

The Effect Of intravenous Fluids infusion on The Progress of Labour And Newborn Outcome

Halaabd El Fattah Ali¹, Rehab Abd El Aziz El Sayedabd El Aziz²

¹ Assistant Professor of Woman Health and Maternity Nursing, Faculty of Nursing Kafrelsheikh University, Egypt.

² lecturer of Pediatric Nursing, Faculty of Nursing, Mansoura University, Egypt.

Corresponding Author: Halaabd El Fattah Ali

Abstract: Intravenous fluids instead of oral hydration is universal practice in labour. Sufficient rehydration has shown a lessening in labour duration and improve newborn outcome. However results of other studies anticipated that labour duration could be decreased by administering IV fluids at a rate of 120 ml/hr. **Aim:** Thus, the aim of the current study was to assess the effect of intravenous fluids infusion on the progress of labour and newborn outcome. **Design:** A descriptive correlation design. **Setting:** The study was conducted at the delivery room and postpartum outpatient clinic in General Hospital, Kafrelsheikh, Egypt. **Sample:** A convenient sample of 150 labouring women (divided to 50 each group) was selected. **Tools:** Maternal assessment tool, maternal fluid balance chart, Apgar score tool and newborn follow up sheet were used to collect the data. **Results:** The current study revealed that the duration of the active phase in the 1st stage of labour was significantly shorter in the glucose alternating with saline group than in the normal saline alone group and the glucose alone group (226.9 ±63.6, 309.9 ±69.7 and 370.3 ±71.8 minutes respectively, p<0.001). Similarly, The duration of the 2nd stage of labour in the glucose alternating with saline group was 85.1 ±42.0 minutes while the duration were longer in the glucose alone group (95.1 ±38.0 minutes) and the normal saline alone group (116.7 ±44.3 minutes). These differences were significant (p<0.001). The newborn weight did not differ significantly by the fluid received. Additionally, majority 92% of the newborns in glucose alternating with saline group were started breast feeding within 1 hour after delivery compared to about three quarter 76% and 74% of the newborns in normal saline alone and glucose alone groups respectively. Also, Apgar score at 1 and 5 minutes after birth, were significantly greater in the glucose alternating with saline group than in the normal saline alone and the glucose alone groups. These differences were significant (p<0.05 & p<0.001). **Conclusion:** A significant difference between time of active phase and type of fluid received through labour and enhances the newborns Apgar score and initiate of breast feeding early. The newborn weight did not differ significantly by the fluid received. **Recommendation:** Further studies with larger sample sizes, more outcome and different IV fluids concentration is required to determine the exact effect of them.

Keywords: Intravenous Fluids; Labour Progress; Newborn outcome.

Date of Submission: 29-06-2018

Date of acceptance: 17-07-2018

I. Introduction

All through labour, it is standard for to have no or little sustenance confirmation, paying little mind to the way that the demand of imperativeness increases in view of skeletal and smooth muscle narrowing [1]. Myometrial contractility is one of the different factors affecting the progress of labour. As tasteful hydration improves the muscle execution in postponed labour can be considered as a drawn out exercise, adequate fluid association may upgrade the labour progress [2]. Glucose or saline or glucose and saline together are the principal substrate for pregnant uterus. Adequate resource of glucose or saline is required to keep up training protection and muscle profitability and decrease the duration of active labour and improve the labour progress, in light of the fact that these are fundamental factors in the progress of human labour and parturition. Thusly, it can be suggested that broken or deferred labour strategy, a fundamental sign for basic cesarean movement, could at any rate to a constrained degree be raised from lacking uterine forces or uncalled for made withdrawals in see out of deficient openness of the substrate [3]. Garite et al. exhibited that by expanding the rate of maternal hydration, a decrease in recurrence of delayed labour could be accomplished, and perhaps there will be a lesser requirement for oxytocin and cesarean conveyance [4]. Eslamian et al. affirmed the impact of expanded parenteral hydration on diminishing the term of labour [5]. This labour was trailed by Shrivastava et al. who exhibited that parenteral organization of dextrose and saline arrangement was related with abbreviated labour course in term vaginally conveyed nulliparous in unconstrained labour [6]. Dappuzzo-Argiriou et al. shown that the utilization of intravenous fluids containing 5% dextrose and saline 0.9% at a rate of 120/min did not bring

down the shot of cesarean conveyance for conceded in dynamic labour [7]. Fong et al. exhibited that neither rate of conveyance nor dextrose or saline organization in intravenous liquid changed the labour length or conveyance results in nulliparous who were introduced in dynamic labour [8]. Organization of a dextrose arrangement, paying little mind to focus, was related with an abbreviated labour course in term vaginally conveyed nulliparous subjects in dynamic labour [9].

Fluids over-burden is one clinical factor that influences the mother, as well as the newborn too. A newborn may show up enlarged when the mother gets abundance intravenous liquid, the proposed supporter of newborn weight reduction [10]. There are additionally worries that over the top fluids managed to the mother, may influence the newborn too. Later studies found that if mothers got more than 200 ml/hour of fluids, their infants were 3.2 times more inclined to encounter overabundance weight reduction at three days contrasted with mothers who had under 100 ml/hour of liquids [11,12]. Normal newborn infants' weight 2500 to 4000gm average birth weight for newborns is around 3.5 kg at birth. Newborn weight reduction 5 % to 10 % in the initial 2– 3 days following birth is a typical, physiologic, and important occasion amid the newborn's change to extra uterine life, weight loss as result of withdrawal of hormones from mother, loss of excessive extra cellular fluid, passage of meconium (feces) and urine and limited food intake [13]. Subsequently, substantial weight misfortunes right now might be a typical physiologic response to getting an expansive fluid load amid labour and may not be related with hypohydration, lacking bosom drain creation, or sickness [14].

The ordinary little volume of breast feeding drain created in the initial 2 days following birth may raise worries about satisfactory bosom nourished babies. These worries are additionally amplified when breast feeding sustained newborn lose $\geq 7\%$ of their introduction to the world weight inside 2 days postnatal. Weight reduction following birth is apparently for the most part water misfortune that could bring about hypohydration and ensuing hypernatremic lack of hydration. Be that as it may, abundance liquid misfortune instantly following birth is an ordinary and important process. Moreover, babies presented to abundance liquid admission amid labour may need to lose $\geq 7\%$ of birth weight in the initial 2 days following birth keeping in mind the end goal to accomplish dehydration [15]. In this manner, hydration of the mother is prescribed as a minimal effort strategy without any entanglements for the embryo and the mother. Noel-Weiss found a proof identified with maternal IV liquids amid parturition and identified with neonatal yield and newborn weight reduction; particularly, a rectification in liquid adjusts not requiring mediation [12]. The impact appears time constrained, and additionally weight reduction after the initial 72 hours isn't likely associated with maternal liquids and ought not to be rejected as a liquid adjustment [15].

Verifiably, birthing assistance or midwife is one of the most professional experienced on the world. It qualities saying that deliveries went to by birthing specialists in the United States multiplied in the period in the vicinity of 1989 and 2002 from 3.3% to 7.7% separately and afterward uncovered a consistent pace of expanding as maternity specialists are the fundamental medicinal services suppliers. In the meantime, the extent of vaginal deliveries went to by maternity specialists in 2009 was 11.4% of all births. This expanding rate is comparative in different nations to a slight degree. In view of this information, the part of birthing assistants is exceptionally vital. Mothers look for the care of doctors, maternity and pediatric specialists and medical caretakers to guarantee the most secure conceivable experience for themselves and their newborns amid labour and birth [16].

Health care givers have a duty to give the most noteworthy quality care and endeavors ought to be made constantly towards change. One concentration for development in perinatal care is the absence of consideration given to keeping up fluid adjust when intravenous treatment is directed amid labour [17]. Disregarding proof based way to deal with stop or limit oral liquid amid intrapartum, routine intravenous (IV) liquid administration can bring about fluid over-burden, with subsequent maternal and newborn results. In this way, the present study was completed to help the medical attendants, birthing specialist as well as doctor to survey the impact of utilization of intrapartum liquid administration on maternal and newborn results. Also, there are no distributed conventions or rules accessible to address IV fluids administration amid labour to enhance nurture mothers and their newborns. Research is fundamental in reverberation to recognize connections among fluids got in uterus, newborn weight reduction, and hydration, as assessed with lab measures, in the initial 2 days following birth. This data will control clinicians in effectively recognizing babies with lacking hydration who need supplementary fluids versus infants with sufficient hydration for whom selective breast feeding sustaining can be upheld and energized [18].

Significant of the study:

Organization of intravenous fluids to keep parturient woman sufficiently hydrated amid labour may lessen the time of compression and unwinding of the uterine muscle, and may eventually decrease the span of the labour. It has additionally been proposed that intravenous liquids may decrease Cesarean Sections (CS) for prolonged labour and enhance the newborn results [17]. Liquid over-burden is one clinical factor that influences the mother, as well as the baby too. A newborn may show up enlarged when the mother gets abundance

intravenous fluid, the proposed supporter of newborn weight reduction [10]. There are additionally worries that unreasonable fluids controlled to the mother, may influence the newborn too.

II. Methodology

Aim of the study:

The aim of the current study was to assess the effect of intravenous fluids infusion on the progress of labour and newborn outcome.

Research questions:

- 1-What is the relationship between intravenous fluids during parturition and labour progress?
- 2-What is the relationship between intravenous fluids during parturition and newborn outcome such as weight loss at birth and seventh day after birth, feeding start time after birth and Apgar score?

Design: A descriptive correlation research design was used in the study which define as any scientific process begins with description, based on observation, of an event while a correlational study is a research method that describes and predicts how variables are naturally related in the real world, without any attempt by the researcher to alter them or assign causation between them.

Setting: Data for this study were collected from delivery room and postpartum outpatient clinic at Kafr el sheikh General Hospital, Egypt.

Sampling: A convenience sample of 150 participants in this research who had expected for normal vaginal delivery assigned during the period from 1st of January 2018 to the last of May 2018 at Kafr el sheikh General Hospital, Egypt.

Inclusion criteria: Subjects were recruited in this study based on the following inclusion criteria:

- Expected normal vaginal delivery
- Nulliparous or multiparous woman
- Mother age between 20 - more than 35 years
- During active phase of labour (cervix > 3cm dilation)
- Low-risk pregnancies
- No medical conditions such as diabetes, pre-eclampsia
- Did not suffer from any obstetric difficulties and breast feeding troubles

Exclusion criteria:

Pregnant women, who dried out, augmented or induction labours and expected cesarean section were excluded from the study as well as high risk neonate and newborns with congenital abnormalities.

Sample size:

The expectation variable in this study is the parturient women. Concentrate that surveyed the impact of intravenous liquids on the advance of labour and newborn result, thinking about level of significantness of 5%, and energy of investigation of 80%, the example size can be computed utilizing the accompanying recipe: $n = [(Z\alpha/2 + Z\beta)^2 \times \{2(SD)^2\}] / (\text{difference among the three groups})^2 = [(1.96 + 0.84)^2 \times 2(8.9)^2] / (5)^2 = 49.7$. In light of this recipe, 50 members are required in ponder group.

Group assignments:

An accommodation sample of 150 parturient women who concurred the comprehensive criteria appointed for the study sample. On permission in labor, were enrolled progressively; one by one until the point when the appointed example measure is finished. Group A mixed with IV typical saline just, Group B implanted with dextrose substituting with saline and Group C imbued with dextrose as it were.

Tools for data collection: A four data collection tools were developed by the researchers after reviewing relevant literature. They were written in simple Arabic language which included:

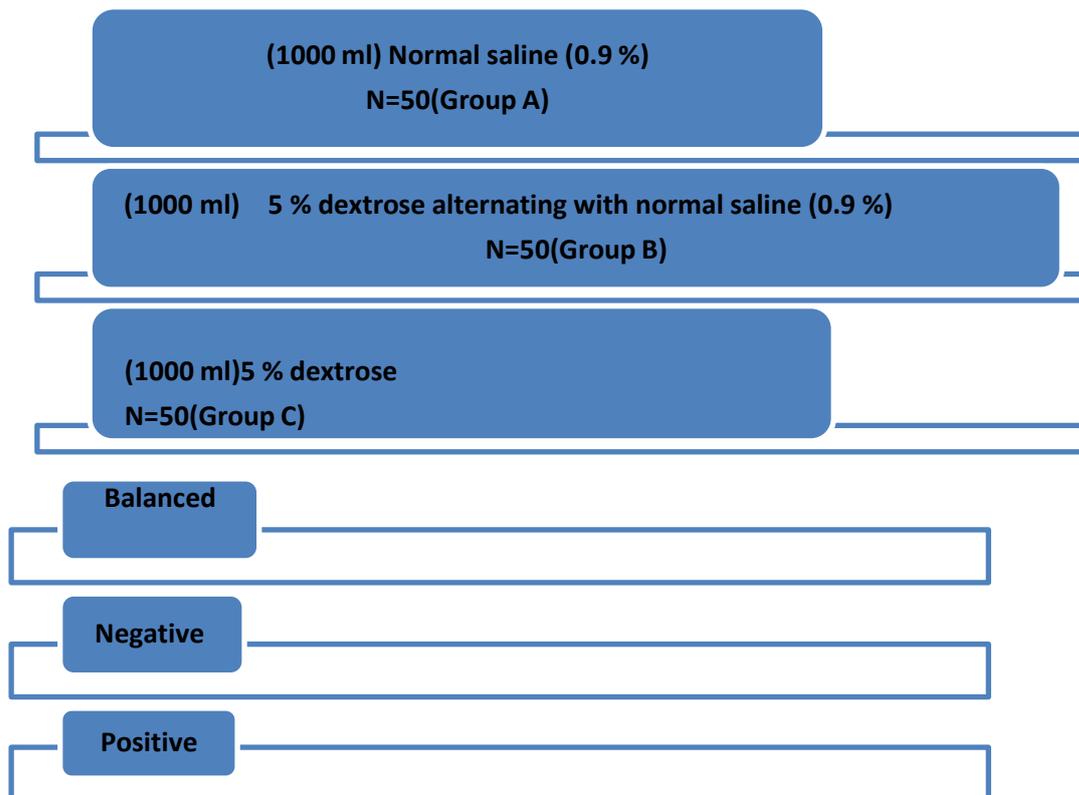
1-Maternal assessment tool: To assess the following parts:

- a- Personal history included age of mother
- b- Obstetric history included pregnancies number, deliveries number
- c- Progress of labour included time of active phase of the first stage of labour/ min, time of second and third stages/min, descent of fetal head/ cm, station, effacement, membrane intact, uterine contraction, cervical

dilatation /cm, fetal heart rate/min and maternal vital signs (blood pressure (hypotension considered 100/65mmhg) and maternal temperature(fever considered more than 38^o) through use of WHO(world health organization) Partogram sheet [18].

d-Maternal outcome included type of normal delivery through use of WHO Partogram sheet [18].

2-Maternal fluid balance chart: This graph is utilized to ascertain the liquid admission and yield for selected in the investigation, decided the sort of liquid, rate every hour and aggregate liquid got from confirmation through labour and conveyance. Liquid was administrated as doctor order by the specialist (the researcher) in every one of the cases as following diagram: Infusion drops at a rate of 60 drops/min at a rate of 120 ml/h, and were restricted to nothing by mouth. The main group got ordinary saline (0.9 %). The second group got 5 % dextrose till one container of 500 ml was finished after which normal saline (0.9 %) mixture was begun again till one bottle of 500 ml was finished. The third group got 5 % dextrose arrangement and this procedure was preceded until conveyance of newborn [19]. Intake and yield ascertained in the graph.



Fluid received and Maternal fluid balance chart

3-Apgar score tool: Is utilized for fast assessment of the newborn wellbeing condition after birth. Apgar score comprises of five target signs (newborn heart rate, respiratory rate, muscle tone, reflex irritability and color) [20]. These signs are determined a score of 0, 1, or 2 assessed at the first and fifth minutes after birth and be given an aggregate scores running from 0 to 10.

4-Newborn follow up sheet: Newborn scales were used to follow the newborn weight changes during the study. Newborn normal weight considered 2500 to 4000 g at birth. Newborn weight considered directly at birth and at the seventh day from delivery. Newborn weight was classified as (<1500g, 1500 – 2499g, 2500 – 3999g and ≥ 4000g). Newborn follows up sheet included SCBU admission (special care baby unit), newborn feeding start after birth, newborn weight at birth and at the seventh day and Apgar score which classified as (<7 and ≥7) after 1 and 5 minutes [20, 21].

Tool Validity and reliability: The tools were submitted to five specialists in the field of maternal and pediatric nursing to affirm its substance legitimacy. Alteration was completed by the group decision and pilot think about outcome on straightforwardness of sentences and the appropriateness of substance. The reliability of Apgar score tool was tested by Livingston, 1990 [22], giving consistency (inner-rater reliability) of 82%.

Administrative design:

Official agreement was obtained from the Director of Kafrelsheikh General Hospital.

Ethical consideration: Primary agreement was obtained from ethical committee at Faculty of Nursing – Kafrelsheikh University. After agreement was sought after from the director of selected hospital, and the advisor of delivery department in selected hospital, explained to the participants the general aim of the study before starting. Agreement of mothers who will give birth in the selected hospital was obtained. After the endorsement being obtained, the examiner approached mothers in the selected hospital to be invited to take part after explanation the purpose of the study. Written consent was obtained from each parturient woman who agreed to be causative in this study.

Pilot study:

The motivation behind the pilot study about was to check content clearness and appropriateness of actualizing the planned apparatuses. Time required to fill each tool and the straightforwardness of the dialect of the planned tool was additionally considered. The pilot study was done on 10% of the examination test, including 15 parturient. The group took around 15 to 20 minutes. The pilot gather was ousted from the study sample.

Research procedure:

Before conducting the study, written conformity was obtained from each parturient woman after explanation the aim of the study to be agreeing to participate in this study. All parturient women who fit the inclusion criteria and interviewed individually since admitted to labour unit to collect the initial necessary information. The researcher was visiting the Labour and Delivery department three days /week (Thursday, Friday and Saturday) for 5 hr/ daily to obtain the study sample. Each meeting took from 15 to 20 minutes. After the consent form was signed, form of assessment information was completed in the admission room. During the course of labour, intravenous fluid information was recorded by the researcher in the form of type of IV fluids, rate / hour and the total amount of IV fluid during labour. They were recruited successively; one by one until the assigned sample size is completed. Fluid was administered as doctor order by the researcher in all the cases by drop infusions at a rate of 60 drops / min at a rate of 120 ml/h, and were limited to not anything by mouth. The first group (A) received normal saline (0.9 %). The second group (B) received 5 % dextrose until one bottle of 500 ml was completed after which normal saline (0.9 %) infusion was started again until one bottle of 500 ml was completed. The third group (C) received 5 % dextrose fluids and this process was repeated until delivery of newborn [20]. Calculate the amount of fluid intake and output for mothers recruited in the study, determined the type of fluid, rate per hour and total amount received from admission through labour and delivery.

For assessment of labour progress and the researcher assessed the uterine contraction, cervical dilatation and effacement, fetal descent every hour regarding the policy of hospital, and duration of each stage of labour by using the partograph. Each woman followed up by the registrar by having vaginal examination every 2 hours; and their result were recorded on the partogram, artificial rupture of membranes was done at 4cm cervical dilatation; if any woman had overload leakage, immediate vaginal examination would be performed to rule out cord prolapse and her cervical ruling would be noted.

Measurements plotted on the partogram include cervical dilation, fetal heart rate, duration of labour and vital signs as well as the fluid initiation time. The partogram showed cervical dilation versus time include an alert line. It started at the position where there was 4 cm of cervical dilation. It is then continued slantways at a rate of 1 cm per hour in primigravida and 1.5 cm in multigravida. An action line is corresponding to the alert line, and is located 4 hours to the right of the alert line [23, 24].

Assessment of the newborn condition after delivery using Apgar score tool (at one minute and at five minutes), assess time of start of breast feeding (within 1 hour, 2 or 3 hours), SCBU admission and newborn weight at birth and the seventh day after birth [20, 21]. With reference to newborn weight, a digital electronic scale was used to weigh newborn at birth and at seventh day once upon a time daily at the same time and same circumstances through the mother and newborn follow up after birth at postpartum outpatient clinic. The researcher weighted of the newborn at birth without diaper or clothes and recorded this weight. At closely the same time the newborn was weighted without clothes or diaper at birth as well as the seventh day. While diaper, the dry diaper was weighed in grams by the researcher first then subtract the total diaper weight after wet from total weight to know the accurate newborn's weight, this if the researcher measure the newborn weight with diaper. Weigh newborn at birth in delivery room and at seventh day once through the mother and newborn follow up after birth at postpartum outpatient clinic and record the newborn's weight in newborn follow up sheet. The researcher educate the mothers to record every used diaper which was collected in plastic container every voiding or defecation and weigh them in addition any other output in the form of vomiting or diarrhea were assessed and subtract of them from total weight, when the mothers weigh their newborn at home.

Outcome:

Primary outcome:

The relationship between IV fluids infusion and labour progress.

Secondary outcome:

The relationship between IV fluids infusion and newborn outcome especially weight of newborn at birth and seventh day after birth as well as Apgar score (at one and five minutes) and time of initiate of breast feeding after labour.

Limitation of the study: It would have been better to repeat the assessment once again at a large sample size later on time.

Statistical analysis:

Every measurable investigation was performed utilizing SPSS for windows variant 20.0 (SPSS, Chicago, IL). Information was tried for typicality of circulation before any counts. Every persistent data were regularly disseminated and were communicated in mean \pm standard deviation (SD). Unmitigated information was communicated in number and rate. The correlations were resolved utilizing Student's t test for factors with ceaseless information and chi-square test for factors with all out information. The statistical significant was set at $p < 0.05$.

III. Results Of The Study

Result findings of the current study are presented in four sections each one described the study factors in relation to IV fluids given (normal saline alone, glucose alternating with saline and glucose alone). Distribution of the study sample according to their personal and obstetric data with the fluid received, distribution of the sample according to labour progress with the fluid received, distribution of the sample according to the maternal outcome with the fluid received and distribution of the newborn according to outcome with fluid received.

The study included 150 pregnant women, divided into 3 groups, the normal saline alone group, the glucose alternating with saline group and the glucose alone group. Each group contained 50 parturient women. The personal and the obstetric characteristics of the study sample are shown in Table 1. The 3 groups were matched regarding the age of the mothers, gravidity and parity.

The duration of the active phase in the 1st stage of labour was significantly shorter in the glucose alternating with saline group than in the normal saline alone group and the glucose alone group (226.9 ± 63.6 , 309.9 ± 69.7 and 370.3 ± 71.8 minutes respectively, $p < 0.001$). Similarly, The duration of the 2nd stage of labour in the glucose alternating with saline group was 85.1 ± 42.0 minutes while the duration was longer in the glucose alone group (95.1 ± 38.0 minutes) and was further longer in the normal saline alone group (116.7 ± 44.3 minutes). These differences were significant ($p < 0.001$). On the other hand, the duration of 3rd stage of labour did not differ significantly among the groups (Table 2 and Figure 1).

The fetal head descent was significantly greater in the glucose alternating with saline group (4.65 ± 0.46 cm) compared to the normal saline alone group and the glucose alone group (2.08 ± 0.74 and 3.63 ± 0.42 cm, respectively). These differences were significant ($p < 0.001$) (Table 2). The station of fetal head in the glucose alternating with saline was 0.6 ± 0.5 while the station of fetal head in the normal saline alone group and glucose alone was 1.4 ± 0.5 and 1.5 ± 0.5 respectively. The differences in the station of fetal head were significant ($p < 0.001$) (Table 2). Fetal effacement was significantly greater in the glucose alternating with saline group than in the normal saline alone group and glucose alone group (85.0 ± 3.7 , 73.8 ± 8.4 and 79.8 ± 5.2 % respectively, $p < 0.001$) (Table 2). Cervical dilatation as well was significantly greater in the glucose alternating with saline group than in the normal saline alone group and glucose alone group (5.4 ± 0.5 , 4.0 ± 0.8 and 4.6 ± 0.5 cm respectively, $p < 0.001$) (Table 2).

The spontaneous rupture of the membranes was significantly more frequent in the glucose alternating with saline group (60%) than in the normal saline alone group (20%) and the glucose alone group (20%) ($p < 0.001$) (Table 2). As shown in Table 2, 60% of the women in the glucose alternating with saline group had severe uterine contraction compared to 40% of the in the normal saline alone while only 20% of the in the glucose alone group had severe uterine contraction. These differences among the group were significant ($p < 0.001$). In addition, 80% of the fetuses from mothers in the glucose alternating with saline group had improved heart rate compared to 60% of the fetuses from mothers in the normal saline alone group and 70% of the fetuses from mothers in the in the glucose alone group. These differences were significant ($p = 0.017$).

On the other hand, the rate of vaginal delivery, forceps delivery, and occurrence of maternal hypotension or fever did not differ significantly among the groups (Table 3).

The newborn outcome by the fluid received regarding the time of start of breast feeding, the newborn weight at birth and at 7 days, the Apgar score at 1 minute and 5 minutes, newborn weight and SCBU admission

were shown in the (Table 4 and Figure 2). It is clear from this table that, majority 92% of the newborns which their mothers in glucose alternating with saline group were started feeding within 1.00 hour after delivery compared to approximately three quarter 76% and 74% of the newborns in normal saline alone group and glucose alone group respectively. These differences among the groups were significant ($p < 0.05$).

Concerning the newborn weight, there was no significant difference between newborns in three groups in relation to their weight at birth time and at 7th day after birth when their mothers received fluid, majority of newborns' weight were in range 2500 – 3999gm at birth and majority of them their weight were in range 1500 – 2499gm at 7th day after birth in three groups (Table 4 and Figure 2).

Regarding the Apgar score at 1 minute and 5 minutes after birth, the Apgar score at 1 minute was significantly greater in the glucose alternating with saline group (8.2 ± 1.8) of the newborns Apgar score were ≥ 7 , compared to the normal saline alone group and the glucose alone group (7.4 ± 1.5 and 7.5 ± 1.6 respectively). These differences were significant ($p < 0.05$). Also, the Apgar score at 5 minutes was significantly greater in the glucose alternating with saline group (8.8 ± 1.7) of the newborns Apgar score were ≥ 7 , compared to the normal saline alone group and the glucose alone group (7.6 ± 1.5 and 7.7 ± 1.4 respectively). These differences were significant ($p < 0.001$) (Table 4).

Regarding the SCBU admission, the newborns in the glucose alternating with saline group were less admitted in SCBU than newborns in the normal saline alone group and the glucose alone group, there were differences between three groups but did not differ significantly by the fluid received in three groups (Table 4).

Table 1: Distribution of the study sample in proportion to their personal and obstetric data with the fluid received (n=150)

	Normal saline alone (n=50)		Groups Glucose alternating with saline (n=50)		Glucose alone (n=50)		Chi-square	
	N	%	N	%	N	%	X ²	p
Age (years)								
20 – 35	27	54	22	44	20	40		
> 35	23	46	28	56	30	60	2.093	0.351
Mean \pmSD	29.3 \pm 1.9		29.5 \pm 1.8		28.9 \pm 1.7		1.437*	0.241
Parity								
Primipara	14	8	8	16	5	10		
Multi para	33	66	40	80	40	80		
Grand multipara	3	6	2	4	5	10	6.934	0.139
Gravida								
Primigravid	12	24	8	16	6	12		
Multi gravid	30	60	34	68	34	68		
Grand multi gravida	8	16	8	16	10	20	2.788	0.594

* t value, Student's t test

Table 2: Distribution of the sample in accordance with labour progress with the fluid received (n=150)

	Normal saline alone (n=50)		Groups Glucose alternating with saline (n=50)		Glucose alone (n=50)		Student's t test	
	Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD	t	p		
Duration of stages of labour (min)								
Active phase of first stage	309.9 \pm 69.7	226.9 \pm 63.6	370.3 \pm 71.8	55.307	<0.001sig			
Second stage	116.7 \pm 44.3	85.1 \pm 42.0	95.1 \pm 38.0	7.568	<0.001sig			
Third stage	8.60 \pm 1.45	8.17 \pm 1.30	8.21 \pm 1.35	1.508	0.225			
Fetal head descent (cm)	2.08 \pm 0.74	4.65 \pm 0.46	3.63 \pm 0.42	268.486	<0.001sig			
Station of fetus	1.4 \pm 0.5 (1 – 2)	0.6 \pm 0.5 (0 – 1)	1.5 \pm 0.5 (1 – 2)	53.570	<0.001sig			
Effacement of fetus (%)	73.8 \pm 8.4 (60 – 89)	85.0 \pm 3.7 (80 – 91)	79.8 \pm 5.2 (71 – 90)	41.932	<0.001sig			
Dilatation of cervix (cm)	4.0 \pm 0.8 (3 – 5)	5.4 \pm 0.5 (5 – 6)	4.6 \pm 0.5 (4 – 5)	65.029	<0.001sig			
Membrane condition								
Intact	18	36	10	20	23	46		
Spontaneous ruptured	10	20	30	60	10	20		
Artificial ruptured	22	44	10	20	17	34	25.508*	<0.001sig
Uterine contraction								
Mild	20	40	10	20	25	50		
Moderate	10	20	10	20	15	30		
Severe	20	40	30	60	10	20	17.792*	<0.001sig
Fetal heart rate								
No change	8	16	9	8	10	20		

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Deteriorated	12	24	1	2	5	10		
Improved	30	60	40	80	35	70	11.984*	0.017sig

* X² value, chi square test; sig= significant

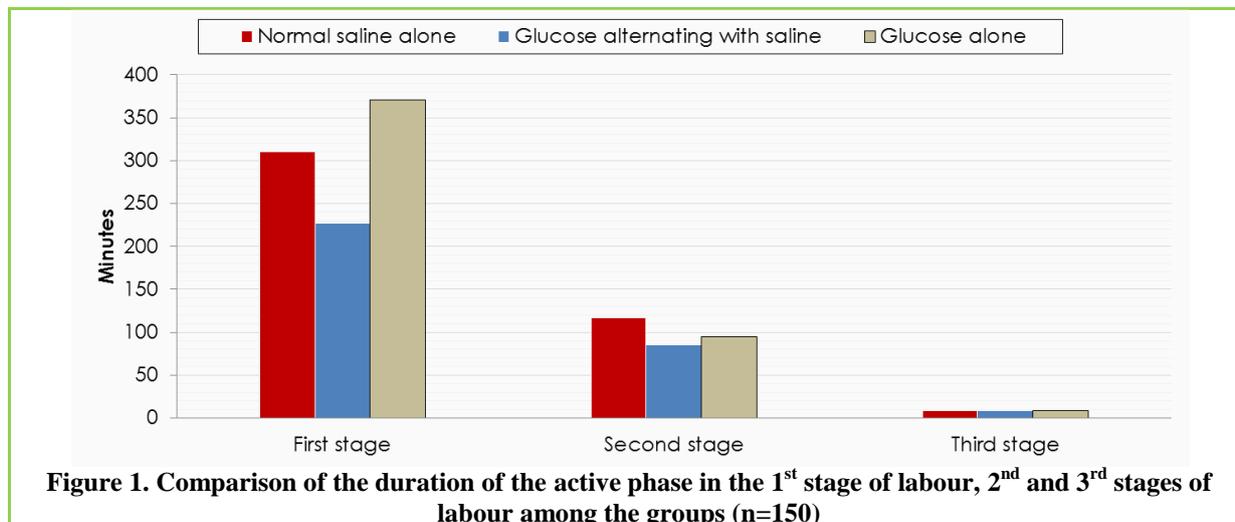


Figure 1. Comparison of the duration of the active phase in the 1st stage of labour, 2nd and 3rd stages of labour among the groups (n=150)

	Normal saline		Groups		Glucose alone		Chi-square	
	(n=50)		(n=50)		(n=50)			
	N	%	N	%	N	%	X ²	p
Type of delivery								
Vaginal delivery	40	80	47	94	45	90		
Forceps delivery	10	20	3	6	5	10	4.924	0.085
Maternal vital signs								
Hypotension	2	4	1	2	3	6	1.042	0.594
Fever	1	0	0	0.0	2	4	2.041	0.360

	Normal saline		Groups		Glucose alone		Chi-square	
	(n=50)		(n=50)		(n=50)			
	N	%	N	%	N	%	X ²	p
Time of start of breast feeding								
Within one hour	38	76	47	92	37	74		
Within two hours	6	12	2	4	4	2		
Within three hours	6	12	1	2	9	18	9.617	0.047sig
Newborn weight at birth/g								
<1500	2	4	0	0	0	0		
1500 – 2499	8	16	6	12	7	14		
2500 – 3999	40	80	44	88	43	86		
≥ 4000	0	0	1	1	0	0	6.477	0.372
Newborn weight at 7 day/g								
<1500	1	2	3	6	2	4		
1500 – 2499	45	90	47	94	46	92		
2500 – 3999	4	8	0	0.0	2	4	5.043	0.283
Apgar score at one minute								
<7	9	18	1	2	8	16		
≥7	41	82	49	98	42	84	7.197	0.027
Mean ±SD	7.4 ±1.5		8.2 ±1.8		7.5 ±1.6		3.540	0.032 sig
Apgar score at five minutes								
<7	8	16	0	0	7	14		
≥7	42	84	50	100	43	86	8.444	0.015
Mean ±SD	7.6 ±1.5		8.8 ±1.7		7.7 ±1.4		9.366	<0.001sig
SCBU admission	3	6	1	2	2	4	1.042	0.594

SCBU= Special care baby unit

* X² value, chi square test; sig= significant

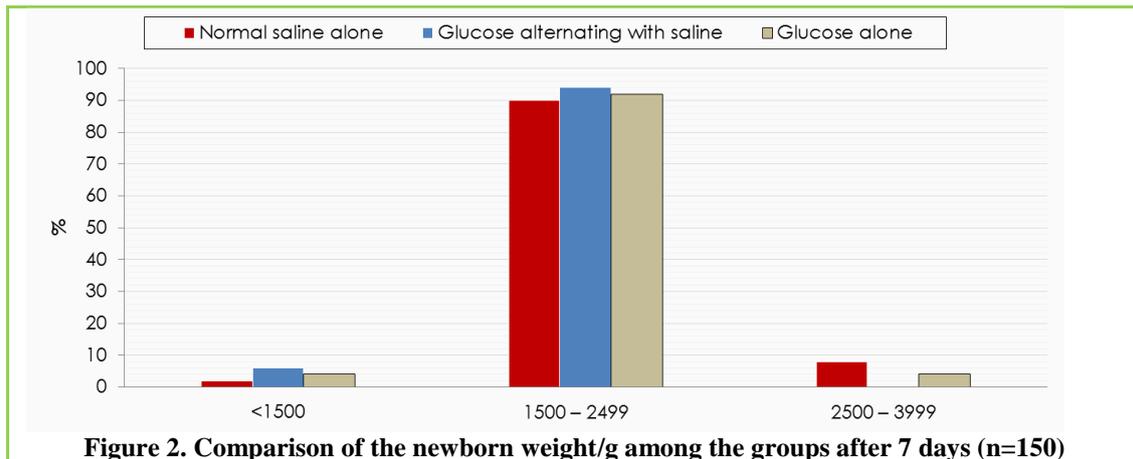


Figure 2. Comparison of the newborn weight/g among the groups after 7 days (n=150)

IV. Discussion

This study aimed to assess the effect of intravenous fluids infusion on the progress of labour and newborn outcome. The present study found that the age of women extended from 20 – in excess of 35 yrs old and the three groups of intravenous liquids (normal saline alone, glucose alternating with saline and glucose alone) demonstrated likenesses in regards to their age, equality and gravidity. As respect labour progress the length of the active stage in the first phase of labour was altogether shorter in the glucose substituting with saline group than in the normal saline alone group and the glucose alone group. Likewise, the duration of the second phase of labour. These distinctions were noteworthy ($p < 0.001$). Then again, the length of third phase of labour did not contrast altogether among the groups. The fetal head descent, the station of fetal head, cervical dilatation and the unconstrained burst of the membrane were altogether more noteworthy in the glucose substituting with saline group than in the normal saline alone group and glucose alone group. The women in the glucose substituting with saline group had serious uterine withdrawal contrasted with the women in the normal saline alone or the women in the glucose alone group. 80% of the fetuses from mothers in the glucose rotating with saline group had enhanced heart rate contrasted with ordinary saline alone or glucose alone group. Then again, the rate of vaginal delivery, forceps delivery, and event of maternal hypotension or fever did not contrast essentially among the groups. The time of beginning of breastfeeding was started early and the Apgar score at 1 minute and 5 minutes were significantly improved in the glucose rotating with saline group more than ordinary saline alone or glucose alone groups. On the other hand, the newborn weight and SCBU affirmation did not vary altogether by the liquid got. So the study findings answered the questions of the study and accomplished the study aim.

In connection to the principal question concerning the connection between intravenous liquids amid labour and labour progress, the present study uncovered a significant distinction between various kinds of IV liquids given (ordinary saline just, glucose and saline, glucose just) and the length of the active phase of the first stage of labour contrasted with alternate stages and phases of labour. The present finding concurred with Dawood, Dowswell and Quenby examine who expressed that regulating differed IV liquids to nulliparous women brought down the labour length of 1781 women with an arbitrary determination of cases [17]. The most indispensable discoveries of this investigation uncovered an unmistakable drop in labor term between women conveyed vaginally in the wake of regulating glucose rotating with saline. Besides, this study demonstrated that imbue ment of dextrose rotating with saline were connected with diminished labour span (mean of term of active phase, length of second and third stage were (5.39 hours, 11.54 second and 8.30 second separately). The consequences of the present study announced brief span of the active phase of labour and also second phase of labour. In the present study the term of the active phase in the first phase of labour was altogether shorter in the glucose exchanging with saline group than in the ordinary saline alone group and the glucose alone group (226.9 ± 63.6 , 309.9 ± 69.7 and 370.3 ± 71.8 minutes separately, $p < 0.001$). Essentially, The span of the second stage of labour in the glucose substituting with saline group was 85.1 ± 42.0 minutes while the length was longer in the glucose alone group (95.1 ± 38.0 minutes) and was further longer in the ordinary saline alone group (116.7 ± 44.3 minutes). These distinctions were significant ($p < 0.001$). Though consequences of different studies recommended that labour length could be diminished by directing IV liquids at a rate of 250ml/hr which is superior to giving such liquids in a rate of 125ml/hr. In this manner, clearly managing glucose exchanging with saline amid the labour procedure is more significant for diminishing the course of labour El Kordy [25]. Starting at yet, regular running of intravenous liquids in labor has not been assessed sufficiently. A Randomized Controlled Trial "RCT" was conveyed by Moghadam, and Rezaeian to differentiate the effect of glucose liquids alone or saline alone on labour term and the advancement of labour including ominous results among 120 laboring women [26].

The lion's share significant findings of this study demonstrated that the mean length of active phase in a mass got I.V liquids of glucose exchanging with saline not as much as saline alone and glucose alone, and also there was measurably significant contrast between the three groups in connection to cervical dilatation, span of the active phase and the liquid got through labour as the term of active phase wound up shorter when the IV liquid of glucose and saline were as one, the span was diminished essentially. There were noteworthy significant difference between groups in labor length amid the first stage and additionally vaginal delivery while there was no significant contrast between groups in the second, third stages of labour time and no significant distinction in the fetal descent, fetal heart rate, station, effacement, membrane intact, uterine contraction. The past findings were conversely with the present study identified with there was no significant distinction in the fetal descent, contraction, station, effacement, membrane intact since it is evident that type and rate of IV liquids is a vital component in the course of treatment of labouring woman predominantly utilizing the glucose exchanging with saline IV liquid to reduce labour length and in demanding the drawn out labour. A planned research was surrendered out at Shariati Hospital, Tehran by Eslamian, Marsoosi and Pakneey at among 300 nulliparous women [5]. The example isolated into two groups, group (1) implanted 125 ml for every hour (glucose exchanging with saline) and group (2) injected 250 ml for every hour of Ringer arrangement intravenously. The outcome uncovered that the group that mixing intravenous fluid (glucose rotating with saline) at a rate of 250 ml for each hour had a length of labour essentially shorter. And also cervical dilatation, fetal descent, fetal heart rate, station, effacement, membrane intact, uterine contraction and maternal vital signs, for example, hypotension and fever altogether better in the group that getting intravenous liquid (glucose exchanging with saline). These findings were concur with the present study which uncovered shorter term of active phase and labour progress improvement may be identified with the similarities in the kind of IV arrangements or rate of infusion.

Though a further reports led by Tender, et al & Coco, et al. hoped to recognize the impact of IV liquids on labour length among 80 parturient woman utilizing a case control plan with arbitrary task of on IV liquids gathering and normal care aggregate [27, 28]. The creator utilized glucose exchanging with saline on a rate of 120 ml/hr crosswise over with active labour. The most essential findings of this examination uncovered no distinction in labor length of in the IV liquids group and with 9.5 hour in the IV liquids group and 9.4 hours in the normal care group. At the indistinguishable line, there was other than no significant difference in the span of labour in divergent labour stages and also in cervical dilatation, fetal drop, fetal heart rate designs and maternal vital signs. Thus, this examination demonstrated that diverse IV liquids does not bring down the term of labour. These findings were conversely with the present study which uncovered shorter term of active stage and labour advance improvement may be identified with the distinctions in the sample size.

Medicinal services suppliers normally utilize a newborn's weight reduction in the initial couple of days of life as an amount of powerful nourishing. Breastfeeding or expanded equation bolstering is much of the time discretionary when the newborn achieves weight reduction of seven to 10% of birth weight [29, 30 & 14].

As respects the second research question asking the connection between intravenous liquid amid labour and newborn weight reduction at birth and at seventh days after birth, feeding start time after birth and Apgar score, the present findings found no critical distinction in connection to their weight when their moms got the three kinds of liquids. These findings at no indistinguishable line with aftereffect of a partner consider on 109 by Noel-Weiss, et al. who investigated the connection between the intravenous liquids get amid labour (the make a move of conceiving an offspring, incorporating time in labor) and their newborn's weight reduction amid the initial 72 hours baby blues [12]. In particular, they compressed that there would be positive connection between maternal intravenous IV liquids got amid labour and weight reduction by the newborn. The examination demonstrated that there was a positive relationship between weight reduction and kinds of liquid. They discovered proof that maternal IV liquids amid labour are identified with newborn weight reduction. In a similar setting Chantry, et al. discovered that expanded newborn weight related with maternal liquid adjust speaks to loss of abundance liquid in the infant and their discoveries were fundamentally identified with maternal intrapartum liquid adjust, the acclimated along these lines of hazard for intemperate weight reduction more than doubled when positive maternal liquid adjust more than 200 ml/hour, conversely with 100 ml/hour [11]. Since weight reduction may convey a bigger danger of later morbidities, expanded mindfulness to protective techniques is demonstrated. These findings were conversely with the present study which demonstrated that newborn weight did not vary fundamentally by the liquid got that distinction may be identified with the distinctions in the example size or sum and rate of IV liquids. There are primary contrast between their investigation and the present study: Information were gathered from first day and seventh day, separately; with our study, relationships amongst liquids and weight reduction not showed up at first day and also following 7 days. Liquid sums and longer information accumulation period may have represented the results in this examination. Then again Lamp and, Macke directed an examination on 200 woman and infant to watch prescient relationship among intrapartum maternal liquid admission, birth type, neonatal yield, and neonatal weight reduction amid the initial 48 hours after birth [31]. They satisfied that neonatal weight reduction was not

fundamentally identified with intrapartum maternal liquid admission. These results were in similarities with the present study which may be identified with the closeness in the example size or amount and rate of IV liquids they demonstrated that neonatal weight reduction overstated by kind of encouraging and standard number of wet diapers. A cross-sectional investigation by Hirth, Weitkamp and Dwivedi inspected the relationship of the maternal intravenous liquids set amid labour, and newborn most extreme weight reduction amid healing center admission [32]. From side to side survey of medicinal reports for 186 mothers and their infants who conveyed at an ensured doctor's facility in Ohio. This maternal sort and rate of IV liquids emphatically related with infant most astounding weight reduction. Rate of IV liquids every hour were observed to be extensively connected with most noteworthy weight reduction. For every one percent expansion in normal ml every hour, the infant maximum utmost weight reduction percent will increment. The outcome likewise affirmed that, 95% of the babies began breast feeding within 1.00 hour after delivery, while the most reduced rate 1.3% were newborn that began nourishing following 2.00 hours. These results were in similarities with the present study which revealed that, majority of the newborns in the glucose exchanging with saline group were started breast feeding early at 1 hour compared to three quarter of the newborns in saline alone group and the glucose alone group.

Concerning Apgar score at 1 and 5 minutes. Our examination was found that, there was statistical significant difference between newborns in three groups, the Apgar score at 1 minute was significantly greater in the glucose alternating with saline group (8.2 ± 1.8) of the newborns Apgar score were ≥ 7 , compared to the normal saline alone group and the glucose alone group (7.4 ± 1.5 and 7.5 ± 1.6 respectively). Also, the Apgar score at 5 minutes was significantly greater in the glucose alternating with saline group (8.8 ± 1.7) of the newborns Apgar score were ≥ 7 , compared to the normal saline alone group and the glucose alone group (7.6 ± 1.5 and 7.7 ± 1.4 respectively), this result was disagree with Sharma et al [33], they were performed a randomized control trial comparing 5 % dextrose with normal saline to evaluate acid base balance in neonate. They observed no differences in Apgar score and acid base balance in both groups.

In this manner the current study answer the second research question about the connection between intravenous liquid amid parturition and newborn weight, time of start feeding after birth and Apgar score, the newborn weight did not contrast altogether by the liquid got at the 1 day and seventh day following delivery, but there was statistical significant difference between newborns in three groups regarding time of start feeding after birth and Apgar score, At long last consequently glucose rotating with saline IV liquids will enhances the progress of labour. As well as, improved newborns Apgar score and initiate of breast feeding early. Then again the newborn weight did not vary altogether by the liquid got.

V. Conclusion

In light of the outcome exposed by the present study, the present examination pointed at number of conclusions, the consequences of the study achieved a critical significant difference between the length of active phase and sort of liquid got through labour, thusly glucose alternating with saline IV liquids will enhances the progress of labour, newborn Apgar score and initiate of breast feeding early, then again the newborn weight, did not vary significantly by the liquid got, as indicated by the outcome, aim and research questions of the current study, these study results achieved the study aim and answered the study questions.

Recommendations

It is prescribed to: Additional examinations with bigger example sizes, more results and diverse IV liquids focus is required to choose the precise impact of them. Increment awareness of medical caretakers or birthing assistants about the noteworthiness of IV liquid amid parturition. Hold out different studies identifying with the impact of intravenous liquid amid parturition on labour progress by utilizing a huge sample from unique and different spots of the country. Additional study is expected to approve relationships between maternal IV liquid and newborn weight reduction. Exact observing of the quantity of wet diapers in the first day and precise day by day weights during childbirth time can prompt convenient uncovering and discovery of babies in danger to maintain a strategic distance from impressive weight reduction.

References

- [1]. Mendelson, C. (2002). Aspiration of stomach contents during anesthesia. *Am J Obstet Gynecol.*, 109 (2) 178-81.
- [2]. Movahed, F., Pakniat, H., Ataee, M., Barikani, A., & Jamsi, L. (2015). Normal Saline and Dextrose-Saline Infusion Comparison in the Duration of Active Phase in Nulliparous Women. *Biotechnology and Health Sciences*, 2(4) : e31666.
- [3]. Steingrimsdóttir, T., Ronquist, G., Ulmsten, U., & Waldenström, A. (1995). Different energy metabolite pattern between uterine smooth muscle and striated rectus muscle in term pregnant women. *European Journal of Obstetrics & Gynecology and Reproductive Biology*. 62(2), 241-245.
- [4]. Garite, T. J., Weeks, J., Peters-Phair, K., Pattillo, C., & Brewster, W. R. (2000). A randomized controlled trial of the effect of increased intravenous hydration on the course of labor in nulliparous women. *American Journal of Obstetrics & Gynecology*, 183(6), 1544-1548.
- [5]. Eslamian, L., Marsoosi, V., & Pakneeyat, Y. (2006). Increased intravenous fluid intake and the course of labor in nulliparous women. *International Journal of Gynecology & Obstetrics*, 93(2), 102-105.

- [6]. **Shrivastava, V. K. (2011).** A randomized, double-blinded, controlled trial comparing parenteral normal saline with and without dextrose on the course of labor in nulliparas. *American Journal of Obstetrics & Gynecology*, 202(1), 167-189.
- [7]. **Dapuzzo-Argiriou L, Smulian J, Rochon M, Galdi L, Kissling J, Schnatz P et al. 2015.** A multicenter randomized trial of two different intravenous fluids during labour. *Journal of Maternal, Fetal & Neonatal Med.*, 1-6.
- [8]. **Fong, A., Serra, A., Caballero, D., Garite, T., & Shrivastava, V. (2015).** A randomized, double-blinded, controlled trial of the effects of rate and/or presence of dextrose on the labor course of nullipara. *American Journal of Obstetrics & Gynecology*, 212(1), S299.
- [9]. **Shrivastava, V. K., Garite, T. J., Jenkins, S. M., Saul, L., Rumney, P., Preslicka, C., & Chan, K. (2009).** A randomized, double-blinded, controlled trial comparing parenteral normal saline with and without dextrose on the course of labor in nulliparas. *American Journal of Obstetrics & Gynecology*, 200(4), 379e1-6.
- [10]. **Watson J, Hodnett E, Armson BA, Davies B, Watt-Watson JA (2012).** randomized controlled trial of effect of intrapartum intravenous fluid management on breastfed newborn weight loss. *Journal of Obstetric, Gynecol Neonatal Nurs.*:41(1):24-32.
- [11]. **Chantry, C. J., Nommsen-Rivers, L. A., Peerson, J. M., Cohen, R. J., & Dewey, K. G. (2010).** Excess weight loss in first-born breastfed newborns relates to maternal intrapartum fluid balance. *Pediatrics*, peds-2009.127(1) e171-e179.
- [12]. **Noel-Weiss, J., Woodend, A. K., Peterson, W. E., Gibb, W., & Groll, D. L. (2011).** An observational study of associations among maternal fluids during parturition, neonatal output, and breastfed newborn weight loss. *International breastfeeding journal*, 6(1), 9.
- [13]. **Okumus, N., Atalay, Y., Onal, E. E., Turkyilmaz, C., Senel, S., Gunaydin, B. & Unal, S. (2011).** The effects of delivery route and anesthesia type on early postnatal weight loss in newborns: the role of vasoactive hormones. *Journal of Pediatric Endocrinology and Metabolism*, 24(1-2), 45-50.
- [14]. **Mulder, P. J., & Gardner, S. E. (2015).** The healthy newborn hydration model: A new model for understanding newborn hydration immediately after birth. *Biological research for nursing*, 17(1), 94-99.
- [15]. **Dekker R. Copyright Evidence Based Birth 2012.** Available at <http://evidencebasedbirth.com/are-iv-fluids-necessary-during-labour/>
- [16]. **BE, F., Sheehan, K., Plyley, M., Law, M., Montelpare, W. J., & Wiens, L. (2015).** The role of Intrapartum intravenous therapy and Newborn Weight loss: challenging the 7% Rule. *Birth*, 373(292), 324-277.
- [17]. **Dawood, F., Dowswell, T., & Quenby, S. (2013).** Intravenous fluids for reducing the duration of labour in low risk nulliparous women. *The Cochrane Library*. Syst Rev;(6):CD007715. doi: 10.1002/14651858.CD007715.
- [18]. **Kwast, B. E., Lennox, C. E., Farley, T. M. M., & Olayinka, I. (2000).** World Health Organization partograph in management of labour. *The Lancet*, 343(8910), 1399- 1404.
- [19]. **Swidan, K. H., Abou-gamrah, A. A., AbdelShafy, A., & Abughanima, M. O. (2017).** Effect of Normal Saline Infusion versus Dextrose 5% Infusion on The Duration of Labor in Nulliparous Women: Randomized Controlled Trial. *Egyptian Journal of Hospital Medicine*, 68(3), pp 1452-1461.
- [20]. **Apgar, V. (1952).** A proposal for a new method of evaluation of the newborn. *Classic Papers in Critical Care*, 32(449), 97.
- [21]. **Lopez, P. O., & Bréart, G. (2012).** Trends in gestational age and birth weight in Chile, 1991–2008. A descriptive epidemiological study. *BMC pregnancy and childbirth*, 12(1), 121..
- [22]. **Livingston, J. (1990).** Interrater reliability of the Apgar score in term and premature infants. *Applied Nursing Research*, 3(4), 164-165.
- [23]. **Ganesh, D. (2014).** Preventing prolonged labour by using partograph. <https://en.m.wikipedia.org/wiki/Partogram>
- [24]. **Movahed, F., Pakniat, H., Ataee, M., Barikani, A., & Jamsi, L. (2015).** Normal Saline and Dextrose-Saline Infusion Comparison in the Duration of Active Phase in Nulliparous Women. *Biotechnology and Health Sciences*, 2(4).
- [25]. **El Kordy, Z. 2015;** Relationship between intravenous fluid during parturition and labour progress\ newborn weight loss in Jordanian governmental hospital, UN publishes Master thesis.
- [26]. **Direkvand-Moghadam, A., & Rezaeian, M. (2012).** Increased intravenous hydration of nulliparas in labor. *International Journal of Gynecology & Obstetrics*, 118(3), 213-215.
- [27]. **Tender, J. A., Janakiram, J., Arce, E., Mason, R., Jordan, T., Marsh, J., ...& Moon, R. Y. (2009).** Reasons for in-hospital formula supplementation of breastfed infants from low-income families. *Journal of Human Lactation*, 25(1), 11-17.
- [28]. **Coco, A., Derksen-Schrock, A., Coco, K., Raff, T., Horst, M., & Hussar, E. (2010).** A randomized trial of increased intravenous hydration in labor when oral fluid is unrestricted. *Family medicine*, 42(1), 52-56.
- [29]. **Academy of Breastfeeding Medicine Protocol Committee. (2009).** ABM clinical protocol# 3: hospital guidelines for the use of supplementary feedings in the healthy term breastfed neonate, revised 2009. *Breastfeeding Medicine*, 4(3), 175-182.
- [30]. **Eidelman, A. I., Schanler, R. J., Johnston, M., Landers, S., Noble, L., Szucs, K., & Viehmann, L. (2012).** American Academy of Pediatrics. Breastfeeding and the use of human milk. *Pediatrics*, 129(3), e827-e841.
- [31]. **Lamp, J. M., & Macke, J. K. (2010).** Relationships among intrapartum maternal fluid intake, birth type, neonatal output, and neonatal weight loss during the first 48 hours after birth. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 39(2), 169-177.
- [32]. **Hirth, R., Weitkamp, T., & Dwivedi, A. (2012).** Maternal intravenous fluids and infant weight. *Clinical Lactation*, 3(2), 59-63.
- [33]. **Sharma, C., Kalra, J., Bagga, R., & Kumar, P. (2012).** A randomized controlled trial comparing parenteral normal saline with and without 5% dextrose on the course of labor in nulliparous women. *Archives of gynecology and obstetrics*, 286(6), 1425-1430.

Halaabd El Fattah Ali. "The Effect Of intravenous Fluids infusion on The Progress of Labour And Newborn Outcome". IOSR Journal of Nursing and Health Science (IOSR-JNHS), vol. 7, no.4, 2018, pp. 06-17.