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A Review of Anaesthetic Practices in Gwelo African Hospital During 1970

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INTRODUCTION

During 1970, due to shortage of Government Medical Officers in Gwelo, especially of those with any training in anaesthetics, maximum use was made of techniques not involving general anaesthesia. These techniques are, of course, well known but it is felt that a brief description of them, and an evaluation of their use in practice, might be useful to those who find it difficult to obtain the services of a specialist anaesthetist.

METHODS AND THEIR EVALUATION

Other than general anaesthesia involving intravenous and inhalational agents (448 cases), four other methods were used:—

1. Local infiltration with lignocaine (333 cases).
2. Vein block, also known as Bier's block (102 cases).
3. Regional block, also by lignocaine (255 cases).
4. "Lytic cocktails" (249 cases).

Each of these methods will be briefly described and their scope and safety for various operations discussed.

1. Local infiltration

This method is used so widely already for minor procedures that it hardly needs further comment, except to mention two uses to which it was put.

(a) *Wiring of fractured jaw.*—Fourteen cases of fractured jaw were found to be adequately anaesthetised by the use of local anaesthetic on the gums, with a mandibular block on the side of the fracture, both administered after a lytic cocktail had been given intravenously (Pethidine + Promethazine + Chlorpromazine).

(b) *Caesarean section.*—Two operations were done using local anaesthetic alone. This method, although obviously very safe, is very time consuming, and the patient feels much discomfort during any but the most gentle of manipulations, and was therefore abandoned at an early stage.

2. Vein block

This was found to be suitable for most procedures involving the arm from the elbow down, and the foot, except where the veins have been opened by previous trauma. The technique is simple and reasonably safe in our experience:—

Enough solution of $\frac{1}{2}$ per cent. lignocaine or 1 per cent. procaine (plain), is drawn up in syringes. The dose varies from about 40 ml. for an adult arm to about 15 ml. for a 7-year-old child's arm. A small needle (1" 23 G is suitable) is inserted into a vein on the dorsum of the hand or foot, as far distally as possible. The limb is drained of blood

either by elevation, or by Esmarch's bandage, and the arterial supply occluded either by sphygmomanometer cuff or rubber tourniquet. This occlusion must be high on the limb if a secondary cuff for long procedures it to be applied. The lignocaine solution is now injected into the needle in the vein until the veins of the part are well filled. The part now becomes entirely anaesthetic to pain in about 30 seconds, and the only discomfort felt by the patient is from the occluding tourniquet or cuff. In long procedures a second tourniquet is placed below the first one since this area is already anaesthetised, and the original cuff removed. When the operation is finished the tourniquet or cuff is released without further precautions provided about five minutes have elapsed since the injection. The anaesthesia persists for about 15 minutes before wearing off. Many authorities advise leaving the cuff on for at least 30 minutes before release, but no ill effects were observed from having released the cuff much earlier. The only one side effect in 102 vein blocks occurred when the lignocaine had been inadvertently injected into the vein before the cuff had been inflated — the child had a convulsion, quickly controlled by injection of 10 mg Diazepam (Valium). There were no sequelae.

The advantages of the vein block are that the patient can go for a check X-ray immediately after reduction of a fracture, without special supervision, that African patients readily give consent for this anaesthetic, and that it is not important whether the patient has eaten recently or not. Vein blocks were used successfully for minor operations of the forearm, hand and foot, for reduction of fractures on the forearm bones (both open and closed), and for the reduction of supracondylar fractures of the humerus.

3. Regional blocks

(a) *Brachial block.*—40 ml. of 1 per cent. lignocaine are deposited around the brachial plexus behind the sub-clavian artery over the first rib. It is especially suited to procedures such as debridement and suture of extensive injuries to the hand or forearm. If adrenalin 1/200,000 is incorporated in the solution anaesthesia lasts for about 90 minutes. Three blocks were done, all successful.

(b) *Lumbar subarachnoid block.*—Only one Caesarean section was done with a spinal anaesthetic as it was felt that the potential complications were greater than those of caudal epidural block, without there being significant advantages. The one time it was used was when a caudal anaesthetic had failed and no anaesthetist was available.

(c) *Caudal epidural block.*—Generally this anaesthetic has not been very popular except for perineal operations such as cystoscopy or circumcision. We have found it to be much more versatile, reasonably safe, and easy to do, with a little practice. Few doctors who have not had post-graduate anaesthetic training are familiar with the technique which is described here in some detail.

PROCEDURE

(i) The patient is premedicated as for a general anaesthetic. Starvation is not essential.

(ii) Prepare a 1½ per cent. solution of lignocaine (with adrenalin 1:200,000 if the anaesthetic is required to work for longer than 30 minutes). The doses we have found to be fairly reliable are:—

20-25 ml. to block up to S1, i.e., for perineal procedures.

30 ml. for block up to L3. Operations on the lower leg.

35 ml. for inguinal and thigh operations — up to T11 blocked.

40 ml. for sub-umbilical operations — up to T9 blocked.

45 ml. for high abdominal operations — block as high as T5.

A separate syringe is prepared containing 2.5-5.0 mg of a vasopressor agent such as methoxamine (Vasoxine) or Metaraminol (Aramine) for routine intramuscular injection to all patients being blocked higher than T12, to eliminate the risk of hypotension, and to those who become hypotensive following injection.

(iii) The patient is placed in the prone position with a pillow under the thighs, to obtain approximately a 5 to 10° tilt to the lower lumbar spine. If the patient is very pregnant she is placed in the knee-elbow position to obtain the same slope.

(iv) The lower lumbar and sacral spines are palpated from above downwards until they become bifid at the sacral hiatus. The level at which this occurs shows a wide variation but it is usually around the top of the natal cleft. The hiatus is more easily felt in thin subjects and these are easier to obtain a good working experience on at first.

(v) After thoroughly cleaning the area with spirit, a two inch, 19 gauge needle is inserted headwards at about 45°, through the membrane covering the epidural space, and the plunger of the syringe is withdrawn to ensure that the needle is not in a vein or the subarachnoid space. The arachnoid mater ends at the lower pole of the

second sacral vertebra, and it is unlikely that this space will be entered through the sacral hiatus, but it is as well to check. Air in a syringe will easily be injected with no rebound on the plunger if the needle is correctly situated. The lignocaine solution is now injected, and a deep sigh from the patient often accompanies the beginning of a successful injection.

(vi) With the patient still prone the vasopressor may be given and an intravenous drip set up if desired. The patient is asked every few minutes for signs of a successful anaesthetic namely — weakness and paraesthesia in the legs, anaesthesia to painful stimuli, and drowsiness. Most caudals start working by 10 minutes, although a few only become effective after 20 minutes. Absent anal, abdominal, plantar and tendon reflexes are useful signs that the caudal is working when the patient is uncertain of what is being asked.

(vii) When the level of anaesthesia has reached the desired level or is static, the patient is turned over to the supine position and the blood pressure checked again before the operation is started. An assistant checks the pulse and blood pressure and reassures the patient. Many patients sleep through the operation unless they are purposely wakened. The duration of anaesthesia is about 30 minutes for plain lignocaine solutions, and this is extended to 1½-2 hours if adrenaline 1:200,000 is added. If longer periods of anaesthesia are required, a polythene catheter may be threaded through a wide-bore needle into the epidural space and brought out to the side of the patient and the anaesthesia continued by injecting the lignocaine through this catheter when the first dose is beginning to wear off, and tilting the table to a head-down position for a few minutes.

Side effects and complications:—

Hypotension.—This usually is only significant in high blocks, due to sympathetic paralysis. It is readily correctable by the injection of a pressor amine and head down position, as explained previously. It is wise, however, in all such high blocks, to have a reliable intravenous drip set up and to check the blood pressure at intervals.

Convulsions and excitement.—These side effects are generally the result of intravenous injection of the lignocaine-adrenaline mixture. Diazepam injection, either in the premedication or intravenously at the onset of these symptoms seems to be effective in controlling the fit or excitement. In 251 caudals administered, there were no cases of fits, and two cases of excitement. (Diazepam was not used routinely to premedicate the patients).

Failure.—In the 263 cases there were 12 failures in which another form of anaesthesia had to be used.

Pain at the injection site post-operatively.—Three patients complained that the site remained painful for as long as one week. Most patients had no pain by 48 hours.

Infection at injection site.—No patients had any overt signs of infection resulting from the injection.

Scope of the caudal epidural block

Low blocks (130 given). These were used for haemorrhoidectomy, perineal laceration repair, diagnostic dilatation and curettage, vesico-vaginal fistula repair, cystoscopy and urethral dilatation, circumcision and operations of the scrotum including hydrocoele repair.

Medium-low blocks (31 given). These were used for operations involving the leg below the knee, that is, reduction of fractured tibia and ankle, suture of large lacerations, etc.

Medium blocks (25 given). These gave satisfactory anaesthesia for insertion of Kuntscher Nails, inguinal hernia repair and similar operations.

Medium-High blocks (64 given). Used for appendectomy, ectopic pregnancy, hysterectomy, prostatectomy, Caesarean section, and other sub-umbilical laparotomies.

High block (1 given). Used for an intestinal obstruction due to adhesions.

Contra-indications to the caudal block.—These include:—

Age below 7 years.—The subarachnoid space is very near and the patients tend to be restless.

Epileptics.—The lignocaine used is obviously unsuitable because of its convulsant properties.

Patients in hypovolaemic shock.—The paralysis of the sympathetic could be disastrous. General anaesthesia is safer in these cases.

Advantages of the caudal block

In many cases it offers an alternative to general anaesthesia, especially for the single-handed doctor, and in those patients who do not welcome unconsciousness during their operation. The procedure is simple, safe, economical, and relaxation is generally excellent, provided care is taken with the technique. One may even ask the patient's permission for an additional operative procedure during the operation, for example, orchidectomy when a malignant tumour of the testis is discovered at operation for hydrocoele.

(d) *Lumbar Epidural Block.*—The procedure of placing the lignocaine solution directly into the

lumbar epidural space is preferred by many specialist anaesthetists and those who have the special needles and training for doing this block. Less local anaesthetic solution is required to produce the same effect, but there is a greater risk of subarachnoid injection and infection. This method of regional block was not used by us in 1970.

4. "*Lytic Cocktails*"

These are already widely used for analgesia-sedation during evacuations of the uterus for incomplete abortion. 233 incomplete abortions were evacuated using mixtures of Pethidine 100 mg. with either Diazepam 10 mg., or chlorpromazine 50-100 mg., given immediately before the operation intravenously. Cocktails were also used during the wiring of fractured jaws in conjunction with local anaesthesia.

SUMMARY

The methods for anaesthesia for surgical operations done in Gwelo African Hospital during the year of 1970 have been described and their uses discussed. By the judicious use of the methods described it is possible to avoid the need for general anaesthetics in many cases coming to the operating theatre.

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