

fetal head at or below the level of the spines. In multigravidas tap is performed at 4 to 6 cm. dilatation with 40 to 50 per cent effacement.

Seventy-three per cent had complete pain relief. Ninety-two required no supplement for perineal repair, 27 per cent required supplement for delivery and 4.5 per cent were considered unsuccessful. The fetal mortality rate was 1.5 per cent. There were no maternal deaths. All but 18 cases were delivered by forceps. Post spinal headache occurred in 8 per cent and nausea and vomiting in 20 per cent.

Complications to the method were then discussed. If analgesia is above the tenth or eleventh dorsal segments, labor is prolonged. If the occiput is posterior, it seldom rotates anteriorly.

For cesarean section 7 to 10 mg. of pontocaine with 10 per cent dextrose were used in most cases. A few received 4 to 5 mg. of nupercaine with 1 cc. of 10 per cent dextrose. Total dilution was 3 to 3.5 cc. with spinal fluid. The tap was done in the lateral position. There was an immediate and marked drop in blood pressure, which usually became elevated in five to eight minutes. There was seldom need for supplemental vasopressors.

One hundred and thirty-six cases needed no supplement, while 4.6 per cent did in the form of pentothal or ethylene. There were 5 stillborns and 3 neonatal deaths.

One maternal death occurred on the third postoperative day. Diagnosis of massive pulmonary embolism was made. There were 5 cases of atelectasis. Post-spinal headaches were less frequent than following vaginal delivery.

#### SUMMARY AND CONCLUSIONS

1. Of 966 cases receiving spinal anesthesia, 73 per cent delivered by the vaginal route had complete pain relief.

2. Ninety-two per cent needed no supplement for perineal repair.

3. It was unsuccessful in 4.5 per cent of vaginal deliveries.

4. Over 96 per cent of cesarean sections needed no supplement.

5. There were no fetal or maternal deaths attributable to anesthesia.

6. Spinal anesthesia for vaginal delivery is best suited to those in whom contractions are hard and frequent, with relatively slow cervical dilatation and effacement. When used, it is of advantage to the baby and no more hazardous for the mother than other types of anesthesia. 12 references.

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CLARK, DAVID G.: *Anesthesia Activities Aboard U. S. S. "Benevolence."* U. S. Nav. M. Bull. 48: 190-197 (Mar.-Apr.) 1948.

A brief resume of the permanent equipment, personnel, and anesthesia problems is presented.

The entire ship is air conditioned which makes operating conditions pleasant and prevents accumulation of anesthetic gases. An anesthesia room is incorporated in the operating room suite.

One nurse anesthetist and 1 medical officer in charge of anesthesia were assigned aboard. Both carried on other routine duties connected with surgery so that the conduct of anesthesia was essentially secondary.

General anesthesia was administered for intra-abdominal surgery above the level of the umbilicus and for other procedures above this level, unless satisfactory local or regional anesthesia could be produced.

Nitrous oxide and oxygen in conjunction with pentothal was used whenever the operative time was to exceed twenty to thirty minutes, or, whenever the operation contemplated led the anesthetist to expect that more than 1.5 Gm. might be used. It was found that the administration of pen-

total sodium to the average adult male with the usual premedication of morphine sulfate grs.  $\frac{1}{2}$  and atrophine grs.  $\frac{1}{150}$  (h) came to 1.8 cc. per minute of operating time. In combination with nitrous oxide and oxygen, either 50-50 or 60-40, the amount of pentothal was reduced to 0.93 cc. per minute. Nitrous oxide plus oxygen plus pentothal was not attempted in intra-abdominal procedures or other operative procedures demanding relaxation.

Due to the fact that herniorrhaphies, appendectomies, excisions of pilonoidal cysts, and rectal cases constitute a large part of operative procedures in the fleet, spinal anesthesia assumes a correspondingly important position. Spinal anesthesia was confined to procedures carried out below the level of the umbilicus.

Any spinal anesthesia with novocain giving forty-five minutes or more of anesthesia adequate for the operation performed was called satisfactory. Seventy-two per cent of spinal administered was unsatisfactory on this basis.

Continuous spinal was performed only 5 times with no failures and no complications. 1 reference.

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ANDROS, G. J.; DIECKMANN, W. J.; OUDA, P.; PRIDDLE, H. D.; SMITTER, R. C., AND BRYAN, W. M.: *Spinal (Saddle Block) Anesthesia in Obstetrics*. Am. J. Obst. & Gynec. 55: 806-820 (May) 1948.

Anesthesia for delivery is a precise procedure and depends on the presence of one qualified to administer the anesthetic of choice. It is the purpose of this paper to determine the advantages and disadvantages of spinal (saddle block) anesthesia for the relief of pain in labor and for the delivery. It is the author's belief that with some training the average physician can administer spinal anesthesia for the relief of pain

of the late second stage and for the delivery, with a high degree of safety.

A study of 719 cases of modified saddle block anesthesia was carried out at the Chicago Lying-in Hospital.

Spinal anesthesia was done in the patient's bed, utilizing the third or fourth lumbar interspace. Spinal puncture was performed and 0.1 cc. of spinal fluid aspirated, followed by a rapid injection of solution. The patient was placed flat in bed, with the neck flexed, thirty seconds after injection. Blood pressure, maternal and fetal pulse, taken every five minutes for thirty minutes, and every fifteen minutes thereafter.

Buffered nupercaine in 1:200 solution was administered to 404 patients in dosage of 2.5 mg. Unbuffered nupercaine (2.5 mg. per cc. in five per cent glucose) was tried in 109 cases. Pontocaine hydrochloride in 5 mg. dosage was used in 115 cases. Novocaine in 27 cases in 50 mg. dosage was used. Forty-seven cases received metycaine in dosage of 33 mg. Seven cases received monocaine formate in 50 mg. dosage in crystalline form dissolved in 1 cc. of 10 per cent glucose.

In 3.3 per cent of the cases there was failure to obtain anesthesia.

The plan of anesthesia was to institute spinal puncture in multiparas at 5 or 6 cm. of cervical dilatation and in primiparas at 8 cm.

Sixty-five per cent of the cases received preliminary sedation. Morphine 0.01 Gm. alone or in combination with hyoscine 0.0005 Gm. was used most commonly.

Eighty-two per cent of the patients were under saddle block anesthesia for less than 30 per cent of their labor. The mean of the entire group was 19.4 per cent.

The duration of complete uterine analgesia from novocain and metycaine was from sixty to ninety minutes, perineal anesthesia usually lasting two