INDIGENOUS TRILENE INHALER FOR OBSTETRIC ANALGESIA

(A Preliminary Report of a Clinical Trial)

by

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Introduction

A number of methods are discribed in the literature for producing analgesia in labour. They can be classified as

(1) Non-pharmacological methods.
(2) Sedatives and analgesics
(3) Inhalation methods
(4) Regional analgesia.

Non-pharmacological methods may not work well unless there is full co-operation of the patient, and the doctor incharge spends lot of time with the patient in the pre-natal period. Pharmacological methods and regional analgesia need expert supervision. These expert services may not be available for the full duration of labour or if available might be costly. Inhalation method is the only one which can be modified for self administration in such a way that it is safe for the mother and the child. Two important agents used in this technique are Nitrous oxide and Trilene. Trilene is a very potent analgesic and gives better results than nitrous oxide in nervous and highly strung patients. A number of vaporisers are designed for self administration of trilene. Most of them are imported and therefore very costly.

Recently a very simple, cheap and handy apparatus was designed by Dr. Tandon of All India Institute of Medical Sciences, New Delhi. A preliminary report of its working is presented here.

Material and Method

Most of primiparae or second parae coming to the obstetric department of the K. E. M. Hospital were selected for trial. A few multiparae were also included in the trial for comparative study and assessment of the degree of analgesia. Routine blood and urine examination was done in each case. Record of B. P., pulse rate and blood loss was maintained. The patient was tought how to use the inhaler for 0.3% and 0.5% concentration.

Construction of Instrument

The instrument consists of a metal chamber of high thermal conductivity, about eight inches long and 1½ inch in diameter. At the upper and of the instrument there are three attachments.

(1) The disc Dl on the top with an arrow mark—This indicates open and close position of trilene chamber by rotating the disc Dl.

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(2) *Mouth piece:* 'M' which can be detached and boiled after using it on one patient.

(3) *Metal strip:* S with a knob to open or close air dilution hole No. 2.

At the lower end of the instrument there are two holes C and D, C leading to chamber A through which expired gases go out. Opening D is controlled by a small disc D2 and leads to trilene chamber B containing absorbent packing. Chamber A and B have no connection with each other. They have two unidirectional valves X1 and X2. Inspired air comes from opening D through chamber B and X2 and is diluted by air coming from hole No. 1 and No. 2. When the patient breathes out, X2 closes and X1 opens and expired gases go out through chamber A. The instrument is held by the patient in her hand so that body heat gets transferred to trilene, furthermore patient's exhaled air is led through chamber A. This heated air and direct contact of patient with the instrument keeps trilene approximately at body temperature.

Working of Instrument

Rotate the disk D1 and open the upper end of trilene chamber, invert the instrument. Rotate the disk D2 by adjusting screw E in such a way that hole D comes in line with chamber B. Put 15 ml of liquid trilene inside the chamber B which will be absorbed by absorbant packing in chamber B. Make the instrument upright again. No trilene will overflow from either end, as all will be absorbed by the packing. Ask the patient to hold this instrument in her hand, and breath in and out through the mouth piece M. Trilene concentration of 0.35% or 0.5% can be delivered depending upon position of strips, that is whether hole No. 2 is open or closed.

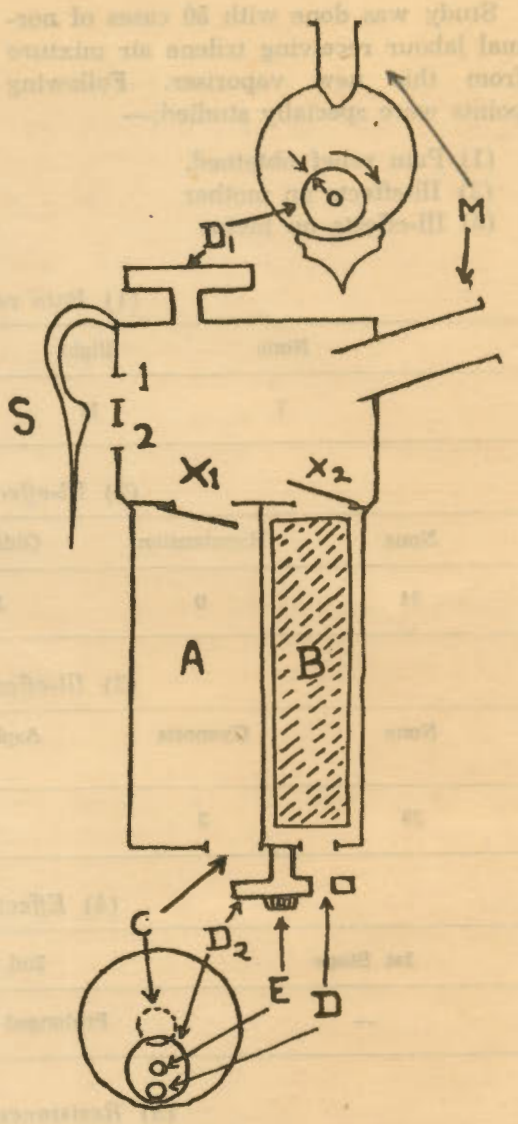

Fig. 1

When not in use rotate Disc D1 and D2 to close the trilene chamber B. The apparatus should be flushed with dry oxygen just before recharging. The mouth piece must be cleaned with tap water and then boiled for 15 minutes before giving to second patient. Inhaler when completly empty can accommodate 15 c.c. of trilene on each fresh charging.

Study was done with 50 cases of normal labour receiving trilene air mixture from this new vaporiser. Following points were specially studied:—

(1) Pain relief obtained,
(2) Ill-effects on mother
(3) Ill-effects on foetus
(4) Effect on labour
(5) Resistance to respiration
(6) Concentration of trilene
(7) Parity of the patients.

As the spectrophotometer or gaschromatography was not available, it could not be done.

(1) *Pain relief obtained*

None	Slight	Good	Excellent
7	11	24	8

(2) *Ill-effect on mother*

None	Hypotension	Giddiness	Cyanosis	Nausea
34	0	11	0	5

(3) *Ill-effects on foetus*

None	Cyanosis	Asphyxia	Respiratory depression	Any Other
39	3	1	7	—

(4) *Effect on labour*

1st Stage	2nd Stage	3rd Stage
—	Prolonged in 2 cases	—

(5) *Resistance to respiration*

Inspiration	Expiration
15 Lit/mt — 5 mm of Water 30 Lit/mt — 8-9 mm of Water	15 Lit/mt — Less than 3 mm. of water 30 Lit/mt — 6 mm. of water

(7) *Parity*

I	II	III	IV	V	VI	VII	VIII	IX
15	13	12	7	1	1	—	1	—

Discussion

All the patients were trained to use the instrument and even illiterate patients found it very easy to use. The apparatus has negligible resistance and hence can be used for a long time without putting a burden on respiratory muscles. The concentration of trilene as claimed by the designer could not be checked as facilities for doing it were not available, but from the clinical trial it appears that the concentration given by this vaporiser is sufficient to give safe obstetric analgesia. The majority of cases were primiparae, secondparae and thirdparae and as the pain relief in the majority of cases was good, the instrument should be considered efficient. Other trilene vaporisers available for obstetric analgesia are — Emotril, Tecota, Burns-Benson, Duke, Cyprane etc. One great disadvantage with these vaporisers for us is that they are imported. In Emotril temperature variation is controlled by water jacket and in Bellow type thermostat, while in Tecota, metalic strip acting on a value provides thermostatic control. In Burns-Benson there is no thermostat but a needle valve cut out which does not allow fluid to go in excess. In the Duke type there is no temperature control while in the Cyprane concentration is controlled by air bypass only. The vaporiser presently described is the only one which utilises the patient's own heat for temperature compensation. Emotril, Tecota, and Burns-Benson are quite bulky, and only Duke and Cyprane can compare with this vaporiser in handiness.

There are some practical difficulties which we came across during the trial. Once the vaporiser is charged and if during the use it is not fully exhausted, fresh recharging causes overflow from the other side. A peculier thing can happen in humid weather like in Bombay, where the moisture in the atmosphere gets deposited in the sponge which holds trilene. In this situation too trilene can overflow. If the instrument is flushed with oxygen or any other dry gas this problem can be solved. Sterilization of the mouth piece is very easy but some amount of expired gases enter the upper chamber, though in negligible amounts and are likely to contaminate the instrument.

On the whole this should be considered as a good and safe instrument for obstetric analgesia.

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