EXPERIENCE WITH SPINAL ANALGESIA IN A BRITISH OBSTETRIC UNIT

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SUMMARY

A series of 443 spinal anaesthetics is described. The procedures included operative vaginal delivery, removal of retained placenta and a miscellaneous group common to most obstetric units. Failure to provide effective relief of pain occurred in 5.2% of patients. There was one potentially serious complication, but with this exception hypotension was not a feature. Headache following spinal analgesia was experienced by 16.3% of patients, the frequency being greater among those who received spinal analgesia at or shortly after delivery, but was unrelated to the size of the needle (23-gauge or 25-gauge) used. Extradural blood patch promptly and permanently cured the headache. The duration of sensory and motor loss after operation varied considerably with the local anaesthetic agent used. The re-introduction of spinal analgesia into British obstetric anaesthetic practice is advocated.

Spinal block analgesia has suffered what many now consider to have been an unwarranted opprobrium in the United Kingdom during the past 30 yr. This has been so despite the fact that in North America, where the standards of anaesthetic care and the reporting of misadventures are at least the equal of ours, the method has been extensively used throughout that period. There are many advantages to the use of spinal analgesia, and it is disappointing that the majority of anaesthetists in training during the past 2–3 decades have received little or no guidance on the administration of a spinal block, because of the prejudice or, more commonly, the inexperience of their consultants.

The increasing interest in the application of regional analgesia in obstetric anaesthetic practice gives promise that experience gained in this subdivision of anaesthetic practice will herald the spread of the popularity of spinal analgesia to other provinces of anaesthesia. Our own experience with the technique, whilst infinitesimal in comparison with that of centres in the United States and Canada, is now considerable. We report it in the hope that others will be encouraged thereby to employ it more frequently.

MATERIALS AND METHOD

The technique of administration was standard and has been described in detail elsewhere (Crawford, 1978). Three drugs have been used. Initially we injected cinchocaine (2.5 mg of the drug in 1.0 ml of 5% dextrose), but when this became unavailable for some time as a result of manufacturing difficulties, we elected to use 5.0% lignocaine in 7.5% dextrose, a solution produced as a routine for many years, by the Department of Pharmacy in the Queen Elizabeth Medical Centre. Heavy Citanest (5% prilocaine in 6% dextrose), which appeared on the market rather briefly some time ago, has been used also. The volume administered was approximately 1.25–1.50 ml irrespective of the identity of the agent. We have relied upon manipulation of maternal posture to induce the required extent of sensory blockade. When a sacral block only was required (as for re-suture of the perineal wound) the patient remained in the erect sitting position for at least 15 s after completion of the injection. If a sensory block extending to T10 was needed (as for a mid-cavity forceps delivery, or removal of a retained placenta), the mother was returned promptly to the supine tilted position (on a wedge) after having sat erect for 5 s following completion of the injection.

Two sizes of spinal needle have been used. Originally we used a 23-gauge non-disposable needle without an introducer. More recently, in the expectation of reducing the frequency of post-spinal headache, we have used a 25-gauge disposable needle (Steriseal) with the aid of a 3.5-in. (8.75-cm) 20-gauge introducer advanced into the ligamentum flavum. Little or no attempt has been made to regulate the direction of the level of the needle in relationship to maternal tissues. The solution was injected at a
steady rate throughout a period of approximately 10 s.

Selection of patients
In the context of a very intensive "extradural service" the number of prospective candidates has been small. The indications for spinal analgesia have been:

delivery by forceps, or breech, or of a multiple pregnancy, of a patient who had not received an extradural block;
removal of a retained placenta in a patient who had no extradural block;
evacuation of retained products of conception (excluding patients admitted for termination of pregnancy, who are likely to have an extradural block); in this category we have tended not to include patients who have recently aborted spontaneously, as they are understandably upset and would, we believe, prefer to be asleep during the operation;
primary repair of an extensive perineal tear, or re-suture of an episiotomy;
insertion of a Shirodkar suture (as an alternative to an extradural block);
miscellaneous surgical procedures on the perineum or cervix.

The assessment of the success or otherwise of the procedure has been based upon the evaluation reported by the patient during the routine interview on the following day. At the same time the patient was asked to estimate, to the nearest hour, the duration of sensory and motor loss. Direct enquiry was made as to whether or not the patient had a headache, and this enquiry was repeated daily on each of the following 5 days, or for as long as the patient remained in hospital.

RESULTS
Spinal analgesia was given for the vaginal delivery of 233 patients (nine breech, two multiple pregnancy, one spontaneous delivery and the remainder forceps). A 23-gauge needle was used in 160 of these patients. Manual removal of a retained placenta was conducted specifically under spinal analgesia in 65 patients; a 23-gauge needle was used in 40 of these. The number of "miscellaneous" patients totalled 145 (a 23-gauge needle was used in 91 of these), predominantly re-suture of perineum and evacuation of retained products of conception, but four patients who had a Shirodkar suture inserted and one who underwent haemorrhoidectomy post-natally were included.

Out of the total of 443 patients there was failure to initiate analgesia on five occasions (1.1%)—once in the vaginal delivery series and twice each in the other two groups. As a result, a general anaesthetic was given to each of these patients. The spinal block failed to provide complete relief in a further 18 patients (4.1%); seven patients undergoing forceps delivery, none of whom received a general anaesthetic; six patients undergoing removal of retained placenta, of whom five were consequently given a general anaesthetic; and five other patients, of whom three received a general anaesthetic.

The reported duration of motor and sensory block varied markedly with the local anaesthetic used, but not with the character of the obstetric or surgical procedure performed. The mean duration of sensory block among patients from whom an estimate was obtained was: cinchocaine (68 patients) 8.8 h, prilocaine (21 patients) 5.1 h, lignocaine (271 patients) 2.9 h. Respective mean duration of motor loss were: cinchocaine 7.0 h, prilocaine 4.5 h, lignocaine 2.8 h.

There was one major complication. A patient’s membranes ruptured spontaneously at 23 weeks’ gestation. She was kept in hospital and given uterine depressants, but 3 weeks later the umbilical cord prolapsed through a cervix which was only partially dilated. Spinal analgesia was administered as a matter of urgency as she was in pain and it was thought that she would be delivered rapidly. Inadvertently, a rather larger dose of lignocaine (2 ml) was injected, and because of maternal distress and some degree of unco-operation, it is doubtful that she sat upright for more than 2-3 s after completion of the injection. The block extended cephalad at a moderate pace and the patient began to complain of difficulty in breathing some 15 min after the injection. An endotracheal tube was passed with ease, as a precautionary measure. Peak spread of the sensory block (to T2) was reached 20 min after the injection. At no time was it necessary to assist ventilation. The endotracheal tube was removed about 30 min after intubation. The arterial pressure had decreased from a pre-spinal value of 115/70 mm Hg to 65/30 mm Hg by the time respiratory embarrassment became a feature. The hypotension was promptly and effectively reversed by the i.v. injection of ephedrine 10 mg accompanied and followed by the rapid infusion of 1.5 litre lactated Ringer’s solution. The block had been administered at 20.00 h and by midnight the sensory block had
worn off and the labour became painful. A lumbar extradural block was therefore provided at 00.10 h and the patient delivered at 04.50 h. The only noteworthy sequel was a post-spinal headache which was relieved by an extradural blood patch.

Apart from this event, headache was the only noteworthy complication associated with the spinal technique. The frequency of headache following spinal analgesia (table I) appeared to have been influenced little by the choice of spinal needle, and was least among those patients whose pregnancy had ended (as either an abortion or a term-delivery) some days before the procedure.

The provision of an extradural blood patch was introduced into our unit some considerable time after the start of the series under review. It is our current practice to offer a blood patch to those of our patients who experience a headache after spinal analgesia, and 29 of these patients accepted the offer, received the patch and were immediately relieved of the headache without further complication.

A significant decrease in arterial pressure did not occur in any patient other than the one described in detail above.

One further observation is worthy of report. A patient, having aborted spontaneously, received a spinal block for the evacuation of the retained products of conception. In a previous pregnancy she had been delivered by Caesarean section. The only discomfort felt by the patient during the uterine evacuation was pain at the site of the Caesarean section scar; possibly an instance of a "spinal sieve" analogous to the "epidural sieve" (Crawford, 1976).

DISCUSSION

The total success rate of this procedure in our hands has been reasonably high (94.8%). There have been two main causes of failure. Failure to initiate spinal analgesia was a result, in possibly three of the five occasions recorded, of misunderstanding. It is not always possible to aspirate cerebrospinal fluid through a very narrow-gauge spinal needle which has penetrated the dura, and successful entry might not be appreciated, leading to abandonment of the procedure. Subsequent development of a typical post-spinal headache serves to demonstrate the fallacy. Insufficient analgesia results usually from the failure to achieve a block which extends to T10 in patients who require a low or mid-cavity forceps delivery or the manual removal of a retained placenta. The frequency of this category of failure has diminished year by year in our hospital.

The duration of sensory and motor block after operation varied in the expected manner with the identity of the local anaesthetic. In the context of obstetric practice, as conducted in this country, there seems little justification for not choosing to use lignocaine. Chloroprocaine might offer a better alternative were it to become available in the appropriate formulation. We appreciate that the lignocaine solution provided for us by our Pharmacy Department has not met with official approval by the national bodies concerned with pharmaceuticals, and that clinicians will, for the time being at least, have to continue to rely upon their local pharmacists for supplies.

The frequency of post-spinal headache in this series is disappointingly high. There is no doubt that the headaches did occur and were of the classic postural type. They commenced on the first, occasionally the second, day after operation, and among those patients who did not receive an extradural blood patch the headache invariably persisted for 5-6 days. After some experience we could, with confidence, promise the affected patient that the headache would clear on the 6th day, and the promise was never broken. The frequency is greatly in excess of that which is quoted authoritatively. Phillips and colleagues (1969), using predominantly a 25- or 26-gauge needle in their series of 10 440 patients, found a frequency of 3.5% post-spinal headache, a figure which accords well with most of those quoted by Bonica (1967) in his review of the relevant literature. There are two factors which might have contributed to the high frequency which we have encountered. Possibly the pregnant patient differs, as in so many other particulars, from the non-pregnant in the propensity with which a headache results from dural puncture (Bonica, 1967). It might be of some significance in this regard that 17.8% of the 298 "peri-delivery patients" (vaginal delivery or retained placenta) experienced a spinal headache whereas, of
the 145 patients whose spinal analgesia was administered in the context of obstetric care but usually some time after pregnancy had ended, the frequency was 13.1%. The second factor is that we made no effort to ensure that our patients remained bed-fast (still less that they remained horizontal) for any appreciable length of time after the procedure. To have done so would have been to run counter to our hospital policy of encouraging close maternal–infant relationship at the earliest reasonable time after delivery.

The introduction of the technique of extradural blood patch, and our increasing confidence in the safety, as well as in the effectiveness of this therapy, has reduced our anxiety about the prospect of headache.

The one potentially serious complication encountered in this series served mainly to demonstrate that, even in the event that a high spinal block is produced inadvertently, the rate of deterioration in the patient's condition is such that it is inconceivable that any serious harm should result if a competent medical attendant, and the appropriate elementary implements of resuscitation, are available immediately. If either of these conditions cannot be met, that is, if there can be no guarantee of a doctor competent and equipped to perform endotracheal intubation and to apply intermittent positive pressure ventilation with an adequacy of oxygen through an endotracheal tube, then the use of spinal analgesia should be avoided except as a life-saving measure for mother or infant.

Hypovolaemia should be considered a contraindication to spinal analgesia. In the rare circumstance that considerable haemorrhage has occurred the complete or partial retention of a placenta, or that blood loss from a vulvo-vaginal wound has been excessive, appropriate replenishment of circulating blood volume should be completed before initiation of spinal analgesia. If haemorrhage of such proportion occurs during the course of the obstetric procedure, subsequent to the establishment of the spinal analgesia, management is no different from that which would be applicable were the patient to have received extradural analgesia.

CONCLUSIONS

We believe that our experience justifies our plea that spinal analgesia be re-introduced on a considerable scale to British obstetric anaesthetic practice. We do not advocate its general use for Caesarean section, for reasons detailed elsewhere (Crawford, 1978) but, for the categories of procedure referred to in this report, we believe it to offer outstanding advantages. In obstetric units which encompass an "extradural service" the place of spinal analgesia will be limited, but as is evident from this account, even in our own hospital, in which 70% of patients in labour receive an extradural block, spinal analgesia is provided quite frequently. In obstetric units which cannot offer a liberal extradural service, the facility to provide spinal analgesia for operative vaginal delivery, the removal of retained placenta, postpartum exploration of the uterus, post-partum perineal surgery, insertion of Shirodkar suture, and the like, must surely be accepted as being outstandingly preferable to reliance upon general anaesthesia (with its attendant dangers, unpleasantness and elimination of prompt maternal–infant rapport) or upon the relative ineffectiveness of pudendal block. The immediate complications of spinal analgesia used in the manner described, in a well-ordered and informed obstetric unit, will be of a very low order indeed provided that the simple guidelines respecting hypovolaemia and the availability of skilled aid are adhered to. The author's personal view is that there is no objection to spinal analgesia being administered, in the manner described, by obstetricians, provided that the latter have been trained under anaesthetic supervision and are able to provide elementary resuscitation, and that there is assurance that anaesthetic aid will be forthcoming promptly if required.

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REFERENCES


EXPERIENCE AVEC L'ANALGESIE RACHIDIENNE DANS UNE CLINIQUE BRITANNIQUE D'OBSTETRIQUE

RESUME

On décrit dans cet article une série de 443 anesthésies rachidiennes. Parmi les interventions effectuées, il y a eu des accouchements opératoires par le vagin, des extractions de
placenta non evacué, et un groupe de divers commun à la plupart des cliniques d'obstétrique. On a constaté un échec dans le soulagement efficace de la douleur dans 5,2% des cas. Il y a eu une complication qui aurait pu être grave, mais à cette exception près, l'hypotension n'a pas été caractéristique. Des maux de tête après l'administration d'un analgésique rachidien ont été constatés dans 16,3% des cas, la fréquence étant plus grande parmi les femmes qui avaient reçu un analgésique rachidien au moment de l'accouchement ou juste après, ceci n'ayant toutefois aucune relation avec la dimension de l'aiguille utilisée (calibre 23 ou 25). L'obturation extradurale a éliminé rapidement et d'une manière permanente ces maux de tête. La durée de la perte de la faculté sensorielle et motrice après l'opération a varié d'une manière considérable suivant l'agent anesthésiant utilisé. On recommande dans cet article la réintroduction de l'analgesie rachidienne dans la pratique d'anesthésie britannique en matière d'obstétrique.

ERFAHRUNGEN MIT RÜCKENMARKS-ANALGESIE IN EINER BRITISCHEN GEBURTENKLINIK

ZUSAMMENFASSUNG


EXPERIMENTOS MEDIANTE ANALGESIA ESPINAL EN UNA UNIDAD OBSTETRICA BRITANICA

SUMARIO

Se da una descripción de una serie de 443 anestesias espinales. Las intervenciones incluían parto vaginal quirúrgico, remoción de placenta retenida, y un grupo mixto común a la mayoría de las unidades obstétricas. En un 5,2% de los pacientes, no fue posible aliviar el dolor de manera eficaz. Hubo una complicación potencialmente grave, pero, con esta excepción, la hipotensión no constituía una característica. En un 16,3%, los pacientes sufrieron de dolor de cabeza postespal después de la analgesia espinal, siendo más frecuente este entre las personas que recibieron analgesia espinal en el momento del parto o poco después, pero esto no tenía relación alguna con el tamaño de la aguja (calibre 23 ó 25). La placa de sangre extradural curó el dolor de cabeza rápida y permanentemente. La pérdida sensorial y motora después de la operación varió considerablemente en función del agente anestésico local utilizado. Se recomienda la reintroducción de la analgesia espinal en la aplicación de anestesia en la obstetricia británica.