

Puerperal sterilisation: comparison of the use of local anaesthesia and epidural lumbar anaesthesia

By

DR. WONG WAI PENG M.B.B.S. (S'pore), F.R.C.S.(E), M.R.C.O.G.
PROF. NG KENG HING M.B.B.S. (S'pore), F.R.C.S. (E), M.R.C.O.G.
PROF. I.S. FUVAN M.B.B.S., F.R.C.S.(E), M.R.C.O.G., M.R.C.P.
Department of Obstetrics and Gynaecology,
University of Malaya, Kuala Lumpur, Malaysia.

In Malaysia, puerperal tubal ligations are performed under various forms of anaesthesia. The most commonly used method is local anaesthesia, Spinal anaesthesia and general anaesthesia are not often used because of lack of trained anaesthetists or doctors with anaesthetic experience. In a previous

communication (Ng, K.H. and Wong, W.P., 1974), we assessed the safety, effectiveness and side-effects of lumbar epidural anaesthesia and its application to obstetric practice in Malaysia. This paper presents a comparison of the use of local anaesthesia and lumbar epidural block for post-partum sterilisation.

Presented at the 8th Malaysian Singapore Congress of Medicine September 7th-8th, 1974.

MATERIALS AND METHODS

There were in all 400 women who had puerperal sterilisation in this study. 200 of them had local anaesthesia and 200 had lumbar epidural block. All these patients had no contraindications for postpartum ligation. The type of anaesthesia used for each patient was randomly selected. All operations were performed in the University Hospital, Kuala Lumpur. The local anaesthesia was given by house officers, medical officers and lecturers who performed the operation. Epidural anaesthesia were administered by one of us and the operations were performed by house-officers and medical officers.

The premedication was standardised for all patients and consisted of 100 mgm. of pethidine and 50 mgm. of promethazine half to one hour

before the operation. The anaesthesia was standardised, usually 15-20 ml. of 1 percent lignocaine was used for local infiltration. It was given beneath the skin, alongside and in the site of incision. The method of giving a lumbar epidural block has been described previously (Ng, K.H. and Wong, W.P., 1974). Basically, a 16 gauge Touhy needle was used generally between second and third lumbar vertebrae. Loss of resistance was used as a method of testing entry into the epidural space. Low dosages of 0.5 percent marcain with adrenaline 1 in 200,000 was used. Before the block was undertaken, preliminary safety measures were undertaken. A control blood pressure reading was taken; an open vein was secured; a suitable vasopressor, and a supply of oxygen with means of easy administration were made readily available. The operative procedure was initiated 10 minutes after the anaesthetic has been given.

RESULTS

The patients in the two groups were comparable in respect of race, parity, age and social class.

The patients who had local anaesthesia consisted of 86 Chinese, 93 Indians and 21 Malays. Sixty-five percent of the patients were grade-multipara with seventy percent in social class four and five. The average age was 29 years with a standard deviation of 5 years.

The patients who had lumbar epidural anaesthesia consisted of 88 Chinese, 86 Indians, 20 Malays and 6 other races. Sixty-three percent of the patients were grandmultipara with seventy-one percent in social class four and five. The average age was 28.4 years with a standard deviation of 5 years.

ANAESTHESIA ACHIEVED (TABLE 1)

The local anaesthetic agent was given to a small area on the skin and therefore the corresponding area of anaesthesia was necessarily small. The lumbar epidural block achieved a much greater area of anaesthesia, generally dermatome levels between T₇ and L₂. This large area of analgesia achieved was very important because occasionally the surgical incisions needed to be enlarged or another incision was necessary because of difficulty encountered during the operation or because of troublesome bleeding.

In all, there were 5 failures with the lumbar epidural block, an incidence of 2.5 percent. In one of these patients, the anaesthesia achieved was patchy.

TABLE I

DERMATOME LEVELS ACHIEVED WITH LUMBAR EPIDURAL BLOCK

| UPPERMOST | DERMATOMES | LOWERMOST | DERMATOMES |
|-----------------|------------|-----------------|------------|
| T ₁₁ | 3 | T ₁₂ | 8 |
| T ₁₀ | 11 | L ₁ | 45 |
| T ₉ | 34 | L ₂ | 138 |
| T ₈ | 88 | L ₃ | 4 |
| T ₇ | 31 | | |
| T ₆ | 22 | | |
| T ₅ | 4 | | |
| T ₄ | 2 | | |
| FAILURES | 5 | FAILURES | 5 |

SURGEONS' ASSESSMENT OF EFFECTIVENESS OF ANAESTHESIA (TABLE 2)

Effectiveness of anaesthesia during operation was assessed by the surgeons who performed the operations. The results showed that there was a significant difference; lumbar epidural anaesthesia being superior to that produced by local anaesthesia ($p < 0.01$). Out of the 191 patients who had a successful lumbar epidural block and was assessed by the surgeons, 173 patients were considered to be well relaxed and anaesthetized for puerperal

tubal ligation. In contrast, out of 154 patients who had local anaesthesia and who were assessed, only 45 patients were considered to be well relaxed and painfree.

This was reflected in the shorter operating time for patients who had lumbar epidural block which was significantly different in the two groups, (Table 3). The mean operating times with standard deviation were 39.6 mins \pm 4.1 mins and 29.4 mins \pm 5.8 mins respectively for patients who had local anaesthesia and patients who had lumbar epidural

block. When patients experience pain during the operation, they had a tendency to hyperventilate with consequent displacement of intestines into the operative field rendering it much more difficult to complete the operation.

Also, there was a tendency to use a more diffi-

cult but cosmetically better incision because of the good relaxation of the patients. The semi-lunar sub-umbilical incisions were used in only 13 patients who had local anaesthesia whereas 35 patients with lumbar epidural block had the same incisions.

TABLE II
EFFECTIVENESS OF ANAESTHESIA AS ASSESSED BY SURGEONS

| SURGICAL ASSESSMENT | LOCAL ANAESTHESIA | | LUMBAR EPIDURAL BLOCK | |
|---------------------|-------------------|----|-----------------------|-----|
| | | | | |
| GOOD | * | 45 | | 173 |
| FAIR | + | 89 | | 18 |
| POOR | o | 20 | | 5 x |
| NOT KNOWN | | 46 | | 4 |

* $p < 0.01$
+ $p < 0.01$
o $p < 0.01$

x FAILURES

TABLE III
INCISIONS USED AND TIME TAKEN TO DO TUBAL LIGATIONS

| | LOCAL ANAESTHESIA | LUMBAR EPIDURAL BLOCK |
|--------------------------|--------------------|-----------------------|
| Type of incisions | | |
| Sub-Umbilical Midline | 183 | 160 |
| Sub-Umbilical Semi-lunar | 13 | 35 |
| Time Taken (in minutes) | * 39.6 S.D. 4.1 | 29.4 S.D. 3.8 |

* $p < 0.01$

PATIENTS' ASSESSMENT OF ANAESTHESIA (TABLE 4)

We attempted to assess the effectiveness of the two types of anaesthesia with special regard to absence of pain at operation. Of the 200 patients

who had local anaesthesia, 10 complained of severe discomfort, 144 experienced mild to moderate discomfort while no pain was experienced by 37 patients. This was significantly different when compared with patients who had successful lumbar

epidural block where only 4 patients suffered severe discomfort, 55 experienced mild to moderate pain and 136 patients, had no discomfort whatsoever. The pain experienced with local anaesthesia consisted mainly of discomfort on incising the peritoneum, of attempts to locate and/or deliver the fallopian tubes and during suturing of the peritoneum. In 3 of the patients who complained of pain with the lumbar epidural block, the discomfort was experienced when the peritoneum was pulled on when suturing was necessary at the end of the operations. What was very important when experience of discomfort was encountered was that more patients who had local anaesthesia for puerperal sterilisation were prepared to advise others against a similar

procedure, (Table 5). There was significant difference between these and the responses of patients who had lumbar epidural block ($p < 0.01$). Out of 195 patients who had successful epidural block, only 10 would advise against a similar procedure under a similar anaesthesia. These responses seem to be very significant in the context of encouraging patients to have puerperal sterilisation as a method of contraception. We have seen patients who experienced discomfort during the sterilisation procedure complain bitterly to their neighbours. And if these occur as regularly as 20 per cent of patients who had puerperal sterilisation under local anaesthesia, one can envisage the disastrous effect on a local post-partum sterilisation programme.

TABLE IV
ANAESTHESIA FROM PAIN AS ASSESSED BY PATIENTS

| PAIN ASSESSMENT | LOCAL ANAESTHESIA | LUMBAR EPIDURAL BLOCK |
|--------------------|-------------------|-----------------------|
| SEVERE | * 19 | 4 + 5 * |
| SLIGHT TO MODERATE | + 144 | 55 |
| NIL | o 37 | 136 |
| | 200 | 200 |

* $p < 0.05 > 0.02$

+ $p < 0.01$

o $p < 0.01$

* FAILURES

TABLE V
RECEPTION TO TYPE OF ANAESTHESIA

| | LOCAL ANAESTHESIA | LUMBAR EPIDURAL BLOCK |
|----------------|-------------------|-----------------------|
| Advise For | 158 | 185 |
| Advise against | 4 2 | 10 + 5 † |

$p < 0.01$

† 5 -- failures

SIDE EFFECTS

One of the characteristics of good anaesthesia is absence of side-effects. One of the commonest side effects with lumbar epidural anaesthesia is its effects on the blood pressure, (Table 6). In this study of lumbar epidural block, minimal drops in blood pressure were seen in 106 patients while moderate hypotension, namely fall of 20 mmHg systolic and 15 mmHg diastolic, were seen in 31 patients. 4 patients had marked hypotension; the blood pressures falling by more than 20 mmHg or below the level of 90/60 mmHg. In the 4 patients who had marked fall in blood pressures, it was found that relatively large amounts of anaesthetic (0.5 percent marcain and adrenaline 1/200,000) of more than 10 ml. were used. These patients improved with positioning and administration of intravenous saline (Ng, K.H. and Wong, W.P., 1974). It was also found that minimal and moderate falls in blood pressure were seen in patients who had local anaesthesia. It was very likely due to the type of sedation that was given. However, there was significant difference in the incidence of hypotension. Marked blood pressure depreciations seemed to be

commoner in those patients with labile blood pressures, namely, patients who had toxæmia during pregnancy and this was seen in 10 of the patients who had local anaesthesia and 8 of the patients who had lumbar epidural block.

There were also a number of side-effects of lumbar epidural block, (Table 7). There were two accidental spinal punctures. After removing the needles from the sub-arachnoid spaces, lumbar epidural anaesthesia were successfully performed. There was no incidence of an accidental massive spinal through an inadvertent spinal puncture. One patient had difficulty in walking after lumbar epidural block but she recovered after 2 days. There was hypoalgesia and hypoesthesia on the external surface of the leg and was probably consequent to direct damage to the 3rd lumbar root. These incidences of complications of epidural block are not higher than many other series, (Dawkins, C.J.M., 1971). 6 patients who had local anaesthesia had mild skin infection with wound breakdown. The possibility is that the multiple needle injections of local anaesthetic may serve to introduce infection into the operative fields.

TABLE VI

COMPLICATION OF ANAESTHESIA: BLOOD PRESSURE

| EFFECT OF BLOOD PRESSURE | LOCAL ANAESTHESIA | LUMBAR EPIDURAL BLOCK |
|--|-------------------|-----------------------|
| 1. No effect or slight rise | 116 | 54 |
| 2. Minimal Drop | 64 | 106 |
| 3. DROP of 20 mmHg Systolic and/or 15 mmHg DIASTOLIC | 20 | 31 |
| 4. SEVERE (20 mmHg or 90/60 mmHg or less) | | 4 |
| | 200 | 195 |

TABLE VII
OTHER COMPLICATIONS

| LOCAL ANAESTHESIA | LUMBAR EPIDURAL BLOCK |
|------------------------------------|--|
| 1. Skin Breakdown with infection 6 | 1. Backache 2 |
| | 2. Rash over site of epidural with pruritis 2 |
| | 3. Accidental dural puncture (completed epidural afterwards) 2 |
| | 4. Bleeding |
| | 5. Difficulty in walking (2 days) 1 |
| | 6. Failed Block 5 |

DISCUSSION

It can be seen that lumbar epidural block compared favourably with local anaesthesia as a suitable anaesthesia for puerperal tubal ligation. This form of anaesthesia produced excellent analgesia and relaxation, was well accepted by patients and was associated with low incidence of side-effects. Though local anaesthesia is commonly practised, it can be seen in this comparative study that its greatest disadvantage lies in the high rates of patients' discomfort and subsequent rejections of the whole operative procedure of tubal ligations. One of the ways of avoiding discomfort with delivery of the fallopian tube can be the use of 1% lidocaine tubal spray (Kumarasamy, T. et al, 1974). Lumbar epidural anaesthesia do have their side-effects, chiefly, hypotension but this can be circumvented by using low dosages of the anaesthetic agents. We recommend that lumbar anaesthesia to be more widely practised in Malaysia as an

excellent anaesthesia for puerperal tubal ligation.

ACKNOWLEDGEMENTS

Thanks to Professor T.A. Sinnathuray for encouragement and permission to publish this paper and Miss Magasvari for secretarial help.

REFERENCES

1. Dawkins, C.J.M. (1971): Proceed. Symp. Epidural Analgesia in Obstetrics p 67 - 72.
2. Kumarasamy T., Brenner W.E., Hulka, J.F., Fishburne, J.L., Mercer J.P., Omran, K.F., Dingfelder, J.R., Staurovsky, L.G., Grimes, D.A. and Hernicks, C.H. (1974). Proceed. seminar on Voluntary Sterilisation and Post-contraceptive regulation p. 79 - 85.
3. Ng, K.H. and Wong, W.P. (1974): Asian Med. Journal Vol 10 p 43 - 44.