Obstetric epidural analgesia in Hong Kong

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We conducted a survey to determine the status of obstetric epidural analgesia services in Hong Kong's public hospitals and describe an example of a 24-hour service at the Prince of Wales Hospital. A review of 695 anaesthetic records of parturients who received epidural analgesia from July 1995 through June 1996 was undertaken. Nine hospitals provide epidural analgesia for labour pain but only four have a 24-hour service. The epidural analgesia rate at the Prince of Wales Hospital was 12%, consistent with the median rate of 10% in Hong Kong. The incidence of adverse effects of this method at our institution was similar to figures reported in the literature. Our review also suggests that epidural analgesia for labour pain is well accepted by local women. Inadequate funding and manpower resources appear to be limiting the implementation of after-hour services in Hong Kong hospitals. Cultural and racial factors and a lack of public awareness and education may also contribute to the low epidural analgesia rate in Hong Kong.

HKMJ 1996;2: 390-5

Key words: Anaesthesia, obstetrical; Analgesia, epidural; Data collection; Hong Kong

Introduction

Epidural analgesia is a highly effective method of providing pain relief in labour.[1] Our experience and observations suggest that this method is less commonly used in Hong Kong than it is in the West. The reasons for this may include racial and cultural differences, and a lack of public awareness. However, inadequate facilities or resources in Hong Kong hospitals may also be a contributing factor. The purpose of this paper is to determine the availability of obstetric epidural analgesia for labour pain in Hong Kong public hospitals, and to describe a 24-hour obstetric anaesthesia and analgesia service at a local major teaching hospital.

Methods

Local survey of obstetric epidural analgesia

A survey was conducted on the availability of epidural analgesia for labour pain at 11 Hong Kong Hospital Authority hospitals that are known to have an obstetric service. A questionnaire was sent to the Chief of Service or consultant at the department of anaesthesia of each of these hospitals. The first eight questions were aimed at obtaining information regarding the obstetric epidural analgesia service available, while the last two were "open questions" that attempted to elicit comments and recommendations on any difficulties encountered during the development of epidural analgesia services.

Review of service at the Prince of Wales Hospital

Organisation

The Prince of Wales Hospital is a 1500-bed tertiary referral centre with an obstetric unit that manages more than 7000 deliveries annually. A 24-hour obstetric anaesthesia and analgesia service is provided by the Department of Anaesthesia and Intensive Care. A team consisting of a senior anaesthetist and an anaesthetic trainee (medical officer) provides a service for elective and emergency Caesarean sections, epidural analgesia, other peripartum surgery, and consultations to the acute pain service. After hours, the service is covered by a dedicated resident anaesthetic trainee. The senior anaesthetist on duty in the main operating theatre provides extra cover for difficult cases and a consultant anaesthetist is on-call from home. All parturients who receive epidural analgesia are followed up for at least 24 hours post-partum.

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Selection of analgesic method

Parturients arriving in the delivery suite are first assessed by the midwives who introduce and explain the available methods of analgesia (Table 1). All requests for epidural analgesia are then referred to the anaesthetic team on duty who perform a medical assessment and provide further explanation. Many of these parturients have been educated on the different methods during antenatal classes where both written and visual information are available.

There are several ways to administer epidural analgesia (Table 2). In our unit, continuous epidural analgesia is the most commonly used technique (Appendix). Alternative techniques include intermittent top-ups of 0.1% to 0.25% bupivacaine administered by the anaesthetist and recently, combined spinal-epidural (CSE) analgesia has also been introduced. The usual CSE regimen uses intrathecal bupivacaine 2.5 mg with fentanyl 0.025 mg followed by subsequent epidural infusion using the above regimen. The choice of technique is determined by the attending trainee or senior anaesthetist. Other methods of obstetric analgesia such as relaxation techniques, breathing exercises, entonox (50% nitrous oxide in oxygen) inhalation, and intramuscular opioid are managed and supervised by the obstetricians and midwives.

Review of anaesthetic records

Data including the total number of deliveries, the proportions of the different methods of delivery, and the number of cases of epidural analgesia from July 1995 through June 1996, were retrieved from the obstetric database maintained by the midwives. The anaesthetic records of all parturients who received epidural analgesia over the same period were reviewed. The incidence of complications and adverse effects including inadvertent dural puncture, systemic toxicity from local anaesthetics, hypotension (systolic blood pressure < 90 mmHg), post-dural puncture headache, backache, persistent leg weakness or paraesthesia, pruritus, and urinary retention were obtained from the anaesthetic records. In addition, the modes of delivery in the epidural group were recorded and the overall maternal satisfaction was assessed according to a four-point scale: excellent, good, fair, and poor. All data was collected prospectively and recorded during the course of labour analgesia and routine post-partum follow up.

Results

Survey results

All hospitals responded to the survey (Table 3). Two hospitals did not provide epidural analgesia for labour pain. Four public hospitals provided a 24-hour obstetric epidural analgesia service, but only three have a dedicated anaesthetist for this service after-hours. Of the others, three did not have a dedicated anaesthetist even during office-hours. The median epidural analgesia rate in Hong Kong was 10% (range, 4%-50%). The most common reasons given for difficulty encountered during the establishment and running of the epidural service were inadequate funding and manpower problems.

Review of obstetric data and anaesthetic records

There were 7340 deliveries at the Prince of Wales Hospital over the 12-month period. The Caesarean section rate (elective and emergency) was 17% and the instrumental delivery rate was 15%. The respective epidural and spinal anaesthesia rates were 67% and 13% for elective, and 45% and 24% for emergency Caesarean sections. General anaesthesia was provided for the remainder.

Epidural analgesia was provided for 825 parturients. This represented 11% of all deliveries and 12% of women in labour. Of the parturients who received epidural analgesia, 659 (80%) anaesthetic records were available for analysis; 166 records were excluded because they were either incomplete or missing. Combined spinal-epidural analgesia was used in 4% and epidural analgesia (96%) was administered as either a continuous infusion (75%) or intermittent top-ups by anaesthetist (21%). The Caesarean section and instrumental delivery rates were 47% and 28%, respectively,

Table 1. Methods of obstetric analgesia available at the Prince of Wales Hospital

1. Exercises to promote relaxation and distraction
2. Intermittent self-administration of entonox (50% nitrous oxide in oxygen)
3. Intramuscular pethidine
4. Epidural analgesia

Table 2. Methods of epidural administration

1. Single bolus
2. Intermittent bolus injection
3. Continuous infusion
4. Patient-controlled epidural analgesia
5. Combined spinal-epidural analgesia

in parturients who received epidural analgesia. Table 4 shows the incidence of adverse effects and complications of epidural analgesia. Maternal satisfaction was rated as excellent or good by 79% of parturients who received epidural analgesia during labour, while 10% rated it as fair and 2% as poor. Nine per cent were non-committal.

Discussion

Obstetric epidural analgesia is available in nine of the 11 public hospitals surveyed, although not every hospital provides a 24-hour service. Some of these hospitals have only started this service within the past two years. Caritas Medical Centre has the highest epidural analgesia rate during labour (50%). The consultant attributed this high rate to the enthusiasm of a live-in staff member who dedicated much of his personal time to the service. Although the regional anaesthesia rate for Caesarean section was 75% at our institution, the epidural analgesia rate during labour was only 12%, which is consistent with the median epidural rate of 10% in Hong Kong. In a recent survey of maternity units in the United Kingdom, the epidural rate for labour was 19.7%.[2]

There may be several reasons for the lower incidence in Hong Kong. Firstly, the provision of this method of obstetric analgesia is relatively new. Many units are only starting to establish an obstetric anaesthesia and analgesia service. Lack of familiarity (patient and staff) with epidural analgesia may also contribute to the low rate. Public ignorance of its availability and misconceptions about the safety and effects of epidural analgesia may also have reduced the popularity of this method. This was exemplified by one respondent who stated "scepticism" and a "wait and see attitude" among parturients as a reason for their low epidural rate. The comment was made that "if one parturient refuses, others in the row of beds will also refuse epidural analgesia." Epidemiological studies to determine the level of awareness and knowledge of the local population about epidural analgesia may help clarify possible reasons and highlight areas requiring improved public education.

Pain is a multidimensional phenomenon involving physiological, psychosocial, cultural and racial factors. Chinese parturients may have different expectations of labour and pain compared with Westerners, and may be less likely to request epidural analgesia.[3] A recent study found that only 4% of Chinese would request the use of local anaesthetic for labour pain, compared with 53% of Anglo-Americans and 35% of Scandinavians.[3] Asian patients have been shown to have lower post-operative analgesic requirements than do European patients.[4] The influence of cultural and racial factors on analgesic requirements may explain some of the differences in obstetric epidural analgesia rates. Differences in expectations may also apply to the midwives and medical staff in Hong Kong, who could be less inclined to offer more invasive methods of analgesia.

Resource constraints are another major determinant of availability of obstetric epidural analgesia services. One respondent stated "inadequate manpower resources" as the reason for not having an obstetric epidural service at his hospital. Almost all hospitals mentioned difficulty in developing the service because

Table 3. Status of obstetric epidural service in various Hong Kong hospitals

Hospital	Estimated annual deliveries	Epidural service	Epidural rate %	No. of years in operation
Prince of Wales	6000-8000	24-hr	12	> 5
Pamela Youde Nethersole	4000-6000	Limited after-hr	16	> 5
United Christian	2000-4000	24-hr	6	< 1
Caritas Medical Centre	2000-4000	24-hr	50	1-2
Our Lady of Maryknoll	1000-2000	Office-hr	10	< 1
Kwong Wah	4000-6000	Up to 10 pm	8	> 5
Tuen Mun	6000-8000	Office-hr	4	1-2
Queen Elizabeth	4000-6000	Office-hr	8	3-4
Tsan Yuk	4000-6000	24-hr	14	> 5
Princess Margaret	4000-6000	Not available	-	-
Queen Mary	500-1000	Not available	-	-

of the inadequate allocation of funds and manpower, as opposed to any lack of expertise or administrative support. Consequently, most public hospitals were unable to offer a regular obstetric epidural service, especially after-hours.

It is difficult to perform an accurate cost analysis of this method of analgesia, while many direct and indirect costs remain unknown. Even the cost benefit of epidural analgesia has not been fully established.[5,6] The direct cost may differ among institutions, depending on the services provided and equipment used. The indirect cost of treating complications and sequelae of epidural analgesia is unclear, especially when the effects of epidural service on obstetric outcome and maternal morbidity remain controversial. Salary costs resulting from changes in staff workload due to epidural analgesia are difficult to estimate because the workload is not constant. Finally, it is difficult to assign a cost benefit to cases where epidural analgesia does improve maternal or foetal outcome, and impossible to quantify patient satisfaction in terms of a monetary equivalent.

In our review of anaesthetic records, there were no cases of permanent disability. The incidence of most adverse effects and complications such as maternal hypotension, post-dural puncture headache, and inadvertent venous puncture in our parturients was similar to previous reports.[7-11] Our accidental dural puncture rate was 2%, slightly higher than the average reported incidence (1%).[12-14] This rate may be acceptable at a teaching hospital where the majority of the epidurals are performed by anaesthetic trainees.

The incidence of backache on the second postpartum day in our series was 13%. Several retrospective surveys have suggested an association between epidural analgesia and backache.[15-17] The higher incidence of backache has been attributed to the stressed postures during labour which may be exacerbated by epidural analgesia.[15] Recent prospective studies, however, have indicated that epidural anaesthesia and analgesia are not associated with an increased incidence of prolonged backache.[18,19]

A major concern of epidural analgesia is its potential effect on the duration of labour and mode of delivery. Several studies have reported that epidural analgesia results in a prolonged labour, higher incidence of assisted vaginal delivery, and increased Caesarean section rate.[20-22] However, all of these studies were compromised by methodological limitations. While our incidence of Caesarean section (47% vs 17%) and instrumental delivery (28% vs 15%) were higher in the epidural group than the overall rates, no conclusion can be drawn as the epidural group and the total obstetric population are not comparable. There are many other factors that influence the outcome of labour, including the likelihood of more difficult and complicated labour in the epidural group and differences in obstetric management.

Seventy-one patients (11%) developed urinary retention in the post-partum period and one patient complained of urinary incontinence. In all cases, the problem resolved spontaneously or required transient bladder catheterisation. It is not possible to infer a causal association between urinary retention and incontinence and epidural analgesia, as both conditions also occur in parturients not receiving epidural analgesia, and there is no data from a matched control group.[8,23]

Permanent neurological complications, although rare, may lead to severe disability. Fourteen patients who received epidural analgesia developed transient paraesthesia and/or weakness in the lower limbs. They were not investigated as their symptoms were minor and all recovered spontaneously over one to three days. The incidence of neurological complications lasting more than six months in the obstetric population has been reported to be 1 in 2500[24] and permanent neurological disability was reported to occur in 1 of every 500 000 deliveries,[8] regardless of the method of anaesthesia and analgesia. In a recent prospective study, epidural analgesia was considered contributory to a

Table 4. Side effects and complications associated with epidural analgesia at the Prince of Wales Hospital 1995-96 (n=659)

Complication/problem	No. of patients (%)
Venous puncture	34 (5)
Difficult catheter placement	27 (4.1)
Dural puncture	14 (2.1)
Post-dural puncture headache	4 (0.6)
Blood patch	1 (0.15)
Hypotension	28 (4.2)
Backache	84 (12.7)
Leg paraesthesia/weakness	14 (2.1)
Urinary retention	71 (10.8)
Urinary incontinence	1 (0.15)
Pruritus	5 (0.8)
Nausea/vomiting	2 (0.3)
Leg cramps	1 (0.15)

neurological disorder only in 1 of 13 000 deliveries.[24] While traumatic mononeuropathy is the most common neurological complication due to epidural analgesia, the majority of patients recover completely.[8,25]

Maternal satisfaction with analgesia was rated as excellent or good in 79%, and just 2% rated their satisfaction as poor, indicating maternal acceptance of this method of analgesia. Although many parturients may have misconceptions regarding epidural analgesia, those who received this method of analgesia appeared to have had a positive and favourable experience.

Conclusions

Most public hospitals in Hong Kong provide an obstetric epidural service, although only a few are able to continue this service after-hours. Limited resources allocated for this purpose appear to be the limiting factor. This difficulty may be overcome in the future when the Hospital Authority highlights obstetric anaesthesia and analgesia as a priority area for development and improvement. At present, the epidural analgesia rate in Hong Kong is lower than reported rates, and the explanation is likely multifactorial. Possible reasons include cultural and racial factors, lack of public awareness, and prevailing misconceptions about epidural analgesia. Further studies may elucidate the relative importance of these factors and highlight areas where better public education about epidural analgesia would be of value.

Acknowledgments

We wish to thank the midwives at the Prince of Wales Hospital for their assistance in data collection and our colleagues from the various hospitals that participated in the survey.

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Appendix

Continuous epidural analgesia protocol

1. Preload with 500-1000 ml intravenous Hartmann's solution or normal saline.
2. Locate the epidural space at the L2-3 or L3-4 interspace using Tuohy needle.
3. Pass epidural catheter via the needle leaving 3-5 cm of catheter in the epidural space.
4. Give a test dose of 3 ml lignocaine 2% with adrenaline 1:200 000.
5. Establish analgesia by titrating bupivacaine 0.125-0.25% with or without fentanyl 2-5 μg/ml or pethidine 1-2.5 mg/ml.
6. Maintain analgesia by continuous epidural infusion of bupivacaine 0.1% with fentanyl 2 μg/ml titrated at 5-15 ml/h according to patient requirements.
7. Provide additional bolus top-ups of bupivacaine 0.125-0.5% in 3-5 ml boluses according to the patient's requirements.
8. Continue epidural infusions through the second stage of labour.

Monitoring and nursing instructions

1. Monitor non-invasive arterial pressure every five minutes for a minimum of 20 minutes after every epidural top up and then hourly.
2. Assess the level of neural block hourly.
3. Monitor foetal cardiotocograph continuously.
4. Inform anaesthetist if the systolic blood pressure falls below 90 mm Hg, the block advances higher than T6, if analgesia is inadequate, or if other related problems arise.

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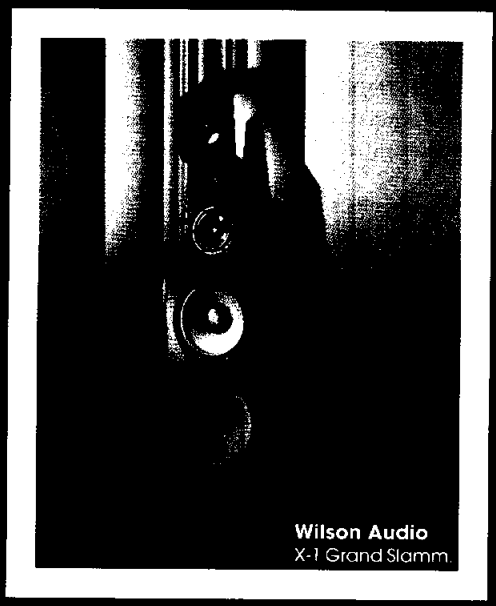
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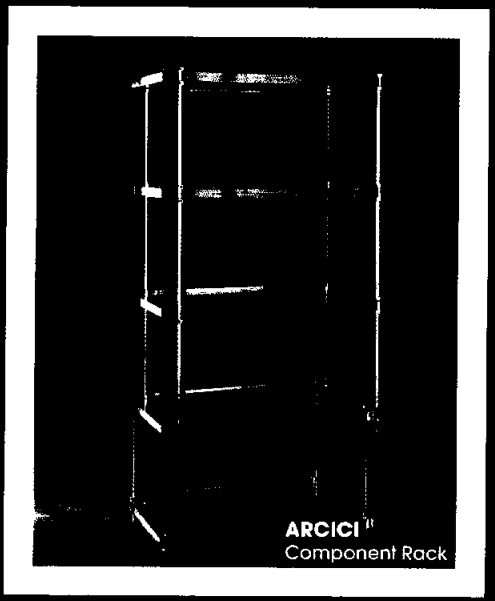
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