

# PETHIDINE HYDROCHLORIDE IN LABOUR

(Studies of 28 Cases with the Aid of Lorand's Tocograph)

by

A. K. GIRI\*, M.B.B.S., D.G.O., M.O. (Cal.)

and

C. L. MUKHERJEE\*\*, M.O. (Cal.), Ph.D. (Glas.), F.R.C.O.G. (Lond.)

## Introduction

In recent years, various drugs are in use to alleviate pain and discomfort in labour. Demerol claims to be one of these agents with mounting popularity because of its good analgesic effect, wide margin of safety, and property of hastening labour.

In order to note the effect of the drug on uterine contractions and the course of labour, twenty-eight cases were studied in S.S.K.M. Hospital in 1957-58 with the aid of Lorand's tocograph (Table I).

Except twice in two cases (including one case both in early and late

first stage) and thrice in the third, 100 mgm. of the drug, irrespective of the weight of the patient, was used only once, intramuscularly. The cases did not reveal any clinical abnormality requiring consideration, except occipito-posterior position in 6 cases (one primigravida and 6 multiparae).

Apart from studying different components of uterine contractions, the following clinical effects were also observed:—

- (i) Analgesia.
- (ii) Duration of labour.
- (iii) Third stage and post-

TABLE 1

	False pain	Early first * stage	Late first stage	With pitocin
Primi	2	6	3	3
Multi	0	8	6	1

\* Early first stage was considered up to two fingers dilatation of the os.

\* Resident Surgeon and Additional Lecturer, Department of Obstetrics and Gynaecology, Nilratan Sircar Medical College, Calcutta.

\*\* Director, Department of Obstetrics and Gynaecology, Seth Sukhlal Karnani Memorial Hospital, Calcutta.

- partum haemorrhage.
- (iv) Side effects on the mother and the foetus.

Routine vaginal examinations, before and 1 hour after the use of the drug, were performed to gain some idea about its effect on cervical dilatation.

## Results

TABLE 2

		False pain		Early first stage		Late first stage	
		Before	After	Before	After	Before	After
Tone in m.m.	Primi	5.85	6.9	5.96	6.65	4.3	4.3
Tone in m.m.	Multi	—	—	3.46	3.9	4.4	5.3
Amplitude in m.m.		6.3	4.35	4.6	5.02	5.53	5.08
Duration in seconds		136.95	134.25	86.89	80.07	103.21	88.37
No. of contractions per hour		8	9	10.2	14.2	14.7	17.6

*False Pain*

In both the cases, frequency of contraction increased 1 per hour after the use of the drug, without considerable alteration in the tone, amplitude, duration and rhythm. Rhythm was regular all along. Pain was abolished and was not felt even when the effect of the drug was over. Labour ensued 3 and 10 days later.

*Labour*

*Tone.* Tone was altered in none in the early or late first stage, either in primigravidae or in multiparæ. Primigravidae as a whole revealed higher tone than the rest.

*Amplitude.* As the amplitude, duration and frequency did not behave differently between the primigravidae and multiparæ, they had been considered irrespective of parity. Apparent change in amplitude in early and late first stage had been proved to be insignificant.

*Duration.* Again, the apparent shortening of duration of contraction by 6 seconds in early first stage and

14 seconds in the late first stage did not leave any significant value.

*Frequency of Contraction.* In the early first stage, contractions increased from 10.2 to 14.2 per hour on an average resulting in the difference of 4 per hour after the use of the drug ( $t^2-11.65$ ).

In the late first stage the tocograph depicted 14.7 and 17.6 contractions per hour on an average, before and after the use of the drug respectively. This led to an increase in the number of contractions of 2.9 per hour with low significance ( $t^2-4.73$ ).

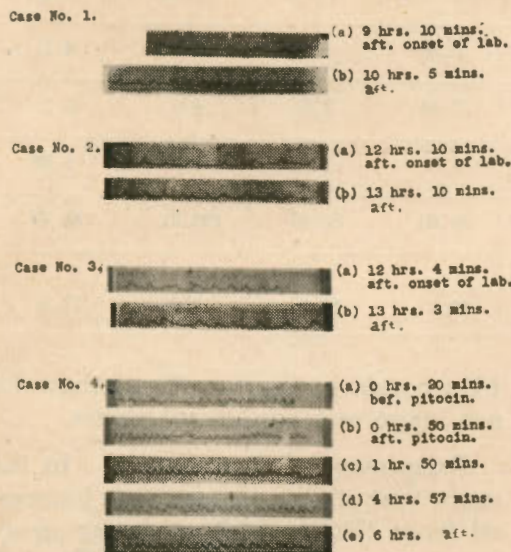
*Rhythm.* Rhythm was little affected by the drug.

*Pitocin and Pethidine Hydrochloride*

Amongst 4 cases in this series, in 2 cases the drug was used by intravenous drip (150 mgm. in 540 c.c. 5% glucose-saline bottle 16-32 drops per minute) along with pitocin and in the other two by intramuscular injection of 100 mgm. of the drug. Neither frequency nor pattern of contraction did show any appreciable change.



(Four tocographic tracings are presented)



Case No. 1  
M.M. Multipara. (a) She received peth. hydrochlor. 100 mgm I.M. in early first stage (Os 2 fingers, Cx. partly taken up) arrow mark — Graph shows increase in frequency of contractions after the administration of the drug. Contractions were markedly increased about one hour after the injection of the drug (b). Contractions were regular.  
Duration of labour — 22 hrs.

Case No. 2  
R.K. Multipara. Gr. (a) Peth. hydrochlor. 100 mgm I.M. arrow mark, before which contractions were infrequent. After injection of the drug contractions were recorded at shorter interval. Gr. (a) & (b). Contractions are gradually diminishing in number about one and half hours after-end of gr. (b).

Case No. 3  
M.G. 1st gr. Peth. hydr. 100 mgm I.M. was injected in late first stage (Os 3 fin. Cx taken up) — arrow Gr. (a) Frequency of contractions slightly increased.  
Duration of labour — 18 hrs. 44 mins.

Case No. 4  
B. 3rd Gr. Pitocin was started (2 units in 540 c.c. 5% glucose saline) 16 drops per minute — arrow gr. (a), successive graphs show gradual increase in frequency and amplitude of contractions. Some irregularity of contractions and compound waves were observed in gr. (d). Peth. Hyd. 100 mgm was injected I.M. — arrow gr. (d). Irregular contractions persisted after the injection of the drug.  
Duration of labour — 9 hrs. 45 mins.

*Analgesia*

TABLE 3

	Good	Moderate	Poor	Nil
False pain	100%			
Early first stage	63.9%	21.3%	7.1%	7.1%
Late first stage	55.5%	22.2%	11.1%	11.1%
With pitocin	Not satisfactory			

*Duration of Labour*

Labour lasted on an average 29 hours and 9 minutes and the same in multiparae had been 13 hours and 47 minutes. This included 8 cases of prolonged labour. Four of these were due to weak uterine contractions of small amplitude and duration at long intervals and the cause

in the rest was attributed to thick cervix and occipito-posterior position with or without weak uterine contractions.

Average time of normal labour cases in primigravidae was 15 hrs. 5 minutes in the series as compared to 16 hrs. 36 minutes in the control. The same in multiparae were 8 hrs.



44 minutes and 10 hrs. 24 minutes in the present series and the control respectively.

*Third Stage.* Nine minutes were the average duration of the third stage. But in 3 cases in whom demerol was injected within two and a half hours of completion of labour, the third stage lasted only for 4 minutes on an average.

*Side Effects in Babies.* Three babies (10.5%) were asphyxiated including one in which cyanosis persisted for a few minutes though respiration started and maintained usual rate and rhythm. Asphyxia was relieved with lethidrone 2 mgm. I.V. into umbilical vein in 2 cases to whom pethidine hydrochlor was pushed 1 hr. 14 minutes and 2 hrs. 30 minutes before the delivery. Two babies suffered from some lethargy during the first 24 hrs.

*Side Effects in Mother.* Vomiting was noticed in 7 cases (25%) in whom the drug was used within 4 hrs. after a meal. Four cases complained of giddiness. Blood pressure was not lowered in any case even with intravenous drip.

#### *Discussion*

Demerol, used in false labour, could alleviate the pain temporarily because of its analgesic property but not due to inhibition of uterine contractions. Though contractions of lower segment could not be recorded with the help of Lorand's tocograph, the tracings on the upper segment did not reveal any abnormality.

Pethidine hydrochloride increased the frequency of contractions. This signifies that the drug claims some

oxytocic property. Though its oxytocic property has not been clearly defined, it does not suppress or inhibit the uterine contractions; this has been admitted by Caldero Barcia and Alvarez (1932), Wilson et al (1951), Theobald (1953), Bourne and William (1958). Jeffcoate (1952) remarked, "If pethidine be given intravenously in cases of normal labour even in sufficient dosage to cause unconsciousness it will not suppress uterine action." Pethidine hydrochloride ultimately turns out to be an oxytocic agent like dihydroergotamine which was formerly believed to be an antispasmodic drug.

The effect of the drug during oxytocin drip in this small series, with dosage not up to maximum limit, failed to prove the statement of Jeffcoate: "Pethidine was given intravenously and irregular contractions were suppressed".

Labour in normal cases was completed a little earlier than in the control series. There are different authors, like Mackenzie (1943), Gillberg and Dixon (1943), Gallen and Prescott (1944), who are of the opinion that the drug cuts short the labour. Higher incidence of prolonged labour was due to the fact that pethidine hydrochlor was used particularly in prolonged labour. It was not the effect of the drug.

Analgesia was more effective in the early first stage, when the pains were milder than in the late first stage. During oxytocin drip the result was not appreciable.

Asphyxia developed in some babies when the drug was used within 3 hrs. of the completion of labour.

### Summary and Conclusion

Twenty-eight cases were studied with pethidine hydrochloride, with false pains, in the early first stage, the late first stage and during oxytocin drip.

The pethidine hydrochloride has been proved to be a mild oxytocic agent. It does not alter the rhythm of contractions. The drug relieves pain of labour easily and effectively.

Side effects are few.

We are grateful to the Surgeon-Superintendent, S. S. K. M. Hospital, in kindly allowing us to publish the case records.

### References

1. Bourne A. H. & William L. H.: Recent Advances in Obstetrics & Gynaecology; 1958.
2. Gallen B. & Prescott: B.M.J.; 1, 176, 1944.
3. Gillberg G. & Dixon A. B.: Am. J. Obst. & Gyn.; 45, 320, 1943.
4. Goodman L. S. & Gillman A.: Pharmacological Basis of Therapeutics, 1956.
5. Holland E. & Bourne A.: British Obst. & Gyn. Practice; 1959.
6. Jeffcoate T. N. A.: Jour. Obst. & Gyn. Br. Emp.; 59, 658.