OXYTOCIN AND NEONATAL JAUNDICE

by

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Much has been discussed about the use of oxytocin for induction and acceleration of labour and its possible association with neonatal jaundice or hyperbilirubinemia. Many observers (Chalmers *et al* 1975, 76; Oski, 1975) have linked hyperbilirubinemia of the babies to the use of oxytocin for induction of labour. We have been using this drug for the induction and acceleration of labour since 1966 (Singh, *et al* 1980) without any harmful effect on the neonatals. The present study has been undertaken to confirm our clinical observations reported earlier and also to determine the probable role of oxytocin in neonatal jaundice. The findings have further encouraged us to continue routine use of oxtytocin in our obstetric practice. This facilitates to achieve the desired results in the shortest possible time (Panikh *et al* 1978) with safety, both to the mother and foetus.

Material and Methods

We have used oxytocin 1:250 to 1 in 50 concentration I.V. drip to induce and accelerate labour routinely since 1966 in 6216 pregnant women of different ages and parity, at term. All of them were thoroughly examined and assessed clinically for suitability of the procedure. Contraindications were also excluded. All the cases have to fulfil the criteria laid down by Singh *et al* (1980) for the procedure. The babies born after oxytocin were examined thoroughly and followed up. A comparative clinical study was also carried out with the babies born without the drug.

Serum bilirubin levels of 100 babies delivered with oxytocin and another 50 without oxytocin were estimated by indirect method. Hb% of these cases was also investigated by Sahlis method. For this purpose 0.8 to 1 ml of blood was collected, using all glass 2 ml. syringe and fine hypodermic baby needles No. 24, from the dorsal arch or anticubital vein within 72 hours of delivery. All the mothers had Hb% and serum bilirubin level investigated. They were carefully examined to exclude presence of any hepatic, toxic and other condition which might cause hyperbilirubinemia or jaundice. Age, height, weight, parity, B.P., duration of labour and type, nature of delivery, birth weight of the baby and the total amount of oxytocin administered

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were recorded in a proforma. Cases delivered without oxytocin during the same period were taken as control. All the datas were studied and statistically analysed.

Observations

We could further confirm from this study that oxytocin when used judiciously for induction and acceleration of labour is quite safe and could be used routinely (Panikh *et al* 1978; Singh *et al* 1980) if contraindications are excluded and cases selected carefully. The mean, S.D. and S.E. of bilirubin levels of the babies and mothers with oxytocin are shown in Table I and Table II for those of the controls. Highest recorded serum bilirubin level of the babies in this study was 8.5 mg% in a baby born to a primi aged 24, with 2 units of the drug. And, the lowest was 0.5 mg% with 5 units in a baby of another primi aged 19 years of age. The average age, parity, height, weight and Hb% of the mothers are shown in Table III. Statistical analysis reveals no relationship between these parameters and hyperbilirubinemia of the babies except with the height of the mothers. The Statistical 't' test between bilirubin levels of the babies of the two groups was also insignificant ($p < 0.05$) but for Hb of those two groups, it was found highly significant ($p < 0.001$). The correlation co-efficient between the bilirubin levels of the mothers and babies with oxytocin was 0.0892, and 't' test was insignificant ($p < 0.05$).

TABLE I

Serum Bilirubin Level of the Mothers and Babies Delivered with Oxytocin

Serum bilirubin	Mean	S.D.	S.E.
Babies	3.5634 (mg%)	1.51	0.19
Mothers	0.4033 (mg%)	0.16	0.02

TABLE II

Serum Bilirubin Level of the Mothers and Babies of Non-oxytocin Group (Control)

Serum bilirubin	Mean	S.D.	S.E.
Babies	3.3564 (mg%)	1.33	0.21
Mothers	0.4023 (mg%)	0.12	0.02

TABLE III

Some Parameters of the Mothers

Parameters	Range	Average
Age in Years	15-42	25.59
Height in Cm.	144-166	151.99
Weight in Kg.	44-64	51.15
Parity	0-8	1.48
Hb (gm%)	7.47-12.8	10.8

Results

From what we have observed in this study, we could conclude that oxytocin plays no role in hyperbilirubinemia when used for, induction or acceleration of labour. The mean serum bilirubin level of the oxytocin babies is 3.5634 mg% and that of non-ovytocin group is 3.3564 mg% showing a negligible difference of 0.217 mg%. The mean levels of the mothers are 0.4033 mg% and 0.4023 mg% respectively. But it is quite significant for Hb of the babies: the mean levels are 14.2978 Gm% and 13.8937 Gm% respectively, for the oxytocin and non-oxytocin groups. Except for the maternal height, other maternal parameters shows no appreciable change on the bilirubin levels of the babies. Correlation co-efficient 'r' between bilirubin levels of the babies and maternal height of both the groups are (+) 2.257223 and + 0.7853295 respectively; 't' test being significant ($P < 0.001$).

Discussion

Use of oxytocin to induce and accelerate labour is a highly standarised procedure. At term, the uterus is so sensitive

to oxytocin that reckless administration of the drug at the wrong time may cause tatanic contraction of the myometrium. Seithchik and Chatkoff (1975) concluded that the pathophysiology of hypocontractility involves a more or less progressive and excessive reduction in the rate of propagation and in the duration of contraction of individual elements during the pressure wave. Presumably, oxytocin acts by accelerating the rate of propagation, particularly at the beginning of the contractile cycle. At the cellular level, this action of oxytocin might be a reflection of the ability of the hormone to mobilise calcium from its bound form in the sarcoplasmic reticulus. Muscle with high level of mobile calcium pool is expected to contract faster and more intensely than muscle with less releasable pool. Further, oxytocin modulate marginally the 'shift', that occur in carbohydrate and liquid metabolism during labour (Kshyap *et al* 1976) showing a higher free fatty acid level in the maternal circulation of the spontaneous deliveries as compared to oxytocin induced labour. But how oxytocin might strengthen the weak contractile elements remains still obscure.

Oxytocin has been blamed for neonatal jaundice by earlier observers (Chalmers *et al* 1975; Oski, 1975; Calder *et al* 1974) but we could find no such indication in our present study. Earlier reports on hyperbilirubinemia linked with oxytocin might be an exaggerated observation. The high incidence of hyperbilirubinemia or neonatal jaundice in their study could be attributed to relatively traumatic methods of delivery (Friedsman and Sachtleben, 1976) associated with the artificial interruption of the pregnancy or, amniotomy (Calder *et al* 1974). Moreover, excessively strong uterine contractions induced by the drug, drive blood from the uteroplacental bed to the foetus. This leads to increase in the mass of red blood cells and could cause hyperbilirubinemia in some cases from normal destruction of orythrocytes. But oxytocin should not be linked with the condition. Thus we can conclude that use of oxtytocin for induction/acceleration of labour has no adverse effect to the foetus or, mother. This drug never betrays us causing neonatal jaundice.

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