LOW VOLTAGE ELECTRIC STIMULATION V/S VALETHAMATE BROMIDE FOR ACCELERATION OF LABOUR

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SUMMARY

The trial was conducted using valethemate bromide (Epidosin) and low voltage electrical stimulation of the cervix using cervilator (ripener) in 200 normal full term women both primigravidas and multiparas with no clinical disproportion, in order to study the effect on cervical dilatation pattern. In addition, 100 cases (50 primigravidas and 50 multiparas) were studied as a control sample. The partograms were plotted meticulously in these cases, in order to study the average dilatation time and rate of cervical dilatation. It is observed that Valethemate bromide and cervilator reduces the first stage of labour by 2.5 hrs. and 4.5 hrs. respectively in primigravida. In multiparas they reduced the first stage of labour by approximately 3 hours. However, the prohibitive cost, delicacy of the instrument are the setbacks for the widespread use of the cervilator. Both Valethemate bromide and cervilator did not have serious side effects.

It has righly been said that labour is normal in retrospect. A woman in labour gives many anxious moments to the obstetrician till the end of 2nd stage. Any method that aims at cutting short the duration of labour is welcome both to the patient and the obstetrician. It has been proved that cervical dilatation is one of the important factor that determines the duration of labour. The uterine action, cephalo-pelvic disproportion and the presentation are some of the other factors which determine the course of labour. Sometimes it is observed that though there are good uterine contractions, and descent of the presenting part, the cervix fails to dilate or dilates very slowly. The condition has been grouped as "functional cervical dystocia". It is probably due to overactivity of the smooth muscle of the cervix.

Considering the importance of the problem of cervical dystocia, a trial was conducted in 200 patients, including primipara and multipara using valethamate bromide ('Epidosin') and low voltage

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electrical stimulation of the cervix using cervilator or cervical ripener (Eden). (Fig. 1).

Material and Methods

Two hundred patients, both primigravida and multiparas in labour were selected for the study from the labour wards of B.Y.L. Nair Ch. Hospital and T.N. Medical College, Bombay. One hundred patients consisting of 50 primigravidas and 50 multiparas acted as a control sample. All the cases were full term, normal with vertex presentation. Any case with slightest deviation from normal was not included in the study.

In all the 3 groups time taken for full dilation of the cervix was noted and the rate of dilatation was observed. The partograms were plotted to know the progressive dilatations of the cervix with duration of the first stage in hours on abscissa and dilatation in cms. on ordinate.

Observations

The cases were from the age group of 18-30 years. The majority (60%), were from the age group of 20-25 years. In the multiparous group, the majority (70%) were of the parity 2 and 3. Only 1 patient of the epidosin group was of parity 5.

Table I shows the time taken for the complete dilation of the cervix from 2-3 cms. in primigravida. In epidosin treated group (A), the average time taken for full dilatation of the cervix was 10 hours, whereas in a group (B) where cervix was stimulated using low voltage electric current (cervilator) the average time was 8 hours. In a control group (C) the average time was 12.5 hours. The average rate of dilatation was 1 cm./75 min. in a control group (C), 1 cm./60 min. in epidosin treated group (A) and 1 cm./48 min. in cervilator treated group (B).

Table II shows the same in multiparas. The average dilatation time was 6.5 hrs. in a control group (C), 3.6 hrs. in epidosin treated group (A) and 3.5 hrs. on cervilator treated group (B). The average rate of dilatation was 1 cm./21.6 min. in epidosin group (A), 1 cm./21 min. in cervilator group (B) and 1 cm./40 min. in control group (C).

Tables III and IV show the side effects of Valethamate bromide and cervical ripener (cervilator) respectively. Transient tachycardia more than 100 beats per minute and dryness of mouth were the commonest side effects with Valethamate bromide (viz. 17% and 12% respectively). As against these when cervilator was used 12% of the cases showed bleeding from the site of application which was

TABLE I

Time Taken for Complete Dilatation of Cervix from 2-3 cms in Primigravida

	No.	Average dil. time (hrs.)	Range (hrs.)	Average rate of dilatation
Group A (Epidosin)	50	10 hrs.	2 hrs. to 26 hrs.	1 cm/60 min.
Group B (Cervilator)	50	8 hrs.	1 hr. and 30 min. to 24 hrs.	1 cm/48 min.
Group C (Control)	50	12.5 hrs.	6 hrs. to 56 hrs.	1 cm/75 min.

TABLE II
Time Taken for Complete Dilatation of Cervix from 2-3 cms in Multiparas

	No.	Average dil. time (hrs.)	Range (hrs.)	Average rate of dilatation
Group A (Epidosin)	50	3.6 hrs.	1 hr. and 30 min. to 8 hrs.	1 cm/21.6 min.
Group B (Cervilator)	50	3.5 hrs.	1 hr. and 27 min. to 8 hrs. and 30 min.	1 cm/21 min.
Group C (Control)	50	6.5 hrs.	2.00 hrs. to 18 hrs.	1 cm/40 min.

TABLE III
Side Effects of Valethemal bromide (Epidosin)

	No. of cases	(%)
Transient tachycardia >100/min.	17	(17)
FHR Variability >.15 beats/min.	4	(4)
Dryness of mouth	12	(12)
Vomiting and nausea	2	(2)
Rise in temperature	1	(1)
Rash	0	(0)

TABLE IV
Side Effects of Cervilator

	No.	(%)
(1) Pain during application	21	(21)
(2) Bleeding from site of application	12	(12)
(3) ? Burns at the site application	30	(30)

on the posterior lip of the cervix. In 30% of the cases, when speculum examination was done on 7th Post Partum day, the cervix showed brownish-white marks similar to cauterisation. However, on examination at 6th week the cervix appeared normal.

Discussion

The factors involved in the cervical dilatation and effacement are poorly understood. It is well known that firm cervix of non-pregnant state softens only in late pregnancy and gets dilated few days before onset of labour. The process of ripening and effacement is influenced by hormones. Any method which aids in reducing the tone of the cervix will definitely favour early dilatation and accelerate labour. We have studied here effect of Epidosin (Valethamate bromide) and low voltage electrical stimulation of the cervix using cervical ripener (cervilator, Eden) on the cervical dilation patterns and their usefulness in shortening the first stage of labour.

Epidosin belongs to a group of esters with a quaternary N. atom with formula ($CH_3 — CH_2 — CH_3 — C_6H_5 — COO — CH_2 — CH_2\ N(C_2H_5)_2\ CH_3$) Br. i.e. 1 Phenyl — 2 methyl — valerianic acid — diethyl — amnio — ethyl ester — bromomethylate

It is anticholinergic in its action on smooth muscle of the internal organs. It also has musculotrophic action like papaverine. It was observed that it relieves the spasm of the cervix by parasympathe-

tic over excitement and has musculotrophic action on uterine musculature and thereby helps in the dilatation of the cervix (Beck, 1956). He observed that first stage of labour was shortened by 18-30% calculated from the first injection. In our study of 100 patients (50 primigravidas and 50 multiparas), we could demonstrate appreciable acceleration of the first stage of labour as compared to control. Our results with valethamate bromide (Epidosin) were similar to many other workers (Anjaneyulu, 1978, Water 1957 *et al*).

Cervical ripener (cervilator) is designed to apply, to the uterine cervix, an electric current of low frequency, intermittently (with 10 seconds duration and 10 seconds interval) in order to induce labour pains or accelerate the "delivery preparation condition".

Treatment by this unit for a pregnant women after the expected date of delivery, as an outpatient, for 15-20 minutes per day through 3 to 4 days, will bring about the ripe condition of the uterine cervix, resulting in labour pains. It is also used to enhance cervical dilatation during the first stage of labour. This unit can be used without any hazards or side effects to the fetus and the mother.

The equipment consists of the following items: (Fig. 1).

(1) Main unit including auto-timer.
(2) Power cord.
(3) Forceps type current applicator. (Fig. 1).
(4) Stimulation current cord.
(5) Grounding wire.
(6) Fuse (0.5A).

After connecting the power cord and stimulation current cord, the power switch is turned on. The voltmeter for stimulation current indicates same value for 10 seconds and then returns to zero, remaining there for 10 seconds, and again indicates the same value for 10 seconds and then returns to zero, and so on. Thus the meter continues to indicate the same cycle repeatedly. It means that current stimulation is given 3 times per minute with 10 seconds duration and 10 seconds interval.

After confirming the above steps, the plug of the forceps type current applicator is connected to the connector of the stimulation current cord. The electrode is sterilized by boiling before use.

The current applicator is applied to the uterine cervix.

In our study of 100 women treated with cervical ripener the first stage of labour could be shortened in primigravida by 4.5 hrs. and in multiparas by 3 hrs. There were no untoward effects on the mother or the newborn. It was observed that low voltage electrical stimulation is more effective in accelerating first stage of labour than Valethamate bromide. However, valethamate bromide (Epidosin) is easily available, cheap and easy to administer as compared to cervical ripener. The prohibitive cost of the instrument and its delicacy probably would prevent its wide spread use.

References

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See Fig. on Art Paper IV