Journal of Nursing Science
2015; 1(3): 25-33
Published online July 30, 2015 (http://www.aascit.org/journal/jns)

Keywords
Glucose Monitoring,
Evidence Based,
Breast Feeding,
Nursing Intervention

Received: June 17, 2015
Revised: June 27, 2015
Accepted: June 28, 2015

Neonatal Glucose Monitoring and Its Management after Caesarean Section: Evidence Based of Breast Feeding

Nagwa A. Zein El Dein[1], Nema abd El Gawad[2], Nadia abd El Hamid[2]

[1]Pediatric Nursing Faculty of Nursing Menoufia University, Shebin El Kom, Menoufia, Egypt
[2]Maternal and Newborn Health Nursing, Faculty of Nursing, Helwan University, Cairo, Egypt

Email address
Nagwa_ahmedzin@ymail.com (N. A. Z. EL Dein),
future_nursing@hotmail.com (N. abd El Gawad)

Citation
Nagwa A. Zein El Dein, Nema abd El Gawad Nadia abd El Hamid. Neonatal Glucose Monitoring and Its Management After Caesarian Section: Evidence Based of Breast Feeding. *Journal of Nursing Science.* Vol. 1, No. 3, 2015, pp. 25-33.

Abstract
There is limited evidence-based consensus regarding the monitoring and management of risk for neonatal hypoglycemia. The nurse is placed in a unique position to routinely offer critical hypoglycemia prevention strategies. So, the Aims of this study were to monitor glucose and provide maternal breast feeding guidance to manage neonatal hypoglycemia. Design Pre-post interventions quiz experimental design was used. Tool consists of three tools the first one a structured interview questionnaire for biosocial characteristics of sample as well health history of mothers and their neonates, the second was Observational Check list on mothers practices for initiation of breast feeding. Derived from Clinical Practice Discussion Check list WHO/CDR/ and UNICEF/NUT/ (2012) as well as assessment of neonatal signs of hypoglycemia. and the third tool was glucometer glucose testing strips. Results indicated that about half of the assessed neonates presented with neonatal hypoglycemia eliminated to 20,89% after 4hrs of continuous breast feeding representing their evidence, more than half of mothers initiate breast feeding after1-<2hrs hrs, and majority of mothers don't follow their pregnancy. Recommendations Programs should be held in neonatal and obstetric units to raise awareness of mothers about signs of neonatal hypoglycemia and its sequels, Replicate the study in a national scale to ensure generalization of results.

1. Introduction

Hypoglycemia is one of the life threatening issues neonates face during transition to extra uterine life (Barnes-Powell, 2007). When the umbilical cord is cut, mobilization of infant glucose stores and/or nutritional support by feeding are required to mediate endogenous insulin. If glucose is not available, the infant becomes hypoglycemic, and the brain and other vital organs are depleted of glucose necessary to maintain homeostasis. The American Academy of Pediatrics (AAP; 2011) recommended putting an infant to breast within the first hour of life to stabilize infant glucose. However, Georgia et al (2014) stated a number of questions remain unresolved. Hypoglycemia has been linked to poor neuro-developmental outcome, and hence aggressive screening and treatment is recommended, especially when it discovered and managed easily. So, supervised breast-feeding may be an initial treatment option in asymptomatic hypoglycemia. However, symptomatic hypoglycemia should always be treated with a continuous infusion of parenteral dextrose.

The AAP, 2011Committee on Fetus and Newborns published the first revision of the neonatal hypoglycemic guidelines since 1993 (AAP, 1993, 2011). This evidence-based practice guideline is a step toward standardization of treatment for neonatal hypoglycemia through the following steps: (a) identification of infants at risk, (b) assessment of blood glucose levels that require intervention, (c) treatment criteria with intravenous (IV) and/or oral nutrition, (d) frequency of blood glucose monitoring, and (e) delineation of neonatal symptoms of hypoglycemia. (Straussman & Levitsky, 2010) determine blood glucose levels used to define neonatal hypoglycemia ranged from a threshold of ≤ 25 to 50 mg/dl. When treatment for an asymptomatic infant was debated, all sources agreed that an infant that exhibited symptoms should be medically treated.

Research studies indicate that routine hypoglycemia screens, treatments, and interventions in the healthy infant are not evidence-based and result in a serious disruption of the initiation of breast feeding process and duration patterns of lactation is apparent. Moreover, there is little practical value in measuring, or treating, the blood glucose concentrations of asymptomatic, normal term babies in the first 2 hours after birth. Furthermore, even in those situations in which low blood glucose concentrations do develop secondary to prolonged intervals (>8 hours) between breast feedings, a marked ketogenic response occurs. Also, there were no universally accepted standards for a serum glucose level that is considered to accurately define hypoglycemia in the newborn infant. There were problems with determining specific glucose levels that signal concern. This is due to several factors that we must use whole blood, serum or plasma for accurate measurement of blood glucose levels, and most of screening methodologies have a problem with counted feeding methods. (Sallie and Goertz, 2010 &Harris et al, 2012).

Breastfeeding is supported by state and international governmental agencies for management of neonatal hypoglycemia as (New York State Department of Health, NYS, 2011; World Health Organization [WHO], 2011), professional organizations (AAP, 2011). All of these organizations recommend that stable infants be managed by (a) initiation of breastfeeding within the first hour of life, (b) demand feedings with the mother and infant in close proximity, (c) avoidance of bottles or pacifiers, and (d) exclusive breastfeeding for at least 6 months. Maternal/infant contact is considered one of the best predictors for breastfeeding success. Nurses has the unique opportunity to emphasize breastfeeding education beginning with preconception visits and continuing through prenatal care, delivery, postpartum care, and during ongoing care of the neonates, with sound breastfeeding knowledge and practices breastfeeding should be observed and evaluated for evidence of successful breastfeeding behavior. (NYS DOH, 2011; Nommsen-et al, 2010).

2. Significance of the Study

Hypoglycemia is the most common metabolic problem in neonates. It occur in approximately 1-3 out of every 1,000 births and the estimation of incidence of hypoglycemia depends on the definition of the condition and the methods by which blood glucose concentrations are measured. Recommendations for health care practices include screening of neonatal hypoglycemia during the first postpartum days and developing a restricted protocol for maternal / neonatal nursing intervention (Singh,2014).

3. Conceptual Framework

Sandelowski's theory of technology dependency provides an appropriate conceptual framework for analyzing the appropriate clinical practice of early glucose screening in term, healthy breastfed neonates (reliance on devices and techniques to resolve health-related needs. By the healthy neonate within the first 3 postnatal hours; this, in turn, is often interpreted as pathologic neonatal hypoglycemia (the evaluation becomes the disease). The misdiagnosis of hypoglycemia leads to treatments and interventions that include formula supplementation, mother-baby separation, and further neonatal surveillance (unintended, undesirable outcomes of technology dependency). result in short- and long-term consequences including difficulties in breastfeeding initiation, delays in lactogenesis, impaired breast milk production, early breastfeeding discontinuance rates, and lowered maternal confidence (by products of technology dependency that result in further morbidity or far-reaching social outcomes). Monitoring is a preliminary procedure, such as a test or examination, to detect the most characteristic signs of a disorder that may require further investigation (Sandelowski, 1993).

4. Operational Definitions

4.1. Hypoglycemia

Many authors have suggested those numeric definitions of hypoglycemia, usually between 30 and 50 mg/dL (1.7 to2.8 mmol/L) and varying by postnatal age (Sallie and Goertz, 2010, Jain et al 2010).

4.2. Aim of the Study

The aim of this study was glucose monitoring and nursing management for hypoglycemic term healthy through breast feeding fulfilled through the following objectives

1-Monitoring of blood glucose for term healthy neonates

2-Provide maternal breast feeding guidance in the first hours of life to manage elicited cases of neonatal hypoglycemia.

4.3. Research Hypotheses

The percentage concentration of glucose level will be increased after 4 hrs of continuous breast feeding.

5. Methodology; I-Technical Design

The technical design for the study includes; design, setting and tools

Design: Pre-post interventions quiz experimental design.

5.1. Setting

Post partum Unit at Ain- Shams University Hospital

5.2. Samples

1- Purposive sample was selected from obstetric unit including (80) mothers' delivers by caesarian section.

2- Neonates (80) who fulfilled study criteria for a period of 8 months elicited from (100) neonates

5.3. Inclusion Criteria

1- Postpartum mothers with in the 1st 4 hrs after C. Section.

2- Mothers not having feeding problems.

3- Newborn with hypoglycemia, glucose level 30->50mg/dl

4- Both mothers and neonates were free from any medical condition

5.4. Exclusion Criteria

1-Newborn with blood glucose level more than < 50mg/dl

2- Mothers / neonates with breast feeding problems.

5.5. Tools of the Study

Tool One, It divided into 2 parts

Part one

Structured interview questionnaire developed by the researcher including socio demographic and obstetric history of mothers and their newborn as age, educational levels, type of delivery, health and diabetic history during pregnancy. As well as neonatal sex and history during labor.

Part II

Observational Check list on mothers practices for initiation of breast feeding. Derived from Clinical Practice Discussion Check list WHO/CDR/and UNICEF/NUT/ (2012). The Scale consists of observation for general condition of the mothers for their ability to talk, asking questions, then, assessing breast feeding practices including positions and latch on the baby, lastly give mothers confidence and support skills through praising and advice.

Tool II

Neonatal assessment sheet developed by the researcher after through of related literature includes general condition of the baby, (sleepy or screaming), vital sign, primitive reflexes and signs of hypoglycemia.

Tool III

Testing method for hypoglycemia (glycometer)

Glucose testing strips used for screening of neonatal hypoglycemia through glycometer. a pinprick of blood from the foot was taken after sterilized by alcohol. A drop of blood placed on the reagent-impregnated paper strip for the specified time which induces a color change that correlates with blood glucose concentration. The actual blood glucose concentration was determined by "reading" the color of the strip with a reflectance colorimeter that has been calibrated using a standard solution. This procedure done at obstetric ward *(Jane,1999)*

II-Operational design

Development of the tools

A-Validity and reliability of the tools

Validity was established after a through review of literature about knowledge related to hypoglycemia. The original questions were revised and expanded to improve clarity, precision, and to develop comprehensive question sets about neonatal hypoglycemia. Mothers and nurses informed that the interview was voluntary and anonymous. The revised items were sent to a panel of pediatric nursing experts including 2 neonatologists, 1 obstetrician, expertise for assessment of face validity, readability, accuracy, completeness, and ease of completion. Minor revisions were then made based on their feedback, including the need for baseline knowledge (variation in normal blood glucose level for newborn, and preterm) that were incorporated into the final questionnaire. Data collection occurred from November 2013 through June 2014.

Reliability analysis for 1st and 2nd scale was used to determined the extend to which the items in the questionnaire are related to each others. Results of the pilot study were also used to confirm reliability (Test- retest reliability). The findings suggested that the current questionnaire could be used as a valuable tool for data collection.

Reliability of Testing method

Although use of a reflectance colorimeter to read the test strips improves precision, multiple studies comparing various methods have found that the correlation between "real" blood glucose values and values obtained using test strips remains highly variable. Assessment of hypoglycemia by this method will detect approximately 85% of cases. So, a confirmatory sample should be sent to a central laboratory if a test strip value is consistent with hypoglycemia or if the test strip result is in the normal range but clinical findings raise the suspicion of hypoglycemia. (Jane,1999)

b - Pilot study

It was conducted for (10) mothers and their neonates to assess clarity, simplicity and applicability of the tools. The participant of the pilot study were excluded from study sample.

Field Work

-Official letter obtained from the faculty of nursing Helwan University to director of Ain Sham University Hospital obstetric department.

-Mothers were first interviewed for their socio demographic and health history data as well assessed and observed for their ability for breast feeding practices.

-Assess readiness to feed before initiating oral feeding by Evaluate the coordination of sucking, swallowing, and breathing. Behaviors demonstrating success include smooth, regular respirations and hand activity near the face with good posture. Also assess behavioral feeding cues which includes:

Rooting reflex, sucking movements/sounds, and opening of mouth in response to tactile stimulation. Evaluate the mother's position for breastfeeding, latch and her believes about breast feeding such as amount of colostrums secretion etc.

-Neonatal assessment was done before feeding for their general condition and screened for glucose level and the elicited hypoglycemic baby was managed through initiation of breast feeding

-Continuous monitoring for the baby condition was done two times every 2hr for the first 4hrs through using of Glycometer to assess the prognosis of the baby which reflect the effect of breast feeding success

-If the glucose value was 40–45 mg/dL (2.2–2.6 mmol/L) or more, frequent feedings should be established and the neonate followed clinically as warranted.

-If the neonate has a glucose value below 40–45 mg/dL (2.2–2.6 mmol/L), the baby should immediately be put to continue the breast fed.

If the neonate exhibits abnormal clinical signs, has glucose value below 40–45 mg/dL (2.2–2.6 mmol/L), and refuses or does not tolerate feedings, the researcher should repeat trial with the mother about the initiation of breast feeding.

-Carefully document response to breast feeding with symptomatic infant or infants with glucose levels 20 to 25 mg/dl and refer to physician for further evaluation and management.

-Encourage frequent breastfeeding and provide mothers with elicited hypoglycemic baby a discharge plan for signs of hypoglycemia and its correction.

Discharge Planning

Teach mothers and assess learning about signs of hypoglycemia including: Poor feeding, hypothermia, abnormal cry, irritability, lethargy, tremors, jitteriness, hypotonia, or seizures and any change in level of consciousness Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN,2010) [13].

Administrative design

Official letter was obtained from the dean of the faculty of nursing – Helwan University to the director of Obstetric and Gynecological Hospital – Ain Shams University, after the agreement obtained the study conducted

5.6. Ethical Consideration

It was obtained through simple description of the procedure to the mother and inform them about their right of acceptance or refuse to be involved in the study. More over inform them by safety of procedure of glucose monitoring as well as identify them with the end results of their neonatal glucose monitoring.

5.7. Statistical Analysis

The collected data were categorized, tabulated and analyzed using the computer program (SPSS Version 14). Qualitative data were expressed as frequency and percentage. chi squared used for categorical variables. Correlations were done using Spearman's correlation coefficients estimated to determine associations between variables. P value was considered to be statistically significant *at* $P < 0.05$ and percentage of glucose were presented in coefficient chart.

6. Results

Table (1). *Percentage distribution of biosocial characteristics of mothers and their newborn.*

Biosocial characteristics	No	%	X^2	P. Value
Mean Mothers age				
Mean ±Sd=26.8±5.8				
Mothers level of education				
Illiterate	1	1.3	59.1	.000
Primary education	40	50.0		
Secondary education	34	24.4		
University	5	6.3		
Newborn sex				
Boys	47	58.1	2.45	.118
Girls	34	41.9		
Newborn gestational age				
Less than 37 weeks	6	7.4	78.7	.000
38-40 weeks	72	88.9		
41 weeks or more	3	3.7		
Type of newborn				
Full term	73	90.1	72.7	.000
Premature	6	7.4		
Twins	2	2.5		
Newborn weight				
>2500 gram	18	22.2	104.7	.000
2500-3000 gram	59	72.8		
<3000 gram	4	4.9		

Percentage distribution of biosocial characteristics of mothers and their newborn showed that the mean mother's age were 26.8+5,8. Half of mothers have primary education, and have boy newborn. Majority of newborn (88,9%) gestational age were ranged between 38-40 weeks and their weight ranged between 2500-3000 gram.

Health history of mothers represented that more than thirty percent of them were pregnant for one or three time. Majority of them didn't have history of previous diseases and the minorities of them have hypertension, as well the three quarter of them didn't receive prenatal follow up and majority of their neonates were sleepy when examined. Number of elicited cases of hypoglycemia eliminated from about half (48,75%) of the neonates after 2 hrs to (21.25%) after 4 hrs

Assessment of mother's breast feeding practices represented that more than half of mothers initiate breast feeding 1-< 2hrs from cesarean section, while (33.7%) initiate their breast feeding from 2hrs-<3hrs. Majority of mothers (81%) continue to breast feeding more than 5 times. Also, most of mothers (76.3) know feeding position and provided with breast feeding counseling

There were insignificance difference (P>0.05) between different signs of elicited cases of hypoglycemia with percentage of glucose level pre intervention, While there

were a significance difference after 2 hrs (P<.004) and 4hrs (P<.002) for different signs of elicited cases of hypoglycemia after breast feeding intervention.

Table (2). *Health history of mothers and their neonates.*

Assessment of mothers and neonates health history	No	%	X^2	P. Value
Number of pregnancy				
Once	28	35.0		
Twice	16	20.0	21.3	.000
Three	31	38.5		
More than three	5	6.5		
History of diseases during pregnancy				
Yes	13	16. 5	4.05	.044
No	67	83. 5		
Type of diseases				
Hypertension	9	11.2		
Diabetes mellitus	2	2.5	70.7	.000
Liver diseases	1	1.2		
Preeclampsia	1	1.2		
Prenatal follow up				
Yes	20	25.0	20.00	.000
No	60	75.0		
General condition of the newborn				
Sleepy	64	79.1	28.8	.000
Screaming	17	20.9		
Number of cases of hypoglycemia				
Elicited cases of hypoglycemia (pre intervention)	80	100.0	31.07	.003
Elicited cases of hypoglycemia after 2 hrs	39	48.75		
Elicited cases of hypoglycemia after 4 hrs	17	21.25		

Table (3). *Assessment of mother's breast feeding practices N=80.*

Assessment of mothers breast feeding practices N=80	No	%	X^2	p-value
Initiation of breast feeding				
1-< 2hrs	46	57.5		
2hrs- <3hrs	27	33.7	62.1	.000
3-< 4hrs	7	8.8		
Number of breast feeding trial after birth				
1-5	15	18.7	31.25	.000
More than 5 time	65	81.3		
Provide breast milk substitute				
Yes	4	5.0	64.8	.000
No	76	95.0		
Know feeding positions				
Yes	61	76.3	22.5	.000
No	19	23.7		
Mothers provided with breast feeding counseling				
Yes	70	87.5		
No	10	12.5	45.0	.000

Table (4). *Relationship between percentage of glucose level with signs of hypoglycemia at Different time from breast feeding intervention.*

Signs of hypoglycemia	Percentage of glucose								Total		X^2	P.
	20-29		30-39		40-49		More than 50					
	No	%	No	%	No	%	No	%	No	%		
Signs pre intervention												
Lethargy	2	5.12	0	0.0	1	2.56	1	2.56	7	14.39		
Cyanosis	4	10.25	1	2.56	0	0.0	3	7.69	8	20.51		
Apnea	5	12.82	2	5.12	1	2.56	1	2.56	9	23.07		
Hypothermia	1	2.56	1	2.56	1	2.56	2	5.12	5	12.82	.947	11.71
Poor sucking	2	5.12	1	2.56	1	2.56	1	2.56	5	12.82		
Seizures	1	2.56	1	2.56	0	0.0	0	0.0	2	5.12		
Irritability	2	5.12	0	0.0	0	0.0	1	2.56	3	7.69		
High pitched cry	2	5.12	0	0.0	1	2.56	0	0.0	3	7.69		
Total	19	48.71	6	15.38	5	12.82	10	25.64	39	100.0		
Signs after 2 hrs from intervention												
Lethargy	2	9.52	0	0.0	0	0.0	1	4,46	3	14.2	33.189	.004
Cyanosis	5	23.8	2	9.52	2	9.52	0	0.0	9	42.85		

Signs of hypoglycemia	Percentage of glucose								Total		X^2	P.
	20-29		30-39		40-49		More than 50					
	No	%	No	%	No	%	No	%	No	%		
Hypothermia	5	23.8	2	9.52	0	0.0	0	0.0	7	33.3		
Poor sucking	0	0.0	1	4,46	0	0.0	0	0.0	1	4,46		
Seizures	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0		
Irritability	0	0.0	0	0.0	1	4,46	0	0.0	1	4,46		
Total	12	57.14	5	23.8	3	14.2	1	4,46	21	100.0		
Signs after 4 hrs from intervention												
Lethargy	2	11.76	0	0.0	0	0.0	1	5.88	3	17.64		
Cyanosis	0	0.0	2	11.76	0	0.0	0	0.0	2	11.76		
Hypothermia	0	0.0	0	0.0	3	17.64	0	0.0	3	17.64		
Poor sucking	1	5.88	3	17.64	1	5.88	0	0.0	5	29.41	36.105	.002
Seizures	3	17.64	0	0.0	0	0.0	0	0.0	3	17.64		
Irritability	1	5.88	0	0.0	0	0.0	0	0.0	1	5.88		
Total	7	41.17	2	11.76	4	23.52	1	5.88	17	100.0		

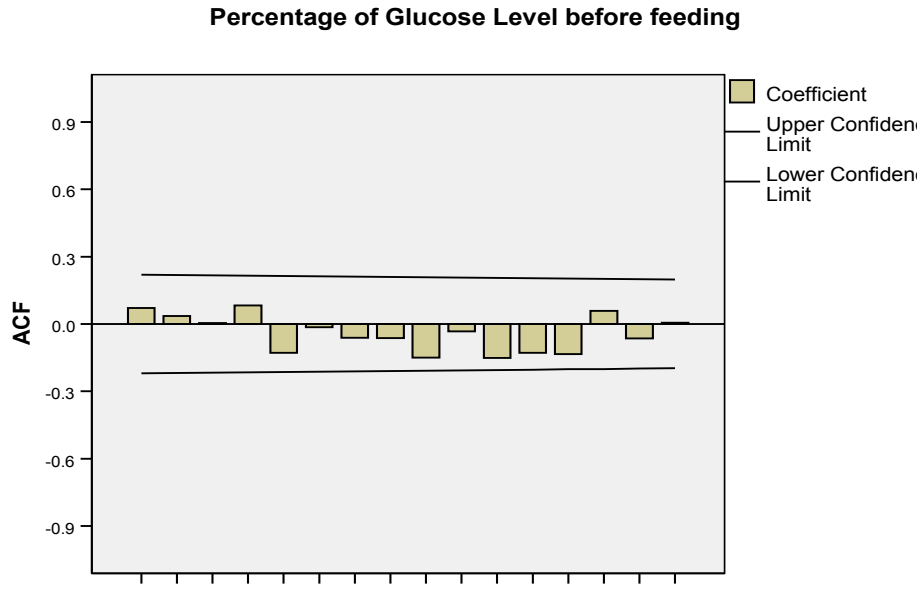

Figure (1). *Showed eliminated percentage level of glucose 30-<50 mg/dl before initiation of breast feeding of neonates.*

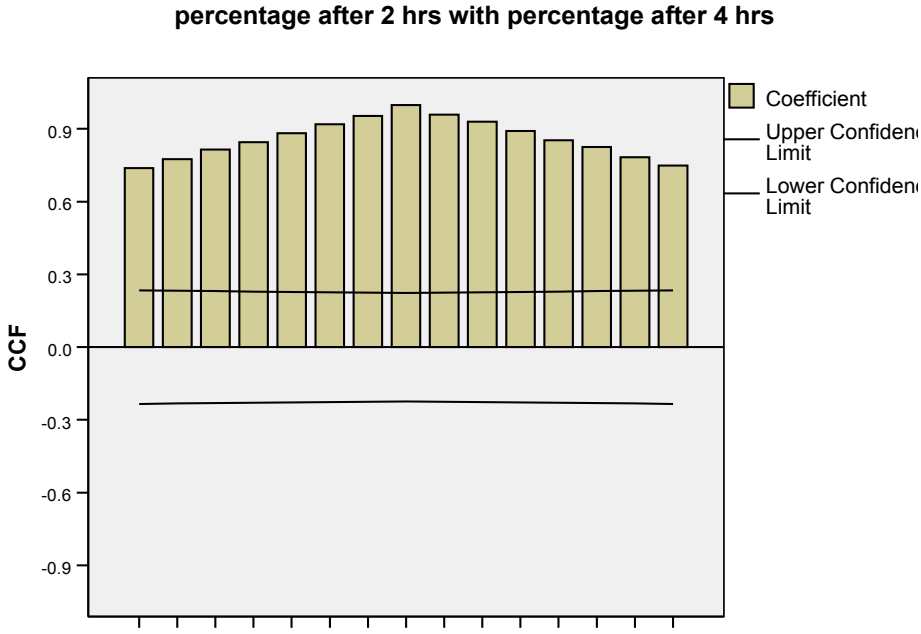

Figure (2). *Showed increased percentage of glucose level above 50 mg//dl after 2 and 4 hrs of continuous breast feeding.*

Table (5). *Correlations between neonatal general conditions and glucose percentages at different time from continuous breast feeding.*

Correlations	General condition of newborn, sleepy or screaming	Percentage of glucose after 4 hrs of feeding	Percentage of glucose level after 2 hrs from breast feeding intervention	Percentage of Glucose Level before feeding intervention
Percentage of Glucose Level before feeding	.122	.962(**)	.963(**)	1
	.282	.000	.000	
percentage after 2 hrs	.141	.977(**)	1	.963(**)
	.211	.000		.000
Percentage of glucose after 4 hrs of feeding	.161	1	.977(**)	.962(**)
	.154		.000	.000
Gestational age	-.056	-.008	.016	.002
	.620	.944	.888	.989
General condition of newborn	1	.161	.141	.122
Number of neonates	80	80	80	80

** Correlation is significant at the 0.01 level (2-tailed).

There were appositive correlations between percentage of glucose before feeding, after 2hr of feeding, after 4 hrs of feeding and provide breast milk. While there were negative correlations between percentage of glucose at different time with neonatal general condition, gestational age, or neonatal weight.

7. Discussion

Routine glucose screening of the term, healthy neonate is not an evidence-based clinical practice, and serves as a significant detriment to successful breastfeeding behaviors. So, nurses acts as an important facilitator of labor, birth, and postpartum events. As regards to table (1) indicate that, the biosocial characteristics of studied mothers showed that the mean age was 26.8±5.8 and (50%) of them had primary level of education and majority of them were provided by breast feeding counseling This is in accordance with (Elfeqi,2011) who reported that majority of women had a low level of education. This is also, in agreement with Egyptian Demographic Health Survey (EDHS, 2008), which mentioned that the educational level of household member because its associated with many phenomena including reproductive behavior and abuse of health of children Sultana,(2012) also found that breastfeeding women did not receive the information and support they needed from hospital nurses, with women stating that they wanted consistent advice, information and acknowledgment of their breastfeeding experiences. These women also wanted encouragement and physical help with positioning specially when half of mothers have primary education and they were in younger age.

Relationship between different signs of hypoglycemia at different time subsequently relieved with continuous breast feeding with significant difference after three and four hrs from breast feeding intervention UCSF Medical Center For Children (2004) mentioned that the subjective experience of hypoglycemia is influenced by ambient glucose levels. Higher resting levels of glucose may falsely increase and baby's sensitivity to the symptoms of hypoglycemia. Thus, preventative action may be initiated to increase blood glucose levels that are already below normal,

Health history of mothers and their neonates revealed that more than one third of mothers were newly mothers which they were not have prior experience with initiating breast feeding. These results support by (Sifferlin, 2013) who found that new moms often don't have proper support and education about breast-feeding, and its importance in preventing hypoglycemia which can lead to anxiety and a greater likelihood of stopping nursing. Regarding parity results showed that more than one third of mothers were primipara, 20% has twice children and more than one third have three children. Nearly the same results were found by Galhotra et al.2008. When parity of mothers was observed. Also, there were minor percentage of mothers have gestational diabetes and hypertension Aziz, and Dancey; (2014) in his Cohort studies demonstrate that IDMs frequently experience asymptomatic hypoglycemia by 1 h of age, supporting earlier screening in this population and found that the average times for finding low glucose levels in Large for Gestational age (LGA) and Small for gestational age (SGA) infants were 2.9 h (range 0.8 h to 8.5 h) and 6.1 h (range 0.8 h to 34.2 h), respectively. One can infer that hypoglycemia usually occurs in LGA infants and IDMs within 12 h of birth, and screening beyond this period is not required if blood glucose is maintained at 2.6 mmol/L or higher. In addition, there were 22% of the study neonates have low birth weight less than 2500 gm Aziz, and Dancey; (2014) stated that preterm and low birth weight infants may be vulnerable from sequel of hypoglycemia up to 36 h of age and perhaps later, particularly if regular feeds or intravenous infusions are not yet established. In contradiction (Jane, 1999) stated that low-birth weight infants tolerated hypoglycemia better than normal-weight neonates. In fact, these data reflected failure of hepatic glucose production in preterm infants in response to an inadequate supply of exogenous substrate. So, if standard feeding practices had not been established for this population, and reliable intravenous (IV) nutrition was not available those infants were slightly affected by hypoglycemic sequels (Aziz, and Dancey 2014).

General assessment of newborn represented that majority of newborn were sleepy instead of screaming without

significance correlations between their general condition with percentage of glucose level at different time. American Academy of Pediatrics, (2005) recognizing that crying is a very late sign of hunger or hypoglycemia. However this present in a minority of the sample (20,9%) So, the sleepy condition revealed the effect of receiving mothers' general anesthesia for caesarian section on their neonates.

Early breastfeeding is not precluded just because majority of the infant meets the criteria for glucose monitoring stability. More than half of mothers initiating breast feeding at about 1-< 2hrs hrs from birth because of their general condition after caesarian section with different trial for initiation and frequency ranged between five time or more among majority of them. The American Academy of Pediatrics, (2005) recommended that Healthy term infants should initiate breastfeeding within 30 to 60 minutes from birth and continue on demand.

Presentation of percentage of glucose concentration presented lowering level of glucose among neonates after birth this percentage become elevated after 3 hrs and 4hrs of measurement from continuous breast feeding. This percentage estimated about half of the assessed neonates eliminated to 21,25% when measurement repeated after 4 hrs, this results is consistent with Aziz, and Dancey; (2014) who's stated that neonatal glucose levels fall during the first hour or two after birth, reaching a natural through before rising to stable neonatal levels. The value of screening of well babies during this time is limited, and recommended that infants at risk be screened at 4 h to 6 h of age, and asserting that no studies demonstrate harm from a few hours of asymptomatic hypoglycemia. In the other hand, Infants at risk for hypoglycemia should be screened by measuring blood sugar by Glucometer at ages 1, 2, 4, 6, 9 and 12h. (De Rooy, and Howden. 2002) stated that at-risk babies should receive at least one effective feed before a blood glucose check at 2 h of age and should be encouraged to feed regularly thereafter. UCSF Medical Center For Children (2004).

Correlation between glucose concentration before feeding represented a significance difference (P<.005) with their percentage after 2->3 hrs and 4 hrs, of gestational age, and providing breast feeding. (Jack, 2009) Studies of exclusively breastfed, appropriate-for-gestational-age, term babies, show that blood glucose falls immediately after birth from two-thirds of maternal levels to the 5th percentile of approximately 1.8 mmol/L at 1 h of age. There is a subsequent rise to levels over 2.0 mmol/L that is maintained for 72 hrs. Madhu, and Ramesh (2009) mentioned that the best way to prevent low blood sugar is to feed the baby with breast milk. However, formula and breast milk (specifically colostrums in these early days) are not equivalent but it still far better to prevent and treat low blood sugar than formula.

Limitations

Reagent test strip results used through glucometer were susceptible to variations in the technique used to obtain the sample (e.g. variability in the amount of blood applied to the strip or contamination of the sample by residual isopropyl alcohol on the skin), Thus, to ensure accurate detection of low blood glucose concentrations, the results of glucometer should be compared with laboratory tests to be reliable on the diagnosis of hypoglycemia.

8. Conclusion

About half of the assessed neonates presented with neonatal hypoglycemia and eliminated to 21,25% after 4 hrs of continuous breast feeding representing their evidence to manage neonatal hypoglycemia, more than half of mothers initiate breast feeding before 1-< 2hrs from birth. So, this is an evidence based for beneficial effect of breast feeding to manage neonatal hypoglycemia.

Recommendations

1-Programs should be held in neonatal and obstetric units to aware mothers and nurses about signs of neonatal hypoglycemia and its sequels.

2- Replicate the study in a national scale to ensure generalization of results.

Recommendations' for Future Research

1. The development of more reliable bedside testing blood glucose methods at bedsides of neonates to increase the efficiency of diagnosis and treatment of significant glucose drop among neonates immediately after birth.

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