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Labour Progress and Outcome in Primiparous Women on Three Regimens of Hydration during the Active Labour

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Abstract
Aim: *This study aimed to evaluate the labour progress and outcome in primiparous women on three regimens of hydration during the active labour.*
Methods: *A quasi-experimental research design was used to carry out this study at the Labour and Delivery unit, Mansoura University Hospital, Egypt. This study comprised 120 primiparous women in spontaneous active labour, at a cervical dilation of 4-5 cm, and uncomplicated with cardiac or renal disease. Upon the Obstetrician discretion, each eligible parturient was assigned to one of three groups; the first group received no intravenous fluid, while the second and third groups received Ringer's lactate at a rate of 125 or 250 ml/hour respectively. Labour progress of the enrolled parturients was exclusively monitored by the nursing researcher. Using two tools, data were collected. The 1st was a structured interviewing questionnaire schedule to include the parturients' basic characteristics and the labour outcome and the 2nd was the partograph to evaluate the labour progression.*
Results: *After 6 hours from infusion, the cervix was significantly more dilated in group 3 than group 1 and 2 (9.6 ±0.5, 7.9 ±1.2 and 8.8 ±1 cm respectively, p<0.001). Group 3 compared to group 1, 2 shows more frequent uterine contractions (3.8 ±0.8, 1.5 ±0.5 and 2.5 ±0.5 respectively; p<0.001), and had significantly longer uterine contraction during the active deceleration phase (52.8 ±4.9, 27.7 ±1.7 and 34.3 ±3.2 seconds respectively, p<0.001). Also, 75% of the fetuses in group 3 were at +2 station compared to 14.3% and 27.8% only in group 1 and 2 respectively (p<0.001).*
Conclusion and recommendation: *Given the conclusion that the lower level of hydration is combined with a longer first stage of labour, less frequent/shorter duration uterine contractions, and slower fetal descent; it is recommended for the perinatal nurses to closely monitor the parturients who are on a lower level of fluid therapy throughout the active phase of labour.*
Keywords: *Labour progress, primiparous, and hydration*.

I. Introduction

Labour progress has been recognized by the changes in uterine contractions, cervical dilation, and head descent. It is affected by many factors one of these is the maternal hydration. Exercise physiologists indicates that adequate hydration boosts muscle performance in long distance joggers and a reasonable resemblance could be made to uterine contractions in parturient women with prolonged labours [1]. Therefore, it is logical that keeping the parturient woman well hydrated contributes to an effective labour, where adequate maternal hydration is imperative for fetal oxygenation, transport of nutrients, and gets rid of wastes from the contracting myometrium during the labour course [2-4].

It has been stated by a recognized maternity educator, "The maintenance of hydration throughout labor is essential for the woman's well-being [5]." However, ideal hydration for intrapartum period has never been described. Not long, maternal hydration during labour has been the focus of research studies. In an Iranian prospective randomized study, three hundred primiparous women in their active phase of labour assigned to receive one of two regimens of intravenous fluid (IV). This study finding indicated that increased IV fluid is associated with significantly shorter labor duration and lower rate of prolonged labor and oxytocin augmentation. In this respect the investigators concluded that adequate IV hydration may avert necessitate cesarean deliveries that are indicated exclusively for labor dystocia as a result of dehydration [6].

Other studies have been reported that adequate maternal hydration is associated with a shorter length of labour, a lower rate of oxytocin augmentation and a decrease in cesarean section need, and poorly hydrated women are at risk of dysfunctional labour and operative deliveries [7, 8]. Yet, in a randomized trial conducted on eighty primiparous women allocated in one of two groups; the first group kept on IV fluid at a rate of 250 mL/hour, while the second group received IV fluid when obstetrically indicated, such study finding reported that increased IV hydration did not reduce the duration of labour or the frequency of oxytocin augmentation [9].

1.1 Significance of the study

In Egypt, the overall rate of cesarean delivery was 47.3% in 2010. In a recent study conducted at Mansoura University Hospital; a tertiary teaching hospital in the delta region in Egypt, the cesarean section rate was significantly increased from 42.7% in 2006 to 55.3% in 2010, with a 10.4% performed due to dysfunctional labour [10, 11]. Maternal hydration as a one of the contributing factors for dysfunctional labor is minimally investigated in Egypt. Thus, the present study aims to evaluate the labour progress and outcome in primiparous women on three regimens of hydration during the active labour.

1.2 Aim of this study

This study aims to evaluate the labour progress and outcome in primiparous women on three regimens of hydration during the active labour.

1.3 Research hypothesis

To fulfill the aim of this study, two hypotheses were tested.

Hypothesis 1: "Parturient primiparous women who receive a higher level of hydration during their active labour go through a faster progress than those on a lower level".

Hypothesis 2: "Parturient primiparous women who receive a higher level of hydration during their active labour require less Oxytocin augmentation than those on a lower level".

II. Subjects and Methods

2.1 Research design

This study was designed as a quasi-experimental research design.

2.2 Study setting

The present study was conducted at the Labour and Delivery unit of Obstetrics and Gynecology department, Mansoura University Hospital, Egypt.

2.3 Sampling

2.3.1 Inclusion criteria

A purposive sample of parturient women who had attended the study setting from July to December 2013 was recruited if they fulfilled the following inclusion criteria:

1. Age from 20 to 35 years.
2. At a gestation period between 37 to 40 weeks.
3. Primiparous with a singleton live fetus in vertex presentation.
4. In spontaneous active labour with a cervical dilation of 4-5 cm and with intact fetal membranes.
5. Healthy parturients; uncomplicated with cardiac and/or renal disease, and not diagnosed as cephalopelvic disproportion.

2.3.2 Sample size

The target variable in this study is the cervical dilatation. If the clinically relevant difference in the cervical dilatation between the groups is presumed to be 1.6 points and the standard deviation 2; and if two-sided significance level of 0.05 (or 5%) is to be used and the power should be 0.8 (or 80%) then by substitution of these data in the sample size formula of $n = 2(Z_{\alpha/2} + Z_{\beta})^2 \sigma^2 / \Delta^2$. Where: n= the number of patients in the study, Zα/2= this is the value of the normal distribution which cuts off an upper tail probability of α/2. (If α=0.05 thenZα/2=1.96), Zβ= this is the value of the normal distribution which cuts off an upper tail probability of β. (if β =0.2, then Zβ =0.84). σ= the presumed standard deviation of the outcome, Δ= the difference sought between the means of the two groups. Then, we have: 2(2)2(1.96+0.84)2/ (1.6)2=39.2. Hence, 40 participants per treatment arm are required; with a total sample of 120 parturients.

2.3.3 Recruitment and group's assignment

On admission and after full clinical and obstetrical assessment, eligible parturients were recruited. Upon the Obstetrician on duty discretion, each one was assigned to one of three groups according to their attendance to the labour and delivery room; the first group received no intravenous fluid, while the second and third groups received Ringer's lactate at a rate of 125 or 250 ml/hour respectively.

2.4 Tools of data collection

To attain the aim of this study, two tools were used for data collection. These involved a structured interviewing questionnaire schedule and the partograph.

Tool I: A structured interviewing questionnaire schedule

It was developed and used by the researchers. It consists of three parts; to present the sociodemographic data in terms of age, occupation and level of education in the first part. Obstetric history and initial assessment data in the second part including, general assessment finding such as vital signs, body weight, height, and findings of spot urine protein and acetone, abdominal examination finding (i.e. fundal level, fetal presentation, and fetal position, auscultation to the fetal heart rate) and vaginal examination finding (i.e. cervical dilation, effacement, position, consistency, and station of the presenting part) with pass on the total Bishop score at the time of admission. Outcome of labour was presented in the third part to refer to the need for Oxytocin infusion, mode of delivery and Apgar scores at the 1^{st} and 5^{th} postpartum minutes.

Tool II: Partograph

Partograph is a standardized tool designed by the World Health Organization as a single sheet. It aims at presenting a continuous illustrative overview on the labour events, identifying a deviated course, and thus leads the maternity staff to intervene within a reasonable time to prevent prolonged labour [12]. It is alienated into three sections; fetal condition, labour progress, and maternal condition. Fetal condition presents the upper section and entails data about the fetal heart rates/30 minutes, similarly clarity of liquor and moulding of the sagittal suture. Labour progress is the middle section; it gives illustrative overview on the labour course through a continuous report of cervical dilation, head descent, duration and frequency of uterine contractions /10 minutes. Maternal condition is the lower section which demonstrates the medicines and the given IV fluids; in terms of name, dose/amount and route of administration, as well as the maternal vital signs, and the findings of urine investigation for protein and acetone and the output volume were included in the same section.

2.5 Validity of the developed tool

Validity of the structured interviewing questionnaire schedule was attained by a panel of three experts in maternity nursing specialty and the considered necessary modifications were carried out.

2.6 Ethical considerations

An official approval was obtained from the head of obstetrics and gynecology department of Mansoura University Hospital. As well as, ethical approval was granted from the Ethics Committee of the Nursing Faculty. Additionally, all enrolled parturients gave their informed consents before enrollment.

2.7 Pilot study

A pilot study was conducted on twelve parturient women who were excluded from the study sample. It aimed at testing the clarity and completeness of the developed tool. Result of the pilot indicated that the statements of the tools were clear and comprehensive.

2.8 Research process

The investigators attended the labor and delivery unit twice weekly for six months. The required data were collected through four phases. Initial assessment and groups assignment was the first phase and it was entirely performed by the Obstetrician on duty, while the other three phases specifically; implementation, follow-up, and outcome evaluation were completely performed by the nursing investigator.

2.8.1 Initial assessment phase

On admission, each woman was interviewed and history has been taken. Initial assessment was done to collect the baseline data and confirm eligibility for participation. Then, the study aim was clarified, informed consent was taken and each eligible woman was allocated to one of three groups. This phase took about 10-15 minutes to be completed.

2.8.2 Implementation phase

This phase involved providing the participants with the assigned regimen of hydration and accurately recording the IV fluid that was dispensed during the active phase of labour. It was exclusively done by the nursing investigator. By the beginning of the active phase (from 4-10 cm cervical dilation), group one was on sips of water or ice chips according to the American College of Nurse-Midwives guidelines [13] and had not received IV fluid unless Oxytocin augmentation is required; thus, served as a control group. Yet, groups two and three received IV Ringer's lactate at a rate of 125ml/hour or 250ml/hour respectively.

The drip rate for the second and third groups was calculated according to the following formula: Drops/minute= Fluid volume (ml)/hour divided by 60 min/hour x drop factor. Thus, using 15 as the drop factor for the used solution to substitute in the above formula; group 2 received 31 drops/min, while group 3 received 62 drops/min of Ringer's lactate.

2.8.3 Follow-up phase

This phase entails monitoring the labour progress and documenting the active phase events in the partograph sheet. Vaginal examination findings documented according to the hospital's protocol for primiparous (i.e. every two hours). Uterine contractions were evaluated for both frequency/10 minutes and duration and illustrated hourly in the partograph.

Intact fetal membranes was one of the inclusive criteria of the study subjects, but if not ruptured spontaneously until 5cm cervical dilation, the Obstetrician on duty, had to rupture it artificially according to the setting protocol to enhance labour progression. However, if the parturient woman did not had adequate efficient uterine contractions (3/10 minutes that last >45seconds), and/or cervical dilation of 1 cm/hour after one hour of amniotomy, failure to progress is expected and Oxytocin augmentation was commenced according to the setting protocol for primiparous woman (5 IU diluted in 500ml Ringer's lactate). In this case, the need for Oxytocin augmentation was documented as a labour outcome.

2.8.4 Outcome evaluation phase

By the end of the active phase partograph sheets were reviewed. Duration of the active phase was determined as the time period needed to reach full cervical dilation from 4cm; uterine contractions frequency and duration were evaluated during the active acceleration phase (4-7cm cervical dilation) and active deceleration phase (8-10cm). Station of the fetal head was assessed every two hours, need for oxytocin augmentation and Apgar score at the 1^{st} and 5^{th} minutes postpartum all were recorded for each group for statistical analysis. After delivery of the baby, mode of delivery, duration of the second stage (i.e. from 10cm cervical dilation to delivery of the bay), and duration of the third stage (i.e. from delivery of the baby until delivery of the placenta) were determined.

2.9 Limitation of the study

Unavailability of infusion pumps at the labour and delivery unit act as a limitation in this study, where it led the nursing investigator to waste a long time to adjust the drip rate, especially when the IV tubing has to be removed and reinserted for any indication.

2.10 Data analysis

The statistical analysis of data was done by using SPSS program (statistical package for social science) version 20.0. The quantitative data were expressed as range and mean ±standard deviation (SD) while qualitative data were expressed in number and percent. For quantitative data one way ANOVA test was used to compare among the groups while for qualitative data, Chi- square test was used to compare among the groups. Statistical significant difference was considered at $P<0.05$, and highly significant difference at $P<0.001$.

III. Results

3.1. Basic characteristics of the participants on the three regimens of hydration

Table 1 shows the basic characteristics of the participants on the three regimens of hydration. It is clear from this table that the three groups were matched as regards the maternal age, BMI, gestational age, the total water intake, Bishop score at admission as well as the newborn birth weight and gender ($p >0.05$).

3.2. Labour Progress of the participants on the three regimens of hydration

The cervical dilatation at two, four, and six hours from enrollment was significantly wider in the 3^{rd} group than that of the 1^{st} and of the 2^{nd} groups. At 2 hours the cervical dilations were (7 ±0.8, 4.8 ±0.7 and 5.5 ±0.6 cm respectively), at 4 hours were (8.6 ±1.2, 6.6 ±1.1, 7.3 ±1.1 cm respectively), and were (9.6 ±0.5, 7.9 ±1.2 and 8.8 ±1 cm respectively) at 6 hours. Differences observed were statistically significant with a p value <0.001**(Table 2)**.

As regards the fetal head descent, the same table reveals that fetuses of group 3 were faster to pass the ischial spines; where 5 (12.5%) were at +1 station at 2 hours of enrollment compared to none in the other two groups ($p=0.009$), while at 4 hours 12 (33.3%) of group 3 fetuses were at +2 station compared to 3 (7.9%) in group 2 and none in group 1 ($p<0.001$). Moreover, at 6 hours 12/16 (75%) of group 3 fetuses were at +2 station compared to 5/18 (27.8%) and 3/21 (14.3%) only in group 2 and 1 respectively ($p<0.001$) **(Table 2)**.

Concerning the uterine contractions, during the active acceleration phase, the uterine contractions/10 minutes in group 3 were more frequent than in group 1 and 2 (2.6 ±0.5, 1.5 ±0.5 and 1.5 ±0.5 respectively; p<0.001). Similarly, during the active deceleration phase, they were more frequent in group 3 than in group 1 and 2 (3.8 ±0.8, 1.5 ±0.5 and 2.5 ±0.5 contractions/10 minutes respectively; p<0.001). The duration of uterine contraction during the active acceleration phase was significantly longer in group 3 than in group 1 and 2 (37.8 ±3.8, 12.4 ±4.7 and 27.6 ±1.7 seconds respectively; p<0.001). Similarly, it was significantly longer in group 3 than in group 1 and 2 during the active deceleration phase (52.8 ±4.9, 27.7 ±1.7 and 34.3 ±3.2 seconds respectively; p<0.001) **(Table 3)**.

As shown in **Figure 1**, the duration of the active phase of labor was significantly shorter in group 3 than in group 1 and 2 (284 ±54.4, 368.2 ±74.7 and 313 ±47.4 minutes respectively, p<0.001) and similarly, the duration of the second stage of labor was significantly shorter in group 3 than in group 1 and 2 (54 ±15.1, 65.5 ±14 and 56.2 ±16.7 minutes respectively, p=0.002). Meanwhile, the duration of the third stage of labor did not differ significantly among the three groups (p=0.098). However, the total duration of labor was significantly shorter in group 3 compared to groups 1 and 2 (345 ±54, 439.7 ±54 and 375.1 ±42 minutes respectively, p<0.001).

3.3. Labour outcomes of the participants on the three regimens of hydration

The need for oxytocin augmentation was more frequent among the parturients in group 1 than in groups 2 and 3 (42.5%, 32.4% and 15% respectively, p=0.025). However, mode of delivery, indications for CS and Apgar score of the newborns at 1st and 5th minutes did not differ significantly among the three groups (p>0.05) **(Table 4)**.

Table (1): Basic characteristics of the participants on the three regimens of hydration

Characteristics	Group 1 (n=40) (control)	Group 2 (n=40) (125ml/hour)	Group 3 (n=40) (250ml/hour)	ANOVA test	
	Mean ±SD	Mean ±SD	Mean ±SD	F	P
Maternal age (years)	28.8 ±4.6	27.2 ±4.9	26.6 ±4.4	2.348	0.100
BMI	27.3 ±2.2	26.6 ±2.2	26.7 ±2.4	0.824	0.441
Gestational age (weeks)	38.3 ±1.1	38.4 ±1.1	38.7 ±1.3	1.209	0.302
Bishop score on admission	8.1 ±0.8	8 ±0.9	8.2 ±0.8	1.143	0.323
Newborn weight	3177.8±149.2	3166.5 ±134.2	3154.5 ±158	0.249	0.780
Newborn gender (n, %)					
Female	16 (40%)	18 (45%)	17 (42.5%)	0.205*	0.903
Male	24 (60%)	22 (55%)	23 (57.5%)		
** x^2, chi square test*					

Table (2): Cervical dilatation and head descent of the participants on the three regimens of hydration

Variables	Group 1 (control)	Group 2 (125ml/hour)	Group 3 (250ml/hour)	ANOVA test	
	Mean ±SD	Mean ±SD	Mean ±SD	F	P
Cervical dilatation (cm) after commencing IV infusion by:					
2 hours					
Mean ±SD	4.8 ±0.7	5.5 ±0.6	7 ±0.8	103.2	<0.001
Range	4-6	5-7	6-8		
4 hours					
Mean ±SD	6.6 ±1.1	7.3 ±1.1	8.6 ±1.2	43.989	<0.001
Range	5-8	6-9	7-10		
6 hours					
Mean ±SD	7.9 ±1.2	8.8 ±1	9.6 ±0.5	33.544	<0.001
Range	6-10	7-10	9-10		
Fetal head descent (station) after commencing IV infusion by:					
2 hours					
-1	23 (57.5%)	21 (52.5%)	13 (32.5%)	13.603	0.009
0	17 (42.5%)	19 (47.5%)	22 (55%)		
+1	0 (0.0%)	0 (0.0%)	5 (12.5%)		
4 hours					
0	21 (53.8%)	18 (47.4%)	8 (22.2%)	21.892	<0.001
+1	18 (46.2%)	17 (44.7%)	16 (44.4%)		
+2	0 (0.0%)	3 (7.9%)	12 (33.3%)		
6 hours	**no=21**	**no=18**	**no=16**		
0	5 (23.8%)	1 (5.5%)	0 (0.00%)	18.502	<0.001
+1	13 (61.9%)	12 (66.7%)	4 (25%)		
+2	3 (14.3%)	5 (27.8%)	12 (75%)		

Table (3): Uterine contraction characteristics of the participants on the three regimens of hydration					
Variables	**Group 1 (control)**	**Group 2 (125ml/hour)**	**Group 3 (250ml/hour)**	**ANOVA test**	
	Mean ±SD	**Mean ±SD**	**Mean ±SD**	**F**	**P**
Frequency of uterine contractions/10 minutes					
During the active acceleration phase (4-7 cm)					
Mean ±SD	1.5 ±0.5	1.5 ±0.5	2.6 ±0.5	69.233	<0.001
Range	1 – 2	1 – 2	2 – 3		
During the active deceleration phase (8-10 cm)					
Mean ±SD	1.5 ±0.5	2.5 ±0.5	3.8 ±0.8	130.714	<0.001
Range	1 – 2	2 – 3	3 – 5		
Duration of uterine contractions					
During the active acceleration phase (4-7 cm)					
Mean ±SD	12.4 ±4.7	27.6 ±1.7	37.8 ±3.8	490.830	<0.001
Range	5 – 20	25 – 30	30 – 45		
During the active deceleration phase (8-10 cm)					
Mean ±SD	27.7 ±1.7	34.3 ±3.2	52.8 ±4.9	554.827	<0.001
Range	25 – 30	30 – 40	45 – 60		

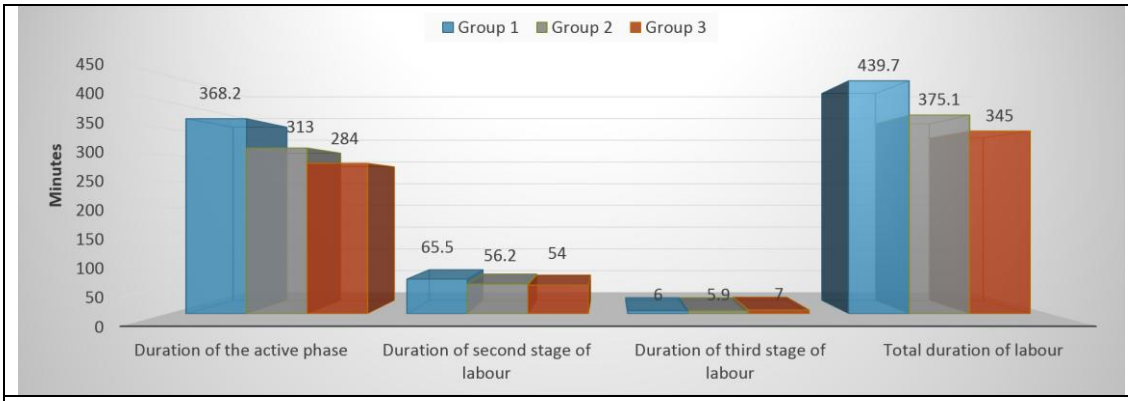

Figure 1. Comparison between the duration of labour among the three studied groups

Table (4): Labour outcomes of the participants on the three regimens of hydration					
Outcomes	**Group 1 (n=40) (control)**	**Group 2 (n=40) (125ml/hour)**	**Group 3 (n=40) (250ml/hour)**	**ANOVA test**	
	Mean ±SD	**Mean ±SD**	**Mean ±SD**	**F**	**P**
Need for oxytocin	17 (42.5%)	13 (32.5%)	6 (15%)	7.381*	0.025
Mode of delivery					
SVD	29 (72.5%)	31 (77.5%)	33 (82.5%)	1.147*	0.564
CS	11 (27.5%)	9 (22.5%)	7 (17.5%)		
Indications for CS					
Fetal distress	7 (17.5%)	8 (20%)	7 (17.5%)	4.24*	0.120
Failure to progress	4 (10%)	1 (2.5%)	0 (0%)	4.24*	0.120
Apgar score					
1st minute	6.8 ±0.8	6.7 ±0.8	6.9 ±0.9	0.605	0.548
5th minute	8.5 ±0.0	8.4 ±1.3	8.4 ±1.2	0.083	0.920

** chi square test, **SVD;** Spontaneous vaginal delivery*

IV. Discussion

The aim of this study was to evaluate the labour progress and outcome in primiparous women on three regimens of hydration during the active labour. This aim was achieved through the present study finding which revealed that the third group reported statistically significant more frequent and longer uterine contractions beside faster head descent and cervical dilation compared to the other two groups. Accordingly, the study hypothesis is accepted, "parturient primiparous women who receive a higher level of hydration during their active labour go through a faster progress than those on a lower level".

The present study finding concomitant with that of an **Egyptian** study investigated the effect of increased intravenous hydration on labour progress [8]. It was conducted at two hospitals; namely, Benha University Hospital and El-Mahala General Hospital on one hundred fifty parturient nulliparous women in their active

phase of labour. They were randomly assigned to one of three groups; group one received Ringer's lactate IV at a rate of 250ml/hour, group two received the same fluid at a rate of 125ml/hour, while the third group served as a control group.

Such study finding reported a statistically significant higher percentage of frequent uterine contractions as 3/10 minutes (46%, 22%, and 12%; p=0.001), and a longer duration of uterine contractions (38.44, 36.32, 35.15 seconds; p=0.001) in the first group subjects compared to the second and third groups respectively. Moreover, the fetal head descent and cervical dilation were significantly faster in the first group than in the second and third groups, where 10% of women in the first group reached +1 station within two hours from the active phase compared to none in the other two groups, additionally the subjects of the first group took a shorter time to reach the full cervical dilation than those of the second and third groups (292.50, 310.33, 329.56 minutes respectively; p=0.01). Such finding may be explained by the notion that adequate hydration enhances the muscles performance; including uterine smooth muscles which are involved in the labour process and giving rise to adequate efficient uterine contraction with subsequent proper progress of cervical dilation and descent of the presenting part [6].

Duration of labour was determined for the current study subjects. It showed a significant shorter active phase and so total duration of labour in the third group compared to the first and second groups. This finding agrees with that of Direkvand-Moghadam et al, 2012 [14] who had investigated the effect of intravenous hydration on the length of active labour in 120 **Iranian** nulliparas. Subjects were assigned randomly to one of four groups, group 1 received no intravenous fluid, and groups 2, 3, and 4 received Ringer's lactate solution at a rate of 60 ml/hour, 120ml/hour, or 240ml/hour respectively beside that all were allowed to drink water or soft drinks at will. The investigators reported significant differences in the extent of the active phase (252.3±40.9 minutes in group 1 vs. 206.7±38.3 minutes in group 4; P<0.001) and for the duration of second stage (64.3±13.9 minutes in group 1 vs. 49.8±11.4 minutes in group 4; P=0.01), compared to insignificant differences for the third stage (6.9±3.6 minutes in group 1 vs. 5.7±2.7 minutes in group 4; p=0.58) [14].

Similarly, in a very recent comparative cross sectional study conducted in **Pakistan** [15] on 63 parturient women during their active phase of labour in their 2^{nd} to 4^{th} pregnancy, they were allotted in two groups. One group received oral fluid plus augmentation fluid, similarly the second group but with extra intravenous fluid. By the end of the active phase, the authors dichotomized the subjects of both groups into two categories based on the calculated total fluid intake and reported that 42.9% have a duration of labour less than seven hours among the subjects who received less than 2000 ml fluid during the active phase compared to 100% among those who received more than 2000 ml fluid (p<0.05), and they had concluded that enhancing hydration of parturients resulting in a decreased total duration of labour. The same conclusion has been given by other studies [7, 8].

In contrast Kavitha et al, 2012 [16] observed insignificant difference in the duration of labour (391, 363, 343 respectively; p=0.20) in a randomized clinical trial conducted in south **India** on 293 uncomplicated, term primigravida, allocated to three groups. The first group (n=99) acted as a control group, the second and third groups received Ringer's lactate at a rate of 125ml/hour or 250ml/hour respectively and all groups were allowed to drink at will plain or coconut water. Also Coco et al, 2010 did not find a difference in the duration of labour with increased intravenous hydration when oral fluid was unrestricted [9]. Coco and colleagues believed that when parturient women are allowed to drink at will they can self regulate their fluid volume as well as maintaining adequate hydration similar as if receiving 250ml/hour. This believes was not supported by others who had stated that IV fluid at a rate of 125ml/hour is indicated for those at rest and not enough for parturient women [6].

According to the present study setting protocol, prolonged labour augmented by oxytocin. It was more common in group 1. Accordingly, hypothesis 2 is accepted; "parturient primiparous women who receive a higher level of hydration during their active labour require less Oxytocin augmentation than those on a lower level". This finding is consistent with that of Direkvand-Moghadam [14] who reported a significant difference between the previously described four study groups as regards oxytocin need (53.3%, 40%, 23, 20% respectively; p=0.02). In the same line, another report [7] indicated a significant difference (4.8% vs. 6.25% respectively; p=0.002) for the need to oxytocin infusion between two groups; the first group (n=82) received 250 ml/hour saline solution in dextrose water and the second group (n=112) received the same solution at a rate of 125ml/hour. The significant decrease for oxytocin need in the greater IV fluid intake group may be explained by; that the aim of infusing oxytocin is to attain adequate efficient uterine contraction which is achieved by the greater fluid intake; resulting in a significant decrease to the need for augmentation [6].

In the present study mode of delivery and Apgar scores at the 1^{st} and 5^{th} postpartum minutes did not differ significantly among the three groups, and other studies reported the same finding [9, 16]. Yet, another study reported a significant decrease in the group of the greater fluid intake for the frequency of cesarean section delivery [6]. These differences in the findings may be related to the differences in the protocols used for managing the cases of prolonged labour.

5. Implication for practice

Although intrapartum fluid infusion is based on Obstetrician discretion, it is still mainly within the territory of nursing practice. Evidence-based recommendations on ideal hydration through the intrapartum period are still lacking. In the absence of reliable research evidence for the ideal management of intrapartum hydration, no hospital practice is valid. This leaves maternity staff with the responsibility of deciding what they are believed is the best management.

V. Conclusions

Based on the study findings, it was concluded that

1. Lower level of hydration is combined with a longer first stage of labour, less frequent and shorter duration of uterine contractions, and slower fetal descent.
2. Providing the parturient primiparous women with a adequate hydration is combined with a shorter active phase of labour.

VI. Recommendations

Based on the conclusion of the present study finding, the following are recommended:

1. For the perinatal nurses, to closely monitor the parturients who are on a lower level of fluid therapy throughout the active phase of labour.
2. For the Obstetricians, to keep parturients well hydrated to enhance labour progression.
3. Future research to explore the upper safe level for intrapartum hydration is recommended.

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