EFFECT OF INTRAVENOUS FLUID ON DURATION OF LABOUR

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ABSTRACT

Background: Labour has challenging effects, on mother, with adequate hydration may have favorable effects. **Objective:** This study was carried out to determine the effect of intravenous fluids on the total duration of labour. **Patients and Methods:** This comparative cross sectional study was conducted in Obstetrics & Gynaecology department Unit-II, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan, from 1st April, 2013 to 30th September, 2013. A total of 63 women in true labour, gravida 2nd to 4th, age ≤ 35 years, gestational age of 37 to 40wks, Hb% ≥ 10g/dl with or without ruptured membranes were selected. These selected patients were randomly allocated in two groups. Group 1: oral fluid plus augmentation fluid. Group 2: Oral fluid plus intravenous fluid plus augmentation fluid. Confounders such as syntocinon dose and vomiting were controlled by stratification. Chi square test was used for comparing groups. Pearson correlation was used to corelate variables like duration of labour in hours and fluid intake in ml. Data was analyzed using SPSS version 16. **Results:** Mean age of the participants was 29 ± 2.8 years, mean number of kids was 2 ± 0.9, mean height in cm was 152 ± 2.07, mean Hb% in gm/dl was 10.18 ± 0.18, mean fluid in ml for augmentation was 284 ± 43 ml with median of 250ml, mean amount of fluid in ml was 1814 ± 1077 and a median of 1000ml. In fluid category of less than 2000ml, 42.9% have duration of labour <7 hours as compared to fluid category of >2000ml where 100% has duration of labour <7 hours (P < 0.05). It was noted that total fluid input was negatively corelated with duration of labour (r = 0.54) and it is significant at the 0.01 level. While controlling for syntocinon dose it was noted that increasing total amount of fluid intake of more than 2000ml has significant effect on reducing the duration of labour (P = 0.00). **Conclusion:** Our study showed that adding intravenous fluids and so increasing hydration of labouring women has reduced total duration of labour.

Keywords: Intra venous fluids, Duration of labour, Oxytocin

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INTRODUCTION

Labour is a metabolically challenging time for mother and fetus.[1] In a non diabetic women pregnancy have been shown to exhibit a state of "accelerated starvation", if denied food and dirnk.[1,2] Adequate hydration is logical for effective labour.[2,3] A policy of starvation in labour was introduced over 50 years ago in an order to prevent morbidity and mortality from pulmonary aspiration of gastric contents (Mendelson's syndorme) in those laboring women who required general anaesthesia.[4]

Different studies have addressed high volumes of intravenous fluids during labour that have positive effect on the progress of labour.[5] In absence of scientific evidence, advise to pregnant women is based on beliefs and poorly founded recommendations.[6] If the risk of aspiration is not significant then the question of whether oral fluid can achieve optimal hydration in labour become relevant.[6] Metabolic changes in late pregnancy pre-disposes to ketotic state and these changes are exacerebated by the physical demand of labour and delivery.[4,6] There is little evidence that light diet in labour reduces plasma markers of starvation while increasing plasma glucose. While eating causes a significant increase in volumes omitted and residual gastric volume around the time of delivery.[7] The habit of drinking large quantities of water has become quite common in general population and pregnant women are often advised large quantities in pregnancy and during labour. Abundant hydration during labour can cause severe and symptomatic hyponatreamia in mothers and infants.[8] The primary objective of this study was to determine whether giving laboring women high volume of intravenous fluids can reduce labour duration when oral fluid intake is unrestricted.

PATIENTS AND METHODS

This comparative cross-sectional study was conducted in Obstetrics & Gynaecology Unit-II of Sheikh Zayed Medical College/Hospital, Rahim Yar Khan, from 1st April, 2013 to 30th September, 2013. Selection of patients was done according to inclusion and exclusion criteria discussed below. A total of 63 women were selected. Patients were assigned in one of two groups randomly. During labour, women of both groups were allowed to drink freely but no

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solids were permitted. Group 1: Oral fluid plus augmentation of fluid (30 women). Group 2: Oral plus intravenous fluid plus augmentation fluid (33 women). Oral fluid included water, juice or carbonated soft drinks. Fluids were graduated in a one litter container. I/V fluids volume were given by infusion (16 drops / minute).

Inclusion criteria: Patients were considered eligible for inclusion if presented in first stage of labour (diagnosed as true labour), gravida second to fourth, age $\leq$ 35 years, gestational age of 37-40 weeks, Hb% $\geq$ 10g/dl, with or without ruptured membranes. Amniotomy, narcotic analgesia, oxytocin augmentation and other labour management decision were taken according to need.

Exclusion criteria: Primigravida, gravida 5 or more were excluded. Patients diagnosed with pre-eclampsia, chorio-amnionitis, pyelonephritis, maternal cardiac disease, renal disease, chronic liver disease or gestational diabetes mellitus were also excluded. Two groups i.e group I (oral + augmentation fluid) and group 2 (oral + augmentation + I/V fluids) were compared in terms of duration of labour. For purpose of analysis two fluid categories were taken i.e category I (Fluid intake of <2000 ml) and category 2 (fluid intake of > 2000ml) and compared in terms of duration of labour.

The data was entered and analyzed by SPSS version 16, and chi-square test was applied to compare two groups, whereas, pearson correlation was use to correlate duration of labour and fluid intake. P value of < 0.05 was taken as significant.

RESULTS

In this study a total of 63 pregnant women, who came to labour room of Sheikh Zayd Hospital for delivery were included. According to results mean age of the study subjects was 29 $\pm$ 2.8 years, mean number of kids was 2 $\pm$ 0.9, mean height in cm was 152 $\pm$ 2.07, mean Hb% in gm/dl was 10.18, mean fluid in ml for augmentation was 284 $\pm$ 43ml with median of 250ml, mean amount of fluid in ml was 1814 $\pm$ 1077. It was noted that 28.6% have one kid, 41.3% have two kids, 22.2% have three kids and 7.95% have four or above kids. Two fluid groups were taken. In category group 1 (oral fluids + augmentation fluid) 40.6% has duration of labour < 7 hours as compared to fluid group 2 (oral + augmentation fluid + I/V fluid) where 96.8% has duration of labour < 7 hours (P= < 0.05).

Our study further showed that adequate hydration seems to be an important factor for optimal labour progression. For the purpose of analysis two fluid categories were taken. In fluid categories of less than 2000ml) 42.9% have duration of labour < 7hours as compared to fluid category of > 2000 ml where 100% has duration of labour < 7 hours (P < 0.05). It was noted that total fluid input was negatively co-related with duration of labour (r = 0.54) and it is significant at the 0.01 level (2 tailed). Increase in syntocinon dose reduced total duration of labour(P $\leq$ 0.01). While controlling for syntocinon dose it was noted that increasing total amount of fluid intake of more than 2000ml has significant effect on reducing the duration of labour. (P = 0.00). In our study, it was noted that in patients who have vomiting, 43.5% have duration of laobur <7 hours as compared to 82.5% in patients having no vomiting (P = 0.001).

DISCUSSION

The duration of labour equals a marathon for many women, hence the importance of careful administration of fluids. Many authors consider 150-200ml / hr safe to drink during labour but with simultaneous intravenous administration.[4] Recent trials using intravenous lactated ringer's solution at the rate of 250 ml/hour have shown outcomes associated with a shorter duration of labour suggesting that increase hydration may improve uterine function. In one study of 195 women in California, the frequency of labour lasting more than 12 hours was less in a group of nulliperous women, receiving 250 ml/hour than in a group receiving 125ml / hour. The average length of labour in this study was more than 500 minutes.[8] Another study on 300 women performed in Iran showed a significantly shorter duration of labour in a 250ml/hour treatment group compared to a 125ml/hour group (253 versus 386 minutes) as well as a lower frequency of oxytocin administration (8% versus 20%).[9]

While another study done on in 80 women by Andrew coco and others, in department of family medicine and department of obstetrics and gynaecology, Lancestir general hospital, concluded that increased intraveous hydration does not decrease labour duration in nulliparous women where access

to oral fluid was unrestricted.[10] In 80 women 37 in I/V fluid group and 43 in usual case group. There was no difference in primary outcome of total duration of labour (9.5 versus to 9.4 hours) or in secondary outcome of duration of the first stage (7.9 versus to 8 hours), duration of second stage (1.6 versus to 1.4 hours) or rate of oxytocin augmentation (51 versus 44 %).[11] Two other studies supported the view that adequate hydration shorten duration of labour. First was done by Garete et al, in which randomly 195 women received either 125ml or 250ml / hour of I/V fluids. Women in 125ml group had a higher percentage of total labour duration greater than 12hours (26% in 125ml group versus 13% in 250ml group).[12] Interestingly the author also noted that in their previous clinical experience, moms who receive only 125ml/hour of I/V fluids seems thirsty and dehydrated. Second study was done by Eslamian et al, who randomized 300 first time moms to receive either 125 or 250ml / hour. The first stage of labour and the total duration of labour were significantly shorter in the 250ml group. Prolonged labour (greater than 15 hours) was more common in the 125ml group and 125 ml group was more likely to have oxytocin augmentation for slow labour.[13] Chantry et al followed 448 pregnant patients. According to this study among women who have unrestricted access to oral fluids, I/V hydration during labour offers only one advantage i.e. it may reduce the incidence of nausea / vomiting. It did not have any other benefits. It did not shorten the length of labour.[14]

Our study further clarifies the importance of maternal hydration in labour. Here women allowed to drink freely, self regulate their volume status and can maintain adequate hydration as well as women receiving 250ml / hour of I/V fluid, rendering higher rates of I/V fluids un-necessary. Self regulating intake has important emotional benefits for laboring women, it has been shown to decrease stress while providing a feeling of control. While the administration of I/V fluids at 250ml/hour did not cause any complications in this or prior studies, there is at least a theoretical risk of fluid over load in both mother and baby,[10] with attendant complications of pulmonary edema and hyponatremia in the mother and decreased umbilical artery PH and transient respiratory distress in newborn. Pulmonary aspiration can be avoided, even in the presence of oral intake, with properly trained obstetric anesthesia personnel.[9,10]

CONCLUSION

Our study showed that adding intravenous fluids and so increasing hydration of laboring women has reduced total duration of labour.

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