage analgesia but will prolong the second stage and double the incidence of instrumental vaginal delivery (52% v. 27%; $P < 0,05$).[6] However, the use of low-dose infusion of local anaesthetic combined with small doses of epidural opiate neither prolongs the second stage of labour nor increases the risk of instrumental delivery,[7] although with such low doses second-stage analgesia may be inadequate. More recently, Vertommen *et al.*[8] demonstrated in a randomised multicentre study that epidural bolus administration of bupivacaine (0,125%) with adrenaline (1:800 000) decreased the incidence (24% v. 36%; $P < 0,01$) of instrumental delivery owing to the addition of the opiate sufentanil (10 - 30 μg). They attributed this reduction to a decreased total dose of bupivacaine (34 ± 16 mg v. 42 ± 19 mg; $P < 0,001$) and subsequent decreased intensity of motor blockade. Other advantages of epidural opiates include a reduction in the incidence of shivering[9] and an improved sense of maternal well-being.[10]

In summary, the study presented here shows that the analgesia service provided to the labour ward at King Edward VIII Hospital is at present grossly inadequate. In particular, a high proportion (76%) of mothers with a specific indication for epidural analgesia were denied it. Since in the majority of these cases the alternative was the traditional use of parenteral opiates, often badly timed, many patients underwent surgical delivery with an increased risk of aspiration. There is a clear need to extend the epidural service, and while the provision of syringe or volumetric infusion pumps will facilitate increased use of epidural infusions of low concentrations of combined local anaesthetic and opiate solutions, the analgesic service is unlikely to be significantly improved without the provision of additional staff.

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