NUPERCAINE AND DEXTROSE 1:1500 SOLUTION FOR SPINAL ANESTHESIA *

A Preliminary Report of 450 Cases

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In 1934 Silverton (1) described the use of a relatively concentrated solution of percaine (1:200) in 6 per cent. dextrose for spinal anesthesia. The addition of 6 per cent. dextrose rendered the solution hyperbaric with a specific gravity of 1.024.

This is a preliminary report consisting of 450 cases in which a nupercaine-dextrose 1:1500 solution was employed. A 1:1500 dilution of nupercaine was chosen because it had been proved effective as a spinal anesthetic agent. This dilution was considered to be less toxic than the 1:200 dilution used by Silverton. When spinal anesthesia was indicated and when it was thought to be of advantage to use a hyperbaric solution, this combination of nupercaine and dextrose was employed for operations which were expected to last longer than one and one-half hours. Of the 450 cases in which this solution was employed, upper abdominal procedures were performed in 155 cases, lower abdominal procedures in 199 cases, and extra-abdominal procedures in 96 cases. The usual premedication was pentobarbital sodium 1½ grain (0.1 Gm.) two hours preoperatively and morphine sulphate 1/6 grain (0.01 Gm.) to 1/4 grain (0.015 Gm.) with scopolamine 1/150 grain (.0004 Gm.) to 1/100 grain (.0006 Gm.) one hour preoperatively.

Since it was impossible to obtain a commercially prepared hyperbaric nupercaine solution, we had special 10 cc. ampules of 10 per cent. dextrose in water prepared and made the 1:1500 dilution at the time of the spinal tap. The 10 per cent. dextrose in water was added to the calculated dose of 1:200 nupercaine solution to form a 1:1500 dilution of nupercaine-dextrose with a specific gravity of approximately 1.030.

The intrathecal injection was made in the second or third lumbar interspace with the patient lying on his side. If there was any doubt about obtaining too high a level of anesthesia in a particular case, the patient's head was elevated 2 to 5 degrees before the tap was performed; otherwise the table was level at the time of the spinal injection. The nupercaine-dextrose solution was injected at the rate of ½ cc. per second without withdrawing any spinal fluid. The patient was immediately turned to the dorsal position on completion of the injection. In the majority of cases ephedrin sulphate 50 mg. was administered sub-

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cutaneously just prior to the spinal tap. The factors used for estimating the dosage were the same as for any spinal anesthesia. The dosage of nupercaine ranged from 5 to 10 mg., or 7½ to 15 cc. of a nupercaine-dextrose 1:1500 solution. The dosage employed for upper abdominal anesthesia was usually one or two milligrams more than that employed for lower abdominal surgery.

The height of anesthesia could be readily controlled during the first ten minutes after injection of the nupercaine-dextrose solution by adjusting the level of the patient. During this time, the upper limit of anesthesia was carefully followed and the level of the patient adjusted accordingly. In lower abdominal operations, the height of sensory anesthesia was carried up to the level of the seventh or eighth thoracic nerve. For upper abdominal surgery, sensory anesthesia was permitted to ascend to the level of the fourth or fifth thoracic nerve. When fifteen minutes had elapsed after the injection, we did not hesitate to place the operating table in any position. After the desired level of anesthesia was attained, the majority of patients were then lightly anesthetized with cyclopropane before the operation was started. Of the 450 cases, 349 or 77.5 per cent. were immediately supplemented with a light plane of cyclopropane anesthesia. It has been our impression that this procedure, in many cases, materially aids in producing a safe and satisfactory spinal anesthesia (2).

Clinically there were no apparent toxic manifestations nor any instances of post-spinal headache or other neurological sequelae. The incidence and degree of circulatory and respiratory depression did not appear to be increased when using nupercaine-dextrose solution rather than other spinal anesthetic drugs. There were no deaths in this series which could be attributed to the anesthesia.

SUMMARY

We have observed that it is frequently convenient to employ a hyperbaric solution to produce spinal anesthesia. The use of nupercaine-dextrose 1:1500 solution supplemented with cyclopropane appeared to be a relatively safe method of obtaining prolonged muscular relaxation. Compared to the other commonly employed agents and technics, this combination of nupercaine-dextrose has been sufficiently satisfactory to warrant further trial.

REFERENCES

1. Silverton, R. J.: Spinal Analgesia: "Percaine"-ephedrine Technique, New Zealand J. Surg. 3: 223–234 (Jan.) 1934.
2. Sankey, B. B., and Potter, J. K.: Combined Spinal-Inhalation Anesthesia, The Ohio State M. J. 36: 29–30 (Jan.) 1940.