Anaesthesia for Operative Deliveries at the University Hospital of the West Indies

A Change of Practice

A Crawford-Sykes[1], M Scarlett[1], IR Hambleton[2], M Nelson[1], C Rattray[3]

ABSTRACT

There has been an increasing trend worldwide to use regional anaesthesia for operative deliveries. The Confidential Enquiry into Maternal Deaths in the United Kingdom has demonstrated a steady decline in the anaesthesia-related deaths since the introduction of regional anaesthesia. There are lower morbidity profiles in mothers delivering under regional anaesthesia as well as better infant Apgar scores. In 1997, a decision was taken to have at least 60% of all elective Caesarean sections done at the University Hospital of the West Indies (UHWI) performed under spinal anaesthesia. This is a review of the anaesthetic technique for Caesarean sections at the UHWI since 1996. The Deliveries and Anaesthetic Books on the labour ward were reviewed and the type of anaesthesia for elective and emergency Caesarean sections recorded for the period January 1996 to December 2001. At the beginning of the period under study, more than 90% of the Caesarean sections were being done under general anaesthesia. By the middle of 1998, spinal anaesthesia was more commonly employed than general anaesthesia for Caesarean sections and by December 2001, more than eight out of every ten Caesarean sections were being done under spinal anaesthesia. The main reasons for the successful change of practice were that it was consultant-led, there was good communication between relevant departments, the junior staff were properly trained, there was a consistent supply of appropriate drugs and there was a high level of patient satisfaction.

La Anestesia en los Partos Operativos en el Hospital Universitario de West Indies

Un Cambio de Práctica

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RESUMEN

Ha habido una tendencia creciente mundial a usar la anestesia regional en los partos operativos. La Encuesta Confidencial sobre las causas de las muertes maternas en el Reino Unido, ha demostrado un descenso constante de los casos de muertes relacionadas con la anestesia, a partir de la introducción de la anestesia regional. Los perfiles de morbosidad son más bajos en las madres que dan a luz con anestesia regional, en tanto que los infantes presentan una mejor puntuación Apgar. En 1997, se toma la decisión de que al menos el 60% de todas las secciones cesáreas electivas en el Hospital Universitario de West Indies (UHWI) fueran realizadas bajo anestesia espinal. El presente trabajo constituye un resumen que examina la técnica anestésica aplicada en las cesáreas practicadas en el UHWI desde 1996. Se examinaron los Registros de Partos y Anestesia del salón de partos, tomándose nota del tipo de anestesia usado en las cesáreas electivas y de emergencia en el período de enero de 1996 a diciembre de 2001. A principios del periodo bajo estudio, más del 90% de las secciones cesáreas se hacían con anestesia general. A mediados de 1998, la anestesia espinal se empleaba más comúnmente que la anestesia general en las cesáreas. Y para diciembre de 2001 más de ocho de cada diez cesáreas se realizaban con anestesia espinal. Las razones principales para el cambio exitoso de práctica consistieron en que se llevo a cabo bajo la dirección de un consultante, hubo buena comunicación entre los departamentos pertinentes, el personal subalterno estaba debidamente entrenado, hubo

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un suministro consistente de los medicamentos apropiados, y finalmente un alto nivel de satisfacción de los pacientes.

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INTRODUCTION

Worldwide, there has been a trend toward the increased use of regional anaesthesia (RA) for Caesarean section (1–7). The main anaesthetic factors contributing to maternal mortality have been difficulties with intubation and aspiration pneumonitis (8), associated with general anaesthesia (GA). The increased use of regional anaesthesia may therefore be a major factor in the observed reduction in maternal mortality related to anaesthesia (9). Lack of involvement of senior staff was also a recurring theme (10). The decreased mortality occurred despite an increasing Caesarean section rate (10, 11). However, other contributions to the reports of decreased maternal mortality could be from concurrent improvement in the care and facilities offered to obstetric patients.

Regional anaesthesia has also been shown to be associated with a decreased incidence in post-Caesarean section morbidity (12), and with better Apgar scores in neonates (13, 14).

In view of the change in obstetric anaesthesia practices worldwide and the perceived benefits from the use of RA, in 1997 a Spinal Anaesthesia Project on the Labour Ward at the University Hospital of the West Indies (UHWI) was started with the aim of having at least 60% of the elective Caesarean sections performed under spinal anaesthesia (SA).

This study is a retrospective review of obstetric anaesthetic practice at the UHWI between January 1996 and December 2001.

METHODS

Implementing the spinal anaesthesia project

The project was initially discussed at formal meetings between medical staff of the Section of Anaesthesia, medical and nursing staff of the Department of Obstetrics and Gynaecology and a representative from the Pharmacy Department. Once the details of the project were agreed, the senior staff and then the junior staff in all affected departments were informed and their cooperation and support requested. Meetings were held to allow reservations to be addressed and clarification given where necessary.

Consistent consultant coverage for the Labour Ward was instituted, ensuring that all junior anaesthetic staff were trained in the technique for spinal anaesthesia and the management of common problems that can occur with this technique in obstetric patients.

The deliveries and anaesthetic books from the UHWI Labour Ward for the period January 1996 and December 2001 were reviewed, recording the number of deliveries and the number of Caesarean sections per month. For each Caesarean section, the type of anaesthesia (SA or GA), and the classification of each Caesarean section (elective or emergency) was recorded.

The number of operative deliveries per month by anaesthetic type and Caesarean section classification were plotted. For each plot, a three month running mean by averaging the number of deliveries over every consecutive three-month period was used, so that the number of deliveries in February 1996 was the mean of deliveries in January, February and March 1996. March 1996 used February, March, and April, and so on. This smoothing procedure allowed us to see trends above random monthly fluctuation.

RESULTS

On average, there were 2776 deliveries per year for the six years reviewed. The number of deliveries reached a peak of 3071 in 1997, before falling to a low of 2316 in 2001 (Table). There were 3983 Caesarean sections performed in the study period; data were unavailable for 34, making a missing data rate of less than one per cent. Those with unavailable data were excluded from any analysis. The number and percentage of Caesarean deliveries increased from 542 (18%) in 1996 to 799 (32%) in 2000, before falling to 674 (29%) in 2001 (Table). Of the operative deliveries, 2316 were done under SA and 1510 done using GA. A further 137 required conversion from SA to GA. The 'Other' group (n = 20)

Table: Number of deliveries and percentage of Caesarean sections, by year

Year	Total deliveries (TD)	Elective Caesarean section	Emergency Caesarean section	Total Caesarean section (% of TD)	SA	GA	Conversion	Other
1996	2936	161	381	542 (18)	30	502	8	2
1997	3071	191	390	581 (19)	184	370	21	6
1998	2997	210	457	667 (22)	353	293	20	1
1999	2839	203	517	720 (25)	552	141	24	3
2000	2502	328	471	799 (32)	635	120	39	5
2001	2316	278	396	674 (29)	562	84	25	3
All years	**16661**	**1371**	**2612**	**3983 (24)**	**2316**	**1510**	**137**	**20**

included the few epidurals and GA to SA conversions (Table).

In 1996, more than 90% of all Caesarean sections monthly were performed under GA (mean 94.2%) (Fig. 1).

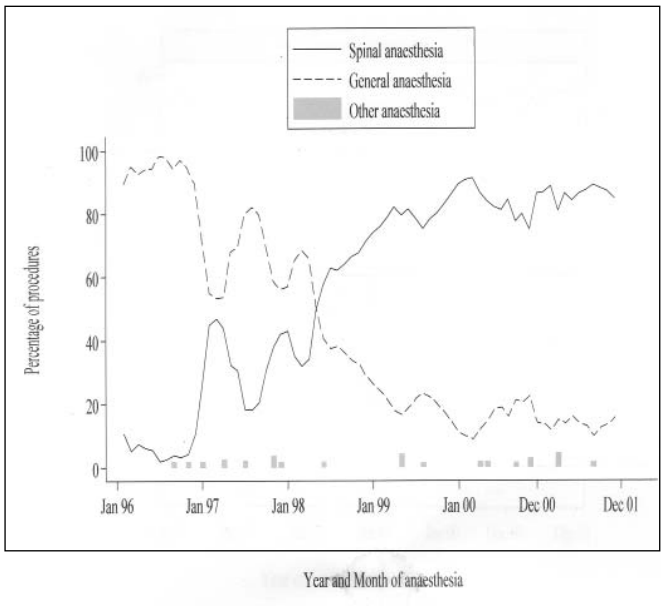

Fig. 1: Percentage of general and spinal anaesthetic procedures for operative deliveries at the University Hospital of the West Indies between January 1996 and December 2001.

During 1997 there was a decline in this number coinciding with an increase in the use of SA. By the middle of 1998, SA became and remained the more common method of anaesthesia.

Emergency Caesarean sections comprised the majority of the operative deliveries throughout the study period (2612 *vs* 1371 elective cases). There was an increase in elective Caesarean sections from 161 in 1996 to a high of 328 in 2000, declining to 278 in 2001 (Table).

The pattern of anaesthetic techniques used for both emergency and elective Caesarean sections was the same as that seen in the combined plot; from 1997 onwards, there was a steady decline in the use of GA coincident with an increased use of SA. Spinal anaesthesia reached 60% of all elective procedures between February and April 1997. Levels subsequently fell, before rising and remaining above 60% from July 1998, with annual averages of 85% in 1999, and 89% in 2000 and 2001 (Fig. 2). For emergency procedures, SA reached and remained above 60% from October 1998, with annual averages of 77% in 1999, 80% in 2000 and 84% in 2001 (Fig. 2).

DISCUSSION

In 1996, many countries had increased the use of RA for operative deliveries (3, 6, 15). At the UHWI, over 90% were still being done under GA. There were several reasons for this. Spinal anaesthesia was rarely performed and as the technique was not routinely taught to the junior anaesthetic staff, it was generally time consuming. Additionally, lignocaine 5% was the only drug available for SA and had been associated with reports of radicular irritation (16). Because of its relatively short duration of action, its use was precluded if the operation was likely to last longer than 45–60 minutes. These factors contributed to an initial reluctance from the labour ward staff (medical and nursing) to promote SA. Patients were also reluctant, as they were not sensitized to the availability and advantages of this type of anaesthesia during antenatal care.

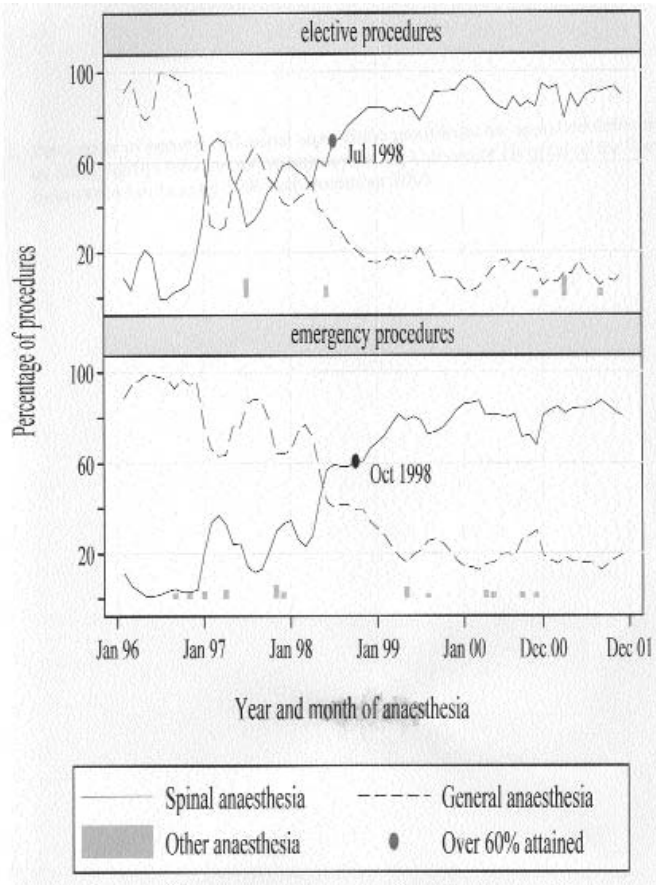

Fig. 2: Percentage of general and spinal anaesthetic procedures for operative deliveries by classification (elective or emergency) at the University Hospital of the West Indies between January 1996 and December 2001.

At the outset, a target of 60% of all elective operative deliveries was selected as a reasonable compromise between the suggestion of 80% use of RA as best clinical practice (17) and the UHWI reality of < 10% use of RA. The elective cases were chosen as they offered adequate time to prepare patient and staff, with less pressure on the anaesthetic junior staff as they mastered the technique.

The result was a dramatic change of practice in the provision of anaesthesia for Caesarean sections at the UHWI.

The decision to increase the use of SA was made in January 1997 and by July 1998 (just 19 months later) the target was achieved. By October 1998, 22 months after the beginning of the project, 60% of the emergency Caesarean sections were also being done under SA. In both classes of Caesarean sections it represented a sustained change of practice.

These figures compare favourably with results from other countries. The University of Basel in Switzerland also attained a marked shift in their obstetric anaesthetic practice but over a 12-year period (18). In the United States of America, the use of RA increased from 51% to 84%, between 1981 and 1992, a period of 11 years (3). In Germany, in 1978, 94% of all operative deliveries were being done under GA, which decreased to 60% for elective cases in 1996 (19). However, 80% of urgent cases and 94% of emergency cases were still being done under GA. At the UHWI, although the data highlight a greater change in practice for both elective and emergency cases, no distinction was made between urgent cases (those cases in which the risk to mother or fetus was not immediately life-threatening) and emergency cases (those in which there was an immediate threat to life of mother or foetus) (20). Urgent cases afford more time in order to prepare for and perform the regional technique and had these cases been treated separately the percentage for emergency cases using RA might have been lower.

Achieving a change of practice in health professionals or patients can be difficult and time-consuming. The Labour Ward staff were concerned that a spinal procedure would take longer to perform than a GA, leading to delays and adding to the strain of an already heavy workload. Patients were worried about the needle-stick, experiencing pain during the institution of SA and during the surgical procedure and post-anaesthesia sequelae (*eg* paralysis).

To encourage the required changes in acceptance and practice, staff were intrinsically involved in the change process, with opportunities for education and feedback (21). Experienced and respected clinicians may be better for effecting change of practice (22, 23). Our project was led by an anaesthetic consultant, who initiated communication between the various stakeholders. This identified an 'opinion leader' to disseminate information about the project to other staff (22). Key personnel were contacted and discussions held to ensure that everyone understood and accepted the primary goal of the project. Continuing two-way communication was crucial throughout the project, ensuring that difficulties were dealt with as they arose. This allowed potential problems to be solved without the development of any major events.

With communication channels identified, staff education was incorporated. There was evidence in the literature to suggest real advantages of RA over GA (9–14). The education programme was widely promoted in the Departments of Anaesthesia and Obstetrics through lecture discussions with medical and nursing staff at all levels. Additionally, all anaesthetic residents were trained and supervised until they were comfortable with the technique of SA, could achieve it in less than 15 minutes and could deal with the common problems that occurred in the obstetric patient under SA. This education removed many of the concerns related to time and workload.

The next major task was to ensure a steady supply of spinal bupivacaine and other drugs needed as adjuncts. The project pharmacist (the 'opinion leader' in the Pharmacy Department) convinced the hospital that the outlay costs would be offset by the advantages in the long term.

There was little difficulty in convincing the patients to have a spinal anaesthetic after the midwives became the 'opinion leaders' in the antenatal clinic. Sessions were also arranged for the consultant leading the change to talk to the mothers. The benefits of the procedure were stressed, mothers were reassured that GA was always an option and all their questions were answered fully. As the project started and the procedure became more popular, the women then became advocates for the use of SA and their satisfaction was a major part of achieving the change of practice.

This study neither compared SA and GA to detect which was better nor addressed the incidence of complications which has been reported as 0.1% (2) with few long term sequelae. Further studies will be needed to examine these issues.

A successful and rapid change of anaesthetic practice for Caesarean sections occurred at the UHWI over the period 1996-2001, with SA becoming and remaining the dominant technique over GA. The project was a physician-led implementation with support from senior staff members in all relevant departments, good communication and a high level of patient satisfaction.

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