A RARE TOXIC EFFECT OF LOCAL ANAESTHESIA WITH LIGNOCAINE

A Case Report

BY

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METHODS of anaesthesia and analgesia in labour and delivery are varied and multiple. The problem of combining safety of mother and child with an effective method of pain relief is a rather difficult one to solve. So far no ideal method has been found.

Among other methods of anaesthesia for delivery, we use local anaesthesia of the pelvic floor in the form of a pudendal nerve block, with lignocaine (Esrcaine brand) with considerable success.

In the many years in which local anaesthetic drugs have been in general use, toxic manifestations have frequently been reported (Sadove, 1952; Steinhaus, 1957).

They have been roughly classified into:

1. Central nervous system effects, namely stimulation of the cerebral cortex and depression of the medulla.
2. Peripheral effects, those affecting cardiovascular and respiratory systems.
3. Allergic responses.

Psychic disturbance is not one of the well-recognized side-effects. We have been able to find only one such case described in detail (Bennett, 1957) and therefore believe that its occurrence is sufficiently rare to warrant publication of this report.

CASE REPORT

S. S., a 34-year-old woman, was admitted to the obstetrical department of the Beilinson Hospital in active labour, approximately at term of her first pregnancy.

On admission, physical examination revealed a well developed, small, rather thin woman in her 9th month of gestation. She was in good general condition, having fair uterine contractions at 5-minute intervals.

The antepartum period was essentially normal and all the laboratory data were within normal limits. There was no history of previous illness or fits. Menstrual history was normal.

After 8 hours of active labour, rectal examination revealed the uterine cervix to be fully dilated, but contractions had grown weaker. Two hours later the foetal head was still resting on the perineum. In view of secondary uterine inertia it was decided to aid by performing an outlet forceps delivery. Consequently, a pudendal nerve block with 1 per cent lignocaine solution with hyaluronidase was performed.

As soon as the needle was removed from the perineal skin, a mild twitching of the eyelids and facial muscles was noticed. The twitching became more pronounced and the facial muscles grew more tense and rigid. The patient’s jaw was set and she failed to respond to questions. Slight cyanosis of the face supervened. However, during this time, the trunk, arms and legs remained relaxed. Tendon reflexes remained normal and not exaggerated. The pulse rate was slightly more rapid than before and the systolic and diastolic blood pressures were only ten points elevated, i.e. to 130/90 mm Hg. Oxygen was immediately administered and an intravenous barbiturate given. Outlet forceps delivery was done and a living baby girl in good condition was extracted.

Approximately 3 minutes after it had started, this "state of irritation" of her face as well as the muscle rigidity were controlled and subsided partly. Nevertheless, slight muscle twitchings continued and the patient grimaced for at least 3 more minutes. The patient then exhibited marked mental excitation. She repeatedly announced that she was going to die. When the baby was shown to her she paid no attention. She complained that her tongue was paralyzed and that this paralysis was going to last exactly 1 hour, since it had to move down her body and into her legs. Every statement was repeated several times.

At this point she became resentful and argumentative, and displayed signs of disorientation. For the next three or four hours the patient remained under close observation. Her predominant mood was one of euphoria; she became talkative and displayed a zest for conversation. Gradually she became relaxed and finally fell asleep.

On the following day the patient appeared perfectly rational and displayed signs of disorientation. For the next three or four hours the patient remained under close observation. Her predominant mood was one of euphoria; she became talkative and displayed a zest for conversation. Gradually she became relaxed and finally fell asleep.
It is interesting to note that the patient had heard everything that was said in the room and had realized her mental confusion, yet was unable to control her behaviour.

COMMENT

This is a report of temporary psychic changes, which developed during administration of a pudendal nerve block anaesthesia with lignocaine for delivery.

Lignocaine (diethylaminoacet-2-6-xylidide hydrochloride) is a highly desirable local anaesthetic agent, according to Goodman and Gilman (1955). Since its synthesis by Lofgren and Lundquist (1946), it has steadily gained in popularity. Many authors (Gordh, 1949; Wiedling, 1952) have demonstrated its superiority to procaine in a number of properties; higher stability, lower incidence of side-effects and irritation, longer-lasting anaesthesia and higher potency. Sung and Truant (1954) studied the physiology and metabolism of lignocaine as compared to procaine and concluded that the first was superior.

Nevertheless, in spite of the paucity of reported reactions with this drug (Gordh, 1948, in a study of 800 cases who received lignocaine anaesthesia, has reported only two cases of convulsions; Dutton, 1955, has reported one case of convulsions after pudendal block), it may cause systemic toxic effects. Goodman and Gilman (1955) consider the drug as having approximately the same toxicity as procaine in 0.5 per cent solution; yet in 1 per cent solution it is 40 per cent and as 2 per cent it is 50 per cent more toxic than procaine. Hunter (1951), however, considers the drug twice as toxic as procaine in cats, mice, rabbits and white rats. It has also been said that “the toxicity of a local anaesthetic drug increases in geometrical, not arithmetical, progression with increase in concentration” (Betlach, 1941; Sadove, 1952).

Others believe this drug to be two to four times as safe as procaine (Carnegie and Hewer, 1950). Nevertheless, the total amount of lignocaine that may be injected has been fixed at 0.5 g. when used with epinephrine (Moore, 1953; New and Nonofficial Remedies, 1956). The maximal dose, according to others is 8 mg/kg (Mantindale, 1952); the toxic dose, therefore, should be considerably in excess of this figure. Since our patient weighed 54 kg, the maximal dose given to her should have been 432 mg.

At the obstetrical department of the Beilinson Hospital we use approximately 50 ml of a 1 per cent solution of lignocaine for the pudendal block. The total amount given, therefore, was 500 mg, i.e. 68 mg more than the maximal dose according to body weight, but not more than the dose recommended by Moore (1955) and others, and by usually accepted standards would not have been expected to produce a toxic reaction. In analyzing our case we came to the conclusion that the factors which may have contributed were the following:

1. The addition of 1500 I.U. Hyalase (hyaluronidase) which increases the diffusion of the anaesthetic solution, and may thus increase the rate of absorption.

2. Failure to add to the solution adrenaline which decreases the rate of absorption by vasoconstriction.

3. No sedation had been given during labour. It is evident that the two first factors contribute to increase the rate of absorption of the drug and consequently favour the establishment of a high blood level (Collins, 1952), which in our case led to a toxic reaction.

Eclamptic convulsion in this case was excluded according to the clinical picture of the seizure, and after thorough investigation.

Although the evidence implicating lignocaine is not definite, we believe that the temporary mental changes of our patient are compatible with a toxic effect. Also, there was no previous history of mental aberration or instability. Further proof may be that the disturbance started with a convulsion, which is known to be a toxic side-effect of local anaesthetics. We feel, therefore, that the subsequent mental changes were manifestations of cortical cerebral stimulation, brought on directly by the local anaesthetic, lignocaine.

SUMMARY

A rare case of short psychic disturbances due to a toxic effect from Esracaaine brand of lignocaine has been described. The possible contributing factors have been discussed.

REFERENCES

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