MATERIAL & METHOD
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The present study of intravenous regional analgesia with CENTBUCRIDINE was conducted on a number of emergency and planned patients, of A.S.A. group I, operated upon at the M.L.B. Medical College Hospital, Jhansi during the year 1982-83.

The cases, who were to undergo limb surgery, were randomly selected after they were found to be fulfilling the following criteria.

1. Patients should be above 10 years of age to get better co-operation.

2. Duration of surgery should be over 20 minutes.

3. Septic cases were not included so as to avoid the danger of insemination of septic foci after the release of tourniquet.

4. Cases having thromboangitis obliterans were not selected, as, application of the tourniquet would be detrimental to them.

5. Cases with known history of convulsions and hypersensitivity to local analgesic drugs have not been taken.

6. Patients with the history of liver disease were omitted.

7. Patients with invisible veins were avoided.

8. Complicated compound fractures or mutilated crush injuries were excluded from the study, as there
was danger of leakage of the analgesic solution.

9. Patients in shock were omitted.

10. Uncooperative, nervous and patients unwilling for intravenous regional analgesia were also avoided.

PREPARATION OF THE PATIENTS:

The cases under study were first assured and reassured and were also explained about the type and technique of anaesthesia going to be employed in them. They were also made to sign a written consent regarding their acceptance of the technique.

Each patient was then subjected to detail general and systemic examination. Cardiovascular and nervous system were given a thorough check up so as to exclude any possibility of an incipient or apparent pathology.

Pre-operative fasting, if possible was advised for at least 6-8 hours before surgery, in case the technique should fail and general anaesthesia be required. Every case was subjected to sensitivity test 2-3 minims of centbuclidine. 0.1% was injected intradermally on the forearm and the appearence of erythema was watched. Any case where an erythema was noticed the technique was not adopted.

PREMEDICATION:

Usually no premedication was given except, in patients with discomfort or apprehension, where Diazepam 10 mg/or Pentazocine 30 mg were injected intramuscularly,
45-60 minutes before onset of the procedure.

**ARMAMENTARIUM**:

The apparatus required for the technique is as follows:
1. 0.5 percent centbucridine and distilled water.
2. Large syringe (50 ml is most convenient).
3. Two tourniquets.
5. Esmarch's bandage.

**DRUG**:

The drug used in this technique was a newly synthesized local analgesic, **CENTBUCRIDINE**. It was used in varying concentrations and depending upon the concentrations of the drug the patients were divided in four groups as per below:

- Group - I  .25%
- Group - II  .30%
- Group - III  .35%
- Group - IV  .40%

**TECHNIQUE**:

The whole procedure was carried out under full aseptic precautions.

Tourniquets were applied one above the other on the arm or the thigh depending upon the limb involved.
Proximal tourniquet was first inflated followed by inflation of the distal tourniquet and deflation of the former simultaneously, after the injection of the drug.

Venepuncture was done by a sterile Gordh needle, as near the site of operation as possible, after applying antiseptic lotions on the skin. The needle was then secured in-situ and flushed with distilled water to avoid blood clotting in it and obstructing the lumen.

Exsanguination was then done by lifting the arm or the leg above heart level so as to drain the extremity of the blood as far as possible. After keeping the limb elevated for five minutes the first tourniquet was inflated 20 mm of Hg above the systolic blood pressure, as mentioned above and time of inflation was noted. The limb was then brought down and the drug was injected. Esmarch's bandage was also used as an alternative method to the gravitational drainage for exsanguination.

The dose of centburcridine depended upon the following factors:

1. The extremity operated upon (upper or lower).
2. Type of operation.
3. Anticipated duration of operative procedure.

After injection of the drug appearance of any toxic reaction or discolouration of the skin was watched. For upper limb surgeries the dose ranged between 100-135 mg while that for lower limb was between 190-240 mg.
The drug available in .5% concentration was suitably diluted by the addition of distilled water to get the desired concentration, depending upon which group the patient belonged.

In case the surgery was prolonged repeat injections were given as and when required. The times of first and subsequent injections, if any, were recorded, as also the duration of effect of the first dose.

Intravenous infusion of 5% Dextrose in D/W was now started for parenteral therapy and blood pressure and pulse were monitored every 5-10 minutes after injection of the drug. Surgery was allowed only when the desired effect had been achieved, as assessed by the following schedule regarding the degree of analgesia.

**Excellent:**
Loss of sensory, touch, pin prick and no pain or discomfort from the operative procedure and there was no tourniquet pain felt by the patient.

**Good:**
Complete loss of touch and pain sensation. The sensory response to the maximum pressure was retained which if applied to the fingers or the toes nail was interpreted as burning sensation. And there was slight or no tourniquet pain.

**Fair:**
Incomplete anaesthesia with mild pain or discomfort from the operative procedure and severe or mild tourniquet
pain.

Poor:

Failure of anaesthesia and the surgical procedure was not possible under this technique and general anaesthesia had to be administered.

Patients exhibiting fair and poor responses had to be supplemented with general anaesthesia with nitrous oxide + Oxygen + Halothane or Trichloroethylene. During the course of surgery the pulse and blood pressure were regularly checked along with the continuous E.C.G. monitoring and evidence of any toxic symptoms noted as per following classification:

A. C.N.S.:

i) Stimulant To the cerebral cortex or medulla.

ii) Depressant (a) Respiratory system.
     (b) Vaso motor system.

B. PERIPHERAL EFFECT:

Cardiovascular (a) Direct action on the heart.
     (b) Action on the vascular bed.

C. ABNORMAL RESPONSE:

(a) Allergy
(b) Hypersensitivity
(c) Idiosyncracy.

After completion of surgery the tourniquet was deflated gradually over a period of five minutes and the time noted. A minimum of 45 minutes were required before
deflation was allowed, no matter how short the surgical procedure. Pulse and blood pressure were checked every 3-4 minutes for the first fifteen minutes and then every fifteen minutes for an hour after surgery. Any evidence of toxic reactions were noted and treated accordingly. Minor toxic reactions like giddiness were usually treated by the administration of oxygen only, for few minutes. The patients were then interrogated as to their acceptability of the technique and its comparison with any anaesthetic experience of the past.

The patients were then transferred to ward and were regularly visited for at least 24 hrs after the procedure. Any sign of subacute toxicity was also looked upon and was given a prompt treatment. Patients who wished were then discharged from the hospital.