

VALIUM (DIAZEPAM) FOR CERVICAL DILATATION DURING LABOUR

by

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The importance of the influence of emotion upon pregnancy and parturition has been recognized during the last few years. Fear, an emotion of variable intensity, plays an important role in obstetric practice, particularly during labour in a primipara. Superstition, civilization and culture have brought influences upon the minds of women, which have introduced justifiable fears and anxieties concerning labour. Fear and anticipation have given rise to natural protective tension in the mind and muscle of the cervix uteri. Excessive stimulation of the motor mechanism of the sympathetic nervous system increases the tone of the circular muscle fibres of the cervix uteri. Resistance in these muscles produces pain by stimulating the sensory nerve endings in the uterus. Thus a disturbance of polarity occurs, leading to incomplete relaxation of the uterus and spasm of cervix uteri. This is known as the Fear-tension-pain syndrome, described by Grantley Dick Read. Fear, tension and pain are three evils opposed to the natural course of childbirth. In addition to antenatal preparation of the patient, analgesics and

tranquilizers are widely used during labour to remove fear and relieve pain. Besides, certain drugs employed for the removal of fear and pain are known to have a labour shortening effect. Valium (Diazepam), a tranquilizing agent, has been tried out extensively for this purpose; and it has been found to shorten the duration of labour.

The present study was designed and undertaken to evaluate the effect and utility of the drug among Indian women. Apparently, this is the first such trial in India.

Method and Material

The patients included in the trial fulfilled the following previously set criteria:

1. Primiparity.
2. Age between 20-30 years.
3. Vertex presentation.
4. Absence of cephalo-pelvic dysproportion.
5. Absence of any major antenatal complications.
6. Cervix three finger dilated at the commencement of the study.

A total of 200 patients were included in the trial, which was carried out in the labour wards of the Nowrosjee Wadia Maternity Hospital, Bombay, between the months of August 1964 and February 1965. In order to eliminate subjective errors, a double blind controlled study was done. Ninety-nine patients received placebo ampoules of 2 ml. intramuscularly,

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whereas one hundred and one patients were injected with 10 mg (2 ml) of 'Valium' by the same route. The ampoules were numbered serially and administered in consecutive order, the number on the ampoules being entered on the patients' chart. The identifying code of the method by which the drug and the placebo had been placed in randomized order, was kept sealed until the investigation was completed. Whether a patient under observation received the drug or the placebo was known to none of the investigators. The drug or the placebo was administered when cervical dilatation had reached three fingers. Six patients, in both placebo and 'Valium' group, received pethidine 100 mg intramuscularly, in addition, for various reasons. No medication other than these was administered.

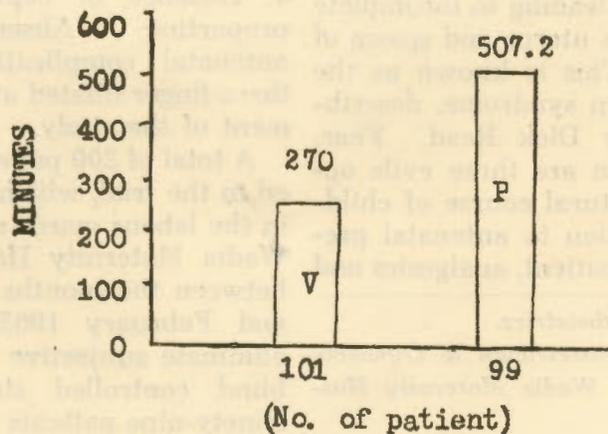
Throughout the study, only one of us (R.H.C.) did all the examinations and the following observations were recorded on a specially prepared pro-

forma. The blood pressure, the frequency and duration of uterine contractions and the foetal heart rate were recorded. The condition of the cervix, the station of the head, the position of the occiput and the presence or otherwise of caput and moulding were noted. Side-effects or complications, such as maternal or foetal distress were also carefully looked for. The condition of the baby at birth and during puerperium was carefully observed. Vaginal examinations were made at the end of every two hours, to note the time taken for the cervix to progress from 3 finger dilatation to full dilatation. The average duration of labour for each group was later calculated.

Results

1. The average time taken for the cervix to progress to full dilatation, from the stage of three finger dilatation was 507.2 minutes in the control group and 270 minutes in the 'Valium' group; as shown in the graph:

Time taken for the cervix to progress from 3 finger dilatation to full dilatation in minutes.



2. On an average, when cervix was fully dilated, the uterine contractions occurred at an interval of 5.7 min. in the placebo group and 6.2 mins. in the 'Valium' group.

TABLE I

Total No. of cases	Frequency of uterine contractions in minutes	
	Before injection	After injection
		(cervix fully dilated)
Placebo group	99	22.2
Valium group	101	17.7
		5.7
		6.2

3. The average duration of uterine contractions when the cervix was fully dilated was 55 seconds in the control group and 53.8 seconds in the Valium group.

TABLE II

Total No. of cases	Duration of uterine contractions in seconds	
	Before injection	After injection
		(cervix fully dilated)
Placebo group	99	29.1
Valium group	101	32.8
		55.0
		53.8

4. On an average, no effects were noted on the maternal pulse rate due to the administration of 'Valium' or placebo.

TABLE III

Total No. of cases	Maternal pulse rate/minutes	
	Before injection	After injection
Placebo group	99	84.2
Valium group	101	83.7
		91.1
		88.6

5. Similarly, no appreciable change was observed in the average heart rate after the administration of the drug or placebo.

TABLE IV

Total No. of cases	Foetal heart sounds/minutes	
	Before injection	After injection
Placebo group	99	145.3
Valium group	101	143.6
		145.6
		145.1

Only two newborn in the 'Valium' group had complications. One child was asphyxiated at birth but was resuscitated and another child was irritable for a few days.

6. The assessment of analgesic effect was difficult, but apparently no significant effect was observed in either group.

Discussion

'Valium' Ro 5-2807 (Diazepam), a benzodiazepine derivative, is an analogue of Chlordiazepoxide (Librium) and is credited with approximately 5 times the potency of Librium as tranquilizer and muscle-relaxant. The chemical designation of Valium is 7-chloro-1, 3 - dyhydro - 1 - methyl - 5-phenyl-2H-1, 4-benzodiazepin-2-one. It is a colourless crystalline base, which is insoluble in water. Thorough clinical investigations and tests carried out in 5,761 pregnant women over a period of three years have demonstrated that Valium can substantially reduce the duration of normal labour without any danger to the mother or child and it is decisive help in various pathological states of pregnancy. It is safely recommended in threatened premature delivery, pre-

mature rupture of membranes, placenta praevia and toxæmia of pregnancy. The present study was chiefly concerned with the effect of Valium on the duration of labour. The average time taken for the cervix to reach full dilatation was considerably shorter (270 minutes) in the Valium group, as compared with the average time of 507.2 minutes required by the 'control' group. Thus an average reduction of 237.2 minutes was observed and the later phase of the first stage of labour appeared to be shortened to less than half the normal (control) average time.

The mode of action of the drug on the uterus is not known. Valium is known to have a direct action on uterine musculature, i.e. improvement of the quality of the uterine contractions, resulting in more effective cervical dilatation, even if their intensity and frequency remain unchanged. This was verified in the present study. A second indirect effect brought about by the central anxiolytic property of Valium is to interrupt the vicious circle of Fear-tension-pain and improve uterine action. Valium also decreases the resistance offered by the cervix to dilatation. This is by direct action on smooth and striated muscles of the birth canal or by its well-known effects on central nervous system. Husslein is of the opinion that Valium acts by increasing the parasympathetic tonus and by decreasing the sympathetic tonus. This would result in a diminished resistance to dilatation of the birth canal.

Berger, Husslein have recorded a considerable reduction in the duration of labour, averaging between

25-30%. Since the acceleration takes place exclusively during the phase of dilatation, the choice of the moment at which Valium is administered is of paramount importance. If given too early, its effect passes off before the period of moderate dilatation and is felt as pronounced sedation. Given too late, the same effect occurs without accelerating the second stage or expulsion of the placenta. Extensive experience has led to the opinion that in primiparae three fingers and in multiparae two fingers dilatation is the most opportune time to inject Valium for the purpose of accelerating labour.

In the present study, Valium did not show any major side-effects on the mother. The blood pressure and maternal pulse remained unaffected. Besides, due to the excellent central anxiolytic action of Valium it is very useful in distressed women. Administration of Valium leads to a state of calm expectation and enables the parturient to participate actively in the process of labour.

Valium, administered during labour, did not have any detrimental effect on the foetus or the newborn. This is considered as one of the main advantages of Valium over other drugs, like pethidine which have a depressive effect on the newborn. Berger as well as Husslein have proved the safety of Valium by Apgar scoring and examination of pH, pCO₂ alkaline reserve and oxygen saturation in the blood of the newborn.

Summary and Conclusions

A double blind study was carried out in 200 parturients, ninety-nine whom served as control and rece

the placebo injection during the first stage of labour, and one hundred and one received 10 mg, 2 ml, of Valium intramuscularly. The object of the study was to find out whether administration of 'Valium' shortens the duration of labour.

It was found that in the Valium group, the average time taken from three fingers to full dilatation of cervix was 270 minutes, while those in the placebo group required 507-2 minutes. Thus a striking acceleration of labour was observed in the Valium group.

The shortening of labour by Valium did not produce any major side-effects on the mother and the infant.

Valium, with its capacity to curtail the length of labour, with its undisputed tranquilizing effect and freedom from adverse effects on the mother or the child, should definitely be a part of the obstetrician's repertoire.

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