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Course: Master Thesis in Sexual, Reproductive and Perinatal Health, 15 hp.

Supplement feeding at the maternity ward

-a retrospective medical record review

Tillmatning på BB

-en retrospektiv journalgranskning

Master Thesis in Sexual, Reproductive and Perinatal Health, 15 hp.
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Abstract

Background: Previous studies have shown that breastfeeding is one of the most effective ways to ensure child health. Moreover, the benefits of breastfeeding for both mother and infant are well established. However, in spite of known positive effects of breastfeeding, supplement feeding is increasing and exclusive breastfeeding is decreasing.

Objective: The primary objective was to investigate medical and non-medical reasons for supplement feeding at the maternity ward. Our secondary objective was to compare:

- maternal, obstetric and infant characteristics between the supplement feeding groups
- breastfeeding frequency at discharge between the supplement feeding groups

Method: This study was a retrospective medical record review, using a quantitative approach. A total of 160 infants, who received supplement feeding, were included in the study. Two groups were compared: medical and non-medical reason for supplement feeding in order to analyse if there were statistical differences regarding breastfeeding at discharge.

Results: The reason for supplementation was 54 percent medical whereas 46 percent non-medical. The most common reported non-medical reason for supplement feeding was “fussy infant” and the most reported medical reason was “risk for hypoglycaemia”. The chi-square test showed no significant association regarding reasons for supplement feeding and breastfeeding at discharge. Findings also showed out that partial breastfeeding was the most common feeding practice at discharge.

Conclusion: The majority of infants received supplement feeding based on medical decision. Characteristics that affected supplement feeding were maternal or neonatal risk factors for hypoglycaemia, who initiated supplement feeding and infant age for first supplement. Among infants in the study, the frequency of exclusive breastfeeding at discharge was low.

Keywords: Supplement feeding, Breastfeeding, Infant, Medical record review.

Sammanfattning

Bakgrund: Tidigare studier har visat att amning är en av de mest effektiva metoderna att säkerställa barns hälsa. Dessutom är fördelarna med amning för mamma och spädbarn väl etablerade. Samtidigt ökar tillmatning och helamning minskar trots känd positiv effekt av amning.

Syfte: Det primära syftet var att undersöka medicinska och icke-medicinska orsaker för tillmatning på eftervårdsavdelning. Det sekundära syftet var att jämföra:

- maternella-, obstetriska- och spädbarnskaraktäristika mellan tillmatningsgrupperna
- amningsfrekvens vid utskrivning mellan tillmatningsgrupperna.

Metod: En retrospektiv journalgranskning genomfördes för att samla in data, med kvantitativ ansats. Totalt ingick 160 spädbarn som hade blivit tillmatade. Två grupper: medicinska och icke-medicinska orsaker för tillmatning jämfördes med amning vid utskrivning, för att analysera om det fanns statistiska skillnader.

Resultat: Orsaken för tillmatning var 54 procent medicinsk och 46 procent icke medicinsk. Den valigaste orsaken till icke-medicinsk tillmatning var ”oroligt spädbarn” och den vanligaste orsaken till medicinsk tillmatning var ”risk för hypoglykemi”. Chi-2 test visade ingen statistisk association mellan orsak till tillmatning och amning vid utskrivning. Resultatet visade också att delamning var det vanligaste sättet att äta vid utskrivning.

Slutsats: Majoriteten av spädbarn tillmatades baserat på medicinska skäl. Karaktäristiska som påverkade tillmatning var maternella- eller neonatala riskfaktorer för hypoglykemi, vem som initierade tillmatning och spädbarnets ålder vid första tillmatningstillfället. Bland spädbarnen i studien var frekvensen av helamning låg vid hemgång.

Nyckelord: Tillmatning, Amning, Spädbarn, Journalgranskning

Table of content

1. Background 1
1.1 Benefits of breastfeeding 1
1.2 Determinants of breastfeeding 2
1.2.1 Support 2
1.2.2 Skin-to-skin 2
1.3 Risk factors causing breastfeeding problems 2
1.4 Breastfeeding and its stigma 3
1.5 Hypoglycaemia 3
1.5.1 Symptoms of hypoglycaemia 3
1.5.2 Neonatal risk factors for hypoglycaemia 4
1.5.3 Maternal risk factors for hypoglycaemia 4
1.6 Supplement feeding 4
1.6.1 Marketing of supplement feeding 5
1.6.2 Acceptable medical reasons for supplement feeding according to WHO 6
1.7 Problem definition 6
2. Objective 7
3. Methods 7
3.1 Study design 7
3.2 Study group 7
3.3 Data collection 9
3.3.1 Definitions 10
3.3.2 Variables 11
3.4 Bias 12
3.5 Statistical analyses 13
3.5.1 Descriptive statistics 13
3.5.2 Chi-squared test 13
4. Ethical considerations 13
5. Results 14
5.1 Reasons for supplement feeding 16
5.1.1 Non-medical reasons for supplement feeding 16
5.1.2 Medical reasons for supplement feeding 17
5.2 Comparison of study characteristics between medical and non-medical reasons for supplement 18
5.3 Feeding practice at discharge 20
5.3.1 Breastfed within two hours 20
5.3.2 Mode of delivery 20
6. Discussion 21

6.1 Result discussion 21
6.2 Method discussion 24
7. Conclusion 25
8. References 27
9. Attachments 32
9.1 Appendix (1) 32
9.2 Appendix (2) 33

1. Background

According to the World Health Organisation (WHO, 2019) breastfeeding is one of the most effective ways to ensure child health and survival. Furthermore, WHO recommends exclusive breastfeeding the first six months, with continued breastfeeding along with adequate complementary food for the child, up to two years of age. The definition of exclusive breastfeeding is that the infant only receives breast milk without any additional food or drink. Innocenti declaration written by UNICEF (2015) clarifies a global goal for optimal maternal and child health and nutrition. All women should be enabled to practice exclusive breastfeeding and all infants should be fed breast milk exclusively.

To address equality, breastfeeding plays an important role by providing equal opportunity to all children to grow and contribute to national economies (Hansen, 2016). Previous studies explain the importance of political and financial encouragement and support to initiate breastfeeding (Forster et al, 2015; Rollins et al, 2016).

1.1 Benefits of breastfeeding

The benefits of breastfeeding are well established. Breastfeeding benefits the mother by preventing breast cancer, improve birth spacing and reduce the risk of ovarian cancer and diabetes. Breastfed infants have lower infectious morbidity and mortality (McFadden et al., 2017). Moreover, long-term effects are, lower blood pressure and cholesterol levels, reduced risk to develop type-2 diabetes, obesity and overweight and higher performance on intelligence test (Horta, Bernando, & Victoria, Cesar, 2013; McFadden et al., 2017). However, an additional study undertaken by Victoria et al. (2016) claim no evidence in reduced blood pressure and cholesterol levels.

Breast milk is perfectly adapted nutritional substance and personalised medicine for the infant (Victoria et al., 2016). The first milk, called colostrum, is produced by the mother from birth until about three days postpartum. Colostrum is a unique and important bioactive substance and has nutritional, immunologic and developmental functions for the infant (Champeny et al., 2019).

1.2 Determinants of breastfeeding

1.2.1 Support

Rollins et al. (2016) emphasise the importance of support and feeding decisions from health-care providers before and after birth. The first days of life affects breastfeeding at six months. Inadequate or lack of support is common reasons for abandoning breastfeeding (Forster et al., 2015). Moreover, Swedish Society of Obstetrics and Gynaecology (SFOG, 2016) explain the midwife's important work concerning breastfeeding. All prospective parents should be offered educational material regarding the benefits of breastfeeding, to inform their decision. The midwife should have a non-judgemental approach towards the mother/parents. Focus must lie on supporting parents during the first meeting with the infant, the nine instinctive stages of breastfeeding, and safe uninterrupted skin-to-skin contact.

1.2.2 Skin-to-skin

Early skin-to-skin contact right after birth has beneficial effects on breastfeeding, such as increasing the duration and the success rate of the first lactation (Karimi, Sadeghi, Maleki-Saghooni, & Khadivzadeh, 2019). The initial two hours after birth is a crucial period of establishing breastfeeding and its continuation. During this period the infant starts rooting, latching and sucking (Forster et al, 2015). Moreover, the infant responds to touch, smell and heat from the mother's body (Frie, Bartocci, Kuhn & 2019). Exclusively breastfed infants during hospital stay are more likely to continue to have breast milk at six months (Forster et al, 2015).

1.3 Risk factors causing breastfeeding problems

Known risk factors for causing breastfeeding problems are maternal anxiety, previous negative breastfeeding experience, mothers with flat inverted nipples, breast surgery, multiple birth, premature infant, medical conditions that affect the infant's ability to breastfeed, maternal illness, assisted delivery and long hospital stay (Rollins et al, 2016). Furthermore, studies have shown that infants born by caesarean section have increased odds for supplement feeding compared to those born vaginally (Boban & Zakarija-Grković, 2016; Champeny et al, 2019; Grassley, Schleis, Bennett, Chapman, & Lind, 2014; Pierro, Abulaimoun, Roth, & Blau, 2016). Mothers who are separated from their infants should get the opportunity of early hand expression of breastmilk. Early hand expression gives the infant opportunity to be supplemented by the mother’s own breast milk (Wackernagel et al., 2017). Providing anything other than breast milk to an infant during the first days of life has been argued to be associated with delayed initiation of breastfeeding (Grassley et al., 2014).

1.4 Breastfeeding and its stigma

When breastfeeding problems or difficulties occur mothers experience loneliness and a bewildering feeling towards motherhood. The image of oneself as a mother is weakened and leads to feelings of failure (Palmér, Carlsson, Mollberg, & Nyström, 2012). Furthermore, there is an ambivalence regarding meeting the infant's needs, one's own needs and the social pressure and expectations. Reasons for abandoning breastfeeding and starting with formula are different and individual. Mothers reports that the interaction with their child between and after meals are affected and that breastfeeding take all their time and leave them with no energy (Hvatum, & Glavin, 2017). Bresnahan et al. (2020) differentiate between mothers who were not able to breastfeed and those who chose not to breastfeed with regards to their own feelings of stigma. Mothers who chose not to breastfeed reported little stigma in comparison to mothers who weren't able to breastfeed.

1.5 Hypoglycaemia

Primary ambition is to prevent hypoglycaemia by encouraging breastfeeding within the first hour after birth, as well as skin-to-skin contact (Hegarty, Harding, Crowther, Brown & Alsweiler, 2017; Moore, Anderson, Bergman & Dowswel, 2012). To improve breastfeeding infants should be breastfed when necessary, not be given pacifier within the first days and have free access to the breast. If supplement feeding is required, feeding cup should be used ahead of bottle feeding (Jaafar, Ho & Lee, 2016; Wackernagel et al., 2017).

Neonatal hypoglycaemia is a common condition and defined as a plasma glucose level less than 2,6 mmol/L (Wackernagel et al., 2017). New-born infants with hypoglycaemia are unable to maintain an adequate circulating concentration of glucose, to use an alternate fuel to supply the body's organs, and/or to adapt to enteral nutrition. In this case treatment with intravenous glucose, dextrose gel or supplement feeding is necessary (Hegarty et al., 2017). Svenska Neonatalföreningen (2017) created a new flowchart for treating neonatal hypoglycaemia. As a consequence, when supplement feeding is necessary, it leads to separation between the infant and mother resulting in further related side effects (Hegarty et al., 2017).

1.5.1 Symptoms of hypoglycaemia

General symptoms, such as weak suction, hypothermia and jitteriness may be initial clinical symptoms. Symptoms are sometimes subtle as long as the infant has access to alternative energy sources. If these sources cease to exist unspecific symptoms appear. Without treatment, the infant will develop clinical symptoms as reduced consciousness and neonatal seizures. Treatment must be initiated immediately after symptom debut to avoid severe damage (Wackernagel et al., 2017).

1.5.2 Neonatal risk factors for hypoglycaemia

There are both neonatal and maternal risk factors of hypoglycaemia (Wackernagel et al., 2017). In connection with birth a very important metabolic adaptation is initiated. Healthy full-term infants undergo this transition without problems and it is of matter to not interrupt this adaptation. However, some infants may have difficulties to adapt (Harris, Weston & Harding, 2012). Infants at risk are, premature born <37 weeks, small for gestational age (SGA), large gestational age (LGA), perinatal asphyxia, hypothermia, respiratory disorder, sepsis, polycythaemia, late lactation start, diabetic fetopathy and congenital metabolic or endocrine disease (Wackernagel et al., 2017).

1.5.3 Maternal risk factors for hypoglycaemia

In the group of infants with maternal or neonatal risk factors, every other infant develops low blood sugar levels after birth. It is important to identify maternal risk factors to prevent hypoglycaemia in these infants (Harris et al., 2012). Maternal diabetes or glucose disorder during pregnancy, preeclampsia and maternal hypertension, previous pregnancy with LGA, treatment with antidepressants, treatment with tocolytics, treatment with beta blockers and drug abuse are such risk factors (Wackernagel et al., 2017).

Due to increasing Body Mass Index (BMI) for women in reproductive age, overweight and obesity will affect the pregnancy and increase the risk of complications. In addition, the risk of the infant being LGA increases, which in turn increases the risk for hyperglycaemia treated with supplement feeding (Hegarty et al., 2017; Wang et al., 2017; Harris et al., 2012). According to Wang et al. (2017) overweight and obese pregnant women are twice as likely to develop gestational diabetes mellitus (GDM). GDM itself has a negative effect on pregnancy such as preeclampsia, LGA and caesarean section. Elevated blood glucose level of the mother exposes the infant to high blood glucose level, which leads to fetal insulin production. This hyperinsulinemia persists in the infant during the first days after birth, the infant will gradually adjust the insulin production and glucose levels will stabilise (Wackernagel et al., 2017).

1.6 Supplement feeding

The WHO (2009) published acceptable medical reasons for temporary or long-term use of breast milk substitutes. Nevertheless, there are a few possible health conditions for the infant or mother that may justify recommendations for not breastfeeding. Furthermore, the WHO clarifies, when this situation occurs the benefits of breastfeeding should be weighed against the risk of the specific condition. However, supplement formula is not recommended to be given to infants unless there is a

medical indication. Supplement formula can inhibit or delay the establishment of maternal milk supply and have negative effects regarding lacto genesis and connection between mother and infant (Holmes, Mcleod, & Bunik, 2013). Socialstyrelsens föreskrifter och allmänna råd om information som avser uppfödning genom amning eller med modersmjölksersättning (2008) have regulations and general advice regarding information relating to how an infant is fed, either through breastfeeding or supplement feeding. Supplement formula should only be given to an infant after it has been assessed that such need exists. The assessment needs to be documented in the infant's and the mother's medical records. Furthermore, the organisation declare how parents should be informed about the benefits of breastfeeding compared to supplement formula, the nutritional needs of nursing mothers and how to maintain breastfeeding, the negative impact that partial breastfeeding can cause, and difficulties of changing to breastfeeding after supplement feeding. In addition, if the infant is nourished with supplement, applicable information should be provided. Information should include directions on how supplement formula is properly used, how to strengthen the bonding between mother and infant, the health risks associated with unsuitable food, and health risks associated with improper use.

Statistics from Socialstyrelsen (2017) show that exclusive breastfeeding decreased with 13 percent over a time period of seven years. At Huddinge hospital 67,8 percent were exclusively breastfeeding and 27,3 percent were partly breastfeeding at discharge, which was the second highest numbers in the nation (Graviditetsregistret, 2018). Graviditetsregistret collects and process data from pregnancy, delivery and follow-up. Data from Graviditetsregistret is standardised from electronic medical records and cover 92 percent of all pregnant women. Graviditetsregistret has also generated statistics for supplement feeding for full-term born and normal size for pregnancy length to mothers without diabetes in Sweden. The average of supplement feeding was 31,1 percent with a dissipation of 19,6 percent to 40,2 percent. Huddinge hospital reported a number of 38,3 percent. Clinics with a fall-out of records with more than 20 percent were not reported.

1.6.1 Marketing of supplement feeding

The supplement formula market is growing, and the availability of supplement feeding has been seen to increase overall bottle-feeding. Media plays an important role as a source of information and therefore impacts individuals in their decisions regarding breastfeeding. By marketing supplement formula to be as good as breast milk or that supplement formula can comfort fussy infants, the arguments of health and economic consequences are not considered (Rollins et al, 2016). McFadden, Kenney-Muir, Witford, and Renfrew (2015) wrote a report for Save the Children and clarified successful evidence for improving breastfeeding. One measure was legislation to enact on

the marketing of supplement formula and create a supportive environment in maternal health care clinics and maternity wards. Further described evidence was development of national breastfeeding politics and strategies that prevent, protect, and support breastfeeding to improve health of the nation.

1.6.2 Acceptable medical reasons for supplement feeding according to WHO

The WHO (2009) distinguished causes for medical indications between the infant's condition and the mother's condition. In many cases, breastfeeding is the best option. However, some infants may need supplement formula for a period of time, such as infants born with low birth weight, less than gestational week 32 or infants who are at risk of hypoglycaemia. Furthermore, some infants should only receive specialised supplement formula and not be breastfed. It concerns infants with classic galactosaemia, maple syrup urine disease or phenylketonuria. Maternal conditions that may require supplement feeding or avoidance of breastfeeding are mothers with HIV infection, severe illness, herpes simplex virus type 1 or maternal medication that can harm the infant. Based on recommendations regarding supplement feeding of healthy full-term infants Boban and Zakarija-Grković (2016) describe that only 24,6 percent of infants were supplemented for medical indication. In contrast 75,4 percent were given supplement formula for non-medical reasons.

Previous studies have investigated reasons for feeding healthy new-borns with supplement formula. Studies found that maternal anxiety, inadequate milk supply, hypoglycaemia, neonatal weight loss, sleepy infant, to be born during night and hospital stay for more than 24 hours were reasons for supplement feeding (Boban & Zakarija-Grković, 2016; Champeny et al, 2019; Grassley et al., 2014; Pierro et al., 2016). Lack of milk supply was the most reported reason in three of the studies (Boban & Zakarija-Grković, 2016; Champeny et al, 2019; Pierro et al., 2016). Consequently, inadequate milk production is often related to infrequent breast stimulation and emptying. This illustrates the importance of educating mothers on milk supply, milk production and infant needs during the first weeks of life (Pierro et al., 2016).

1.7 Problem definition

In spite of the positive effects of breastfeeding there is a decreasing trend of exclusively breastfed infants in the area of Stockholm according to Socialstyrelsen (2017). Between 2010 and 2017 exclusively breastfed infants at the age of one week decreased by 13 percent. As it is known that supplemental feeding in early phases after birth can interfere with breastfeeding, there is a need to assess and monitor the reasons why additional feeding was given to the infants. Besides, it urges to

analyse if there is any association between feeding practice at discharge, such as exclusive or partial breastfeeding, and supplement feeding given by medical or non-medical reason.

2. Objective

The primary objective was to investigate medical and non-medical reasons for supplement feeding at the maternity ward. Our secondary objective was to compare:

- maternal, obstetric and infant characteristics between the supplement feeding groups
- breastfeeding frequency at discharge between the supplement feeding groups

3. Methods

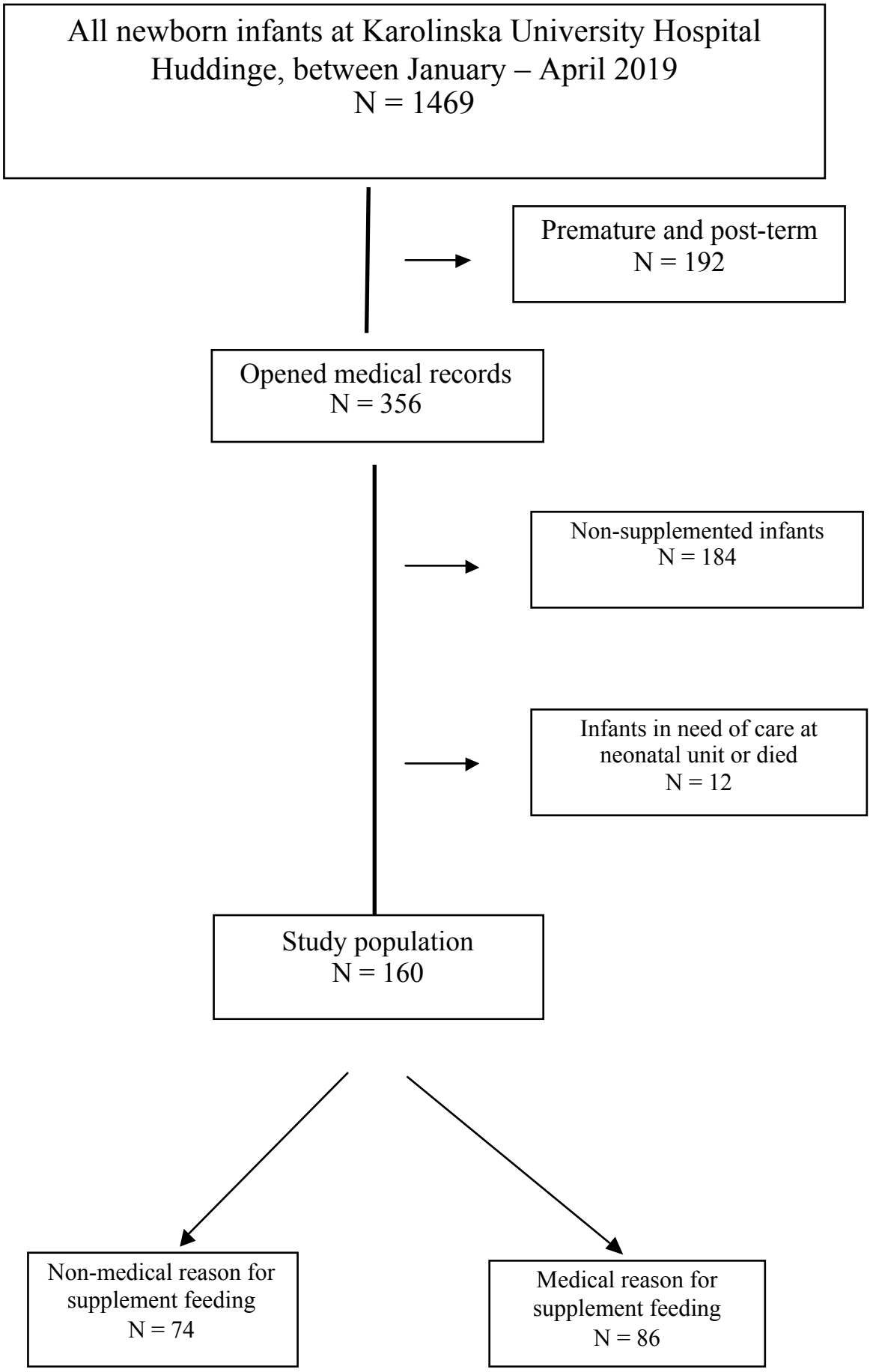
3.1 Study design

This study was a retrospective medical record review of mothers and their infants born at Karolinska University Hospital, Huddinge. In line with quantitative approach (Polit & Beck, 2017), two groups were compared: medical and non-medical reason for supplement feeding, to see if there were statistical differences regarding breastfeeding at discharge, while searching for confounding variables.

3.2 Study group

Total number of infants born between the period January and April 2019 were 1469 at Huddinge Hospital. The total number of full-term born infants was 1274. Premature and post term infants were excluded (n=192). To be able to gather enough data within the given time frame 160 predefined records of full-term infants who were supplemented with formula were collected.
To accomplish 160 medical records, totally 356 medical records were reviewed, whereof 12 infants were in need of care at the neonatal unit or died. Remaining 184 medical records were non-supplemented infants, figure (1).

To answer the aim of this study, exclusion criteria were adapted. Infants born <37+0 and >41+6, infants who were exclusively supplemented with breast milk by cup or bottle, infants who were hospitalised at neonatal care unit and infants who died during postpartum period were excluded, figure (1). From each month 40 infants were collected, with an equal split of boys and girls to avoid unequal groups. If the infant was fed with supplement formula but the reason was missing in the medical record, the infant was still included.



Flow chart, Figure (1)

3.3 Data collection

Data was obtained from Obstetrix. Obstetrix is a medical record system that follows the pregnancy from maternal health care, ultrasounds, delivery and postpartum care. Information such as pregnancy, birth factors and labour, neonatal outcomes and feeding practices are furthermore included in the record system.

Reports were retrieved from Obstetrix containing personal identity number on all mothers who had given birth during January and April 2019. The reports were divided in two groups: boys and girls for each month, further sorted by the age of the mother. Groups by decade of the mother's age were created and one medical record from each decade was collected in order to achieve age variance amongst the mothers. Two researchers reviewed the medical records over a time period of five days. All data from medical records was collected in sheets in Excel.

The medical record of an infant in Obstetrix obtains an observation list where the midwife is obliged to document time and how the infant was given supplement. If the infant was supplemented with formula the medical record was included and chosen variables were collected. Socio-demographic background variables were collected from FV2, a sheet in Obstetrix for the new-born infant, including gender, parity, gestational age and birth weight. Parity was specified in 1, 2 or ≥3. Gestational age was defined in advance to include only full-term infant. Infants were sorted in age of week 37 - 41. Documentation in FV2 occurs either through free text or filled in default boxes. Furthermore, at discharge the midwife document separate specific reports of the infant and mother, either in free text or filled in default boxes. In the report of the infant current default boxes were "Breastfeeding" - "Not specified", "No", "Partly" or "Exclusive". Also "Supplement feeding" - "Not specified", "No" or "Yes". In the report of the mother current default boxes were "Breastfeeding" - "Not specified, "Exclusive", "Partly", "No" and combine/not combine with "Breast pumping". The researchers were also required to review free text in the medical record due to lack of documentation. Missing variables were named "no information" in the data collection. When it occurred no information of who initiated supplement formula and when or why supplement formula was given the infant appertained to non-medical reason group, since there was no indication in the medical record that the infant was given supplement by a medical reason. Data was collected from the first time the infant was supplemented, even if the infant was supplemented for another reason later during hospital stay in the postpartum period.

Causes for supplement feeding was categorised in two groups, medical reason and non-medical reason. To objectively determine medical reasons for supplement feeding and risk factors for

hypoglycaemia guidelines were used Karolinska University Hospital, 2017; Wackernagel et al., 2017; WHO, 2009). Risk factors were divided into two groups; maternal condition or infant condition. Non-medical reasons for supplement feeding were registered from free text in the medical record. Each non-medical reason created a new variable and when reasons were similar they were collected in the same variable.

3.3.1 Definitions

Table (1)

Full-term infant	Infant born week ≥37+0 and ≤41+6.
Supplement feeding	Formula milk given by bottle or cup. Supplement can be given in addition to breastfeeding and instead of breastfeeding.
Breastfeeding	Infant who only receive breast milk fed by the breast. No breast milk by bottle or cup. No other liquids or solids are given, except oral rehydration solution, drops of vitamins, minerals or medicines.
Instrumental vaginal delivery	Vaginal delivery of a baby performed with the help of forceps, vacuum or other devices to extract the infant from the vagina.

3.3.2 Variables

Data was categorised on nominal scale and included binary and categorical variables. Nominal scale involves using numbers to categorise attributes (Polit & Beck, 2017). The variables are presented in table (2).

Table (2)

Maternal and neonatal risk factors for hypoglycaemia	Predefined from Nationellt vårdprogram - Neonatal hypoglykemi hos nyfödda med gestationsålder >35 veckor (Wackernagel et al., 2017). When statistical tests were done risk factor were categorised "yes" and "no", maternal and neonatal risk factor separately
Delivery mode	Categorised as "vaginal delivery", "instrumental vaginal delivery", "elective caesarean section" or "emergency caesarean section". Delivery mode was grouped in statistical test as "vaginal delivery" and "instrumental/caesarean section", including both elective and emergency
Time of birth	Categorised as "day" (07:00-13:59), "evening" (14:00-20:59) and "night" (21:00-06:59)
Mothers intention to breastfeed	Categorised as "wish to breastfeed", "wish to partly breastfeed", "wish not to breastfeed" and "no information". Information regarding intention to breastfeed is generally documented in the maternity record, where the researchers had no access and therefore the information was deficient
Breastfed within two hours	Categorised as "yes", "no", "no information". Information about breastfeeding or sucking within 2 hours was taken from one specific search word "efterskötning" from free text in the medical record. If the researcher were unable to find "efterskötning" or no other note excited that the infant had breastfed within 2 hours, it was classified as "No information". Trying to suck was classified as "no"
Time for first supplement feeding	Categorised as "day" (07:00-13:59), "evening" (14:00-20:59), "night" (21:00-06:59) and "no information"
Infant age at first supplement	Categorised as "2 hours", "2-24 hours", "≥25 hours" and "no information"
Who initiated supplement feeding	Categorised as "doctor", "midwife's initiative", "midwife's general ordination", "mother" and "no information"
Length of stay	Categorised as "6-12 hours", "13-24 hours", "25-48 hours", "49-72 hours" and ">72 hours"
Feeding practice at discharge	Categorised as "exclusive breastfeeding", "partly breastfeeding", "supplement feeding", and "bottle feeding with mothers' own breast milk"

3.4 Bias

Bias is a concern in research because its potential impact to influence a study in an inaccurate way. Researchers may therefore explain the process and adopt strategies to address bias. When interpreting the result, it is important to minimise or eliminate bias or at least to detect its presence (Polit & Beck, 2017).

A potential risk of bias was detected during data collection. When data is taken from medical records there is a risk that the data is incomplete and additional conclusion or interpretation errors might occur (Billhult, 2017). To reduce the risk of additional conclusions and avoid subjective bias the researchers reviewed all medical records together. Data was inserted in Excel and double-checked by both researchers before the next medical record was reviewed. In addition, to reduce errors during data collection definitions were applied by using "VLOOKUP" in Excel, hence the possibility to indicate that the right number was inserted. When information was missing it was declared as "no information" to reduce the risk to exclude findings and reporting bias (Statens beredning för medicinsk utvärdering [SBU], 2015). Furthermore, to reduce reporting bias the researchers had predefined to choose the first reason for supplement feeding regardless if risk factors existed and should have been supplemented according to guidelines (Karolinska University Hospital, 2017; Wackernagel et al., 2017; WHO, 2009). Guidelines were further used when categorising medical indications for supplement feeding to reduce the risk of subjective bias. However, WHO's medical reasons for supplement feeding creates space for interpretation since they are meant to be applied globally.

Exclusion criteria were applied which minimises the risk of the study results not reflecting the intention of the study. By applying the exclusion criteria validity and reliability were increased (Polit & Beck, 2017). Furthermore, to gain internal validity data was checked using statistical analysis. Through reporting statistical results, the study indicates transparency which results in higher validity. With regard to the study selection at Karolinska University Hospital, Huddinge the results are not generalisable in a context of the nation since statistics might differ between maternity wards.

All medical records were de-identified during the data collection and the personal identity number was replaced with study numbers. To be able to deduce the medical records if errors were to occur during data collection the collected reports were saved in a safe locker during the time of the study.

3.5 Statistical analyses

The statistical analyses were carried out using SPSS version 26. The program was provided for students at Karolinska Institute for nursing- and medical research.

3.5.1 Descriptive statistics

To answer the current objective the researchers used descriptive statistics. Descriptive analysis is of value in conveying statistics, summarises and creates an overview (Billhult, 2017). The quantitative data in this study focused on the prevalence, incidence, size and measurable attributes. The variables were compared to search for correlations without attempting to interfere causal connections (Polit & Beck, 2017).

3.5.2 Chi-squared test

To describe differences in proportions and investigate possible association between groups a chi-squared test was carried out (Polit & Beck, 2017). To conduct chi-square test, variables with frequency less than five were grouped in line with adequate expected cell counts (Hess & Hess, 2017). Grouped variables are described in table (2). The chi-square test sums up the differences between the observed variables and the expected frequency. The variables were on nominal scale and classified into mutually exclusive groups. A P value $< .05$ was considered statistically significant. Variables with "No information" were removed at the statistical analysis.

4. Ethical considerations

According to Karolinska Institute (2019) ethical approval is not required when degree projects are done at undergraduate and advanced levels. However, researchers carry a great responsibility towards the individuals involved in the study and should therefore ensure good ethical compliance. The current study received approval from the Head of pregnancy and delivery unit to open and review medical records in Obstetrix between January - April 2019.

All personal data within this study was handled in accordance with *Patientdatalagen* (SFS, 2008:355). Medical records were de-identified with no possibility to track particular individuals. Reports with personal identity information were kept secure and not accessible to unauthorised individuals. Data was not spread or shown to anyone except the researchers, in order not to jeopardise the integrity of individuals. Data was handled with respect and had focus on moral principles as Autonomy, Beneficence and Justice. To reduce the risk of potential harm or offend

anyone, data was analysed with reliable data analysis methods to reduce risk of an incorrect outcome potentially causing harm (Vetenskapsrådet, 2017).

5. Results

This study included 160 full-term infants who were supplemented with formula. Reasons for supplement feeding was divided into two groups, 54 percent (n 86/160) supplemented by medical reason and 46 percent (n 74/160) by non-medical reason. In the total amount, most of the infants' 67 percent (107/160) were breastfed partly at discharge, the medical reason group had the lowest amount 16 percent (n 19/86) of exclusive breastfeeding at discharge, table (3).

Additional variables included in the study are presented in frequencies and percent, listed in table (3).

Table (3)
Descriptive characteristic of the total study sample.
Total sample reported via frequencies and percentages (%)

	Total n=160 (%)
Gestational age	
Week 37	14 (9)
Week 38	32 (20)
Week 39	49 (31)
Week 40	42 (26)
Week 41	23 (14)
Parity	
1-para	46 (29)
2-para	57 (36)
>3-para	57 (36)
Gender of infant	
Girl	80 (50)
Boy	80 (50)
Maternal risk factors for hypoglycemia	
Yes	45 (28)
No	115 (72)
Neonatal risk factors for hypoglycemia	
Yes	37 (23)
No	123 (77)
Delivery mode	
Vaginally	96 (60)
Instrumental/caesarean section*	64 (40)
Time of birth	
Day	53 (33)
Evening	39 (24)
Night	68 (43)
Mother's intention towards breastfeeding	
Wish to breastfeed	25 (16)
Wish not to breastfeed	6 (4)
Wish to partly breastfeed	7 (4)
No information	122 (76)
Breastfed within 2 hours	
Yes	87 (54)
No	54 (34)
No information	19 (12)
Time for first supplement	
Day	42 (26)
Evening	42 (26)
Night	68 (43)
No information	8 (5)
Infant age for first supplement	
<2 h	40 (25)
2-24 h	70 (44)
≥25 h	42 (26)
No information	8 (5)
Who initiated supplement feeding	
Doctor	21 (13)
Midwife**	73 (46)
Mother	50 (31)
No information	16 (10)
Length of stay	
≤24 h	4 (3)
25-48 h	46 (29)
≥49 h	110 (69)
Feeding practice at discharge	
Exlusive breastfeeding***	40 (25)
Partly breastfeeding	107 (67)
Supplement feeding	13 (8)

Percentages (%) are presented in columns and rounded to integers
*Both elective and emergency caesarean section
**Both midwife's own initiative and general ordination according to hospital guidelines (Karolinska University Hospital, 2017)
***Includes one bottle fed infant

5.1 Reasons for supplement feeding

The most common reported non-medical reason for supplement feeding was “fussy infant” which was registered in 23 percent (n 17/74) of the medical records, figure (2). The most reported medical reason was “risk for hypoglycaemia”. It occurred in 88 percent (n 76/86) of all medical records, figure (3).

In 16 cases infants had received supplement formula without any reason documented in the medical record. Among those, the mother had initiated supplement feeding in six cases, doctor in three and in the remaining seven there was no information who prescribed supplement formula.

5.1.1 Non-medical reasons for supplement feeding

The mother initiated supplement feeding in 10 cases because of “fussy infant”. Among the total 74/160 reported non-medical reasons the mother initiated supplement feeding in 68 percent (n 50/74) of the times. The midwife initiated 14 percent (n 10/74) of non-medical supplement feeding. Doctor initiated supplement by non-medical reason in one percent (n 1/74). The remaining 17 percent (n 13/74) were supplemented by non-medical reason but there was no information about who initiated supplement feeding.

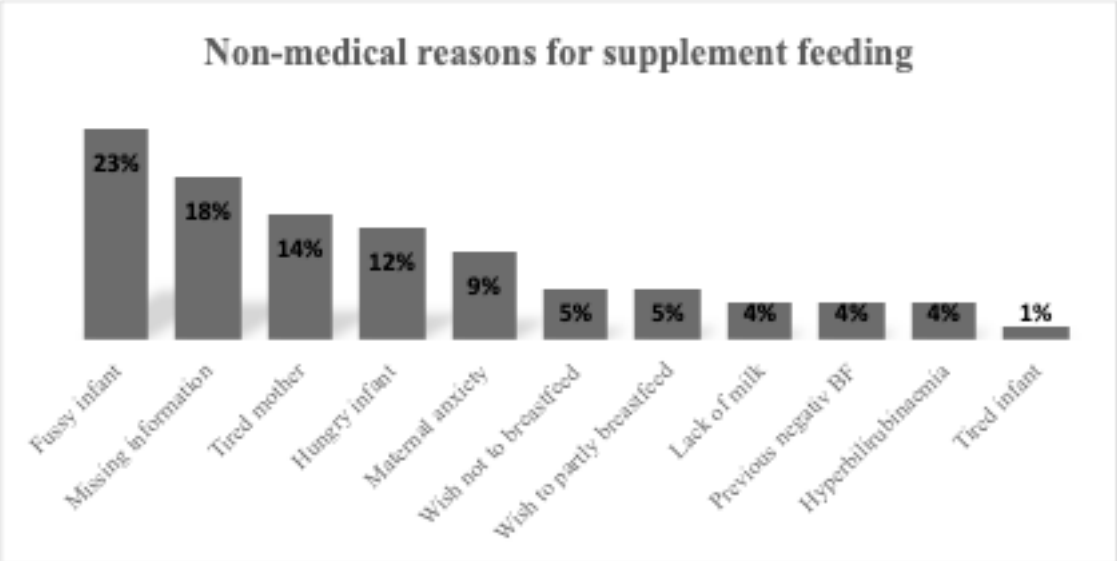


Figure (2)
Distribution of non-medical reasons for supplement feeding, 46 percent (n 74/160).
BF: breastfeeding

5.1.2 Medical reasons for supplement feeding

The midwife initiated supplement feeding in 67 percent (n 58/86) on medical reason due to neonatal risk of hypoglycaemia. Among those, 71 percent (n 61/86) had either a maternal risk factor, neonatal risk factor or both risk factors for hypoglycaemia, table (4). Within the medical reasons for supplement feeding "risk of hypoglycaemia" several underlying causes existed. These were, small for gestational age (SGA), large for gestational age (LGA), perinatal asphyxia, hypothermia, maternal diabetes or glucose disorder and preeclampsia or maternal hypertension. In 18 medical records infants had been supplemented due to small for gestational age (SGA) according to general guidelines from Karolinska University Hospital (2017). Furthermore, seven of the eight infants with LGA were supplemented for medical reason according to general guidelines from Karolinska University Hospital, three of them had mothers with gestational diabetes or other glucose disorder. The remaining five infants with LGA had no other risk factor described in the medical record. There were five infants who were exposed to hypothermia and three to perinatal asphyxia. Among all, 33 infants out of the total sample group had the maternal risk factor diabetes or glucose disorder. All 33 infants were supplemented by medical reason. Additional, four mothers had preeclampsia or maternal hypertension and all of their infants had own risk factors for hypoglycaemia.

As shown in figure (3), three percent of the infants (n 3/86) were supplemented by medical reason but no reason for supplement was documented. In those cases, a doctor had initiated supplement feeding in all three records.

Table (4)
Distribution of risk factors and reason for supplement feeding.

	Supplement feeding on medical indication (N=86)	**Supplement feeding on non-medical indication (N=74)**	**Total (N=160)**
Maternal risk factor for hypoglykemia	28 (33)	7 (9,4)	35 (22)
Neonatal risk factor for hypoglykemia	24 (28)	3 (4,1)	27 (17)
Neonatal and maternal risk factor for hypoglykemia	9 (10)	1 (1,4)	10 (6)
No risk factor	25 (29)	63 (85,1)	88 (55)

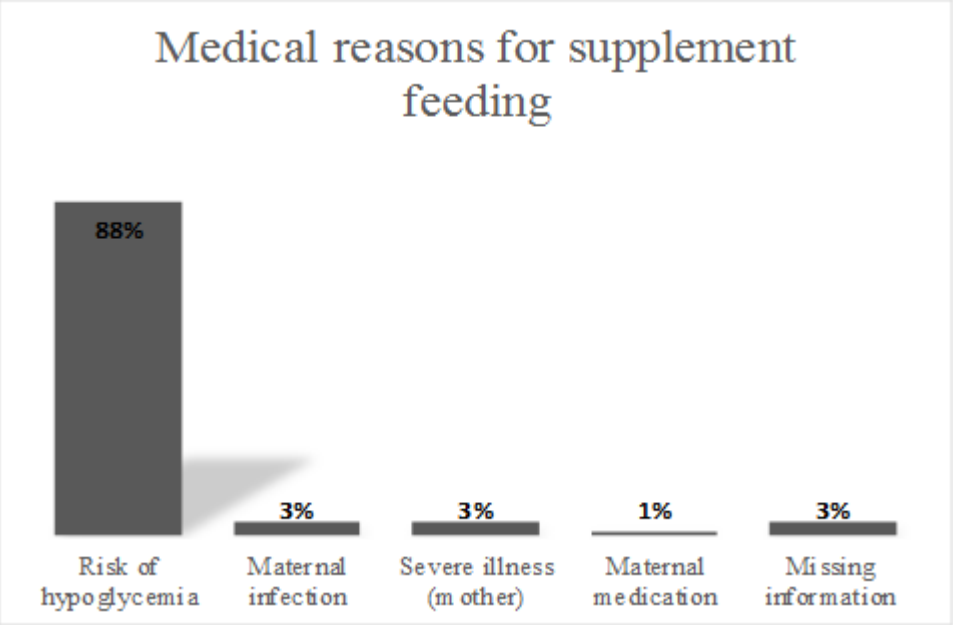


Figure (3)
Distribution of medical reasons for supplement feeding

5.2 Comparison of study characteristics between medical and non-medical reasons for supplement

Characteristics of the study samples were compared with medical and non-medical reasons to further understand differences between the groups, shown in table (5). The percent in table (5) is presented in columns, medical and non-medical reason separated.

In the group of infants who had a neonatal risk factor 89 percent were supplemented by a medical reason. Among infants who had a maternal risk factor for hypoglycaemia 82 percent were supplemented by medical reason compared with 18 percent who was supplemented by non-medical reason. As shown in table (5), there was a statistical significance between the groups.

The category, infant age for first supplement showed a statistical significance. Of those who were supplemented within two hours the majority (97 percent) were supplemented due to medical reason. The infants supplemented at ≥25 hours of age, 79 percent were supplemented by non-medical reason compared with 21 percent who were supplemented by medical reason.

As shown in table (5) the chi-square test demonstrates that there was a statistical significance difference between who initiated supplement feeding and medical and non-medical reason. When the doctor initiated supplement feeding it was 95 percent on medical reason. Furthermore, when the midwife initiated supplement feeding it was 86 percent on medical indication compared with 14 percent on non-medical indication.

Table (5)

Descriptive characteristics of the total study sample and comparison of medical or non-medical reason for supplement feeding.
Medical, non-medical reasons and total sample reported via frequencies, total sample (and percent), with chi-square test.

	Supplement feeding for medical reason n=86 (%)	Supplement feeding for non-medical reason n=74 (%)	Total n=160 (%)	P value
Gestational age				
Week 37	10 (12)	4 (5)	14 (9)	
Week 38	21 (24)	11 (15)	32 (20)	
Week 39	24 (28)	25 (34)	49 (31)	.22
Week 40	22 (26)	20 (27)	42 (26)	
Week 41	9 (10)	14 (19)	23 (14)	
Parity				
1-para	22 (26)	24 (32)	46 (29)	
2-para	35 (41)	22 (30)	57 (36)	.34
>3-para	29 (34)	28 (28)	57 (36)	
Gender of infant				
Girl	42 (49)	38 (51)	80 (50)	.75
Boy	44 (51)	36 (49)	80 (50)	
Maternal risk factors for hypoglycemia				
Yes	37 (43)	8 (11)	45 (28)	< .001
No	49 (57)	66 (89)	115 (72)	
Neonatal risk factors for hypoglycemia				
Yes	33 (38)	4 (5)	37 (23)	< .001
No	53 (62)	70 (95)	123 (77)	
Delivery mode				
Vaginally	54 (63)	42 (57)	96 (60)	.44
Instrumental/caesarean section*	32 (37)	32 (43)	64 (40)	
Time of birth				
Day	32 (37)	21 (28)	53 (33)	
Evening	16 (19)	23 (31)	39 (24)	.165
Night	38 (44)	30 (41)	68 (43)	
Mother's intention towards breastfeeding″				
Wish to breastfeed	12 (14)	13 (18)	25 (16)	
Wish not to breastfeed	1 (1)	5 (7)	6 (4)	.14
Wish to partly breastfeed	1 (1)	6 (8)	7 (4)	
No information			122 (76)	
Breastfed within 2 hours ″				
Yes	46 (53)	41 (55)	87 (54)	.46
No	32 (37)	22 (30)	54 (34)	
No information			19 (12)	
Time for first supplement ″				
Day	24 (28)	18 (24)	42 (26)	
Evening	26 (30)	16 (22)	42 (26)	.55
Night	35 (41)	33 (45)	68 (43)	
No information			8 (5)	
Infant age for first supplement ″				
<2 h	39 (45)	1 (1)	40 (25)	
2-24 h	37 (43)	33 (45)	70 (44)	< .001
≥25 h	9 (10)	33 (45)	42 (26)	
No information			8 (5)	
Who initiated supplement feeding ″				
Doctor	20 (23)	1 (1)	21 (13)	
Midwife**	63 (73)	10 (14)	73 (46)	< .001
Mother	-	50 (68)	50 (31)	
No information			16 (10)	
Length of stay				
≤24 h	2 (2)	2 (3)	4 (3)	
25-48 h	24 (28)	22 (30)	46 (29)	.95
≥49 h	60 (70)	50 (68)	110 (69)	
Feeding practice at discharge				
Exlusive breastfeeding***	16 (19)	24 (32)	40 (25)	
Partly breastfeeding	64 (74)	43 (58)	107 (67)	.085
Supplement feeding	6 (7)	7 (9)	13 (8)	

Percent are reported in columns and rounded to integers
″ Variables with "missing information" excluded
*Both elective and emergency caesarean section
**Both midwife's own initiative and general ordination
***Bottle fed infant with breastmilk included

5.3 Feeding practice at discharge

Partly breastfeeding was the most reported way to feed infants 67 percent (n 107/160), regardless supplement feeding on medical or non-medical reason. Twenty-four percent (n 39/160) were exclusively breastfed and eight percent (n 13/160) were exclusive supplement fed. One infant was bottle fed with breast milk. There was no statistical significance between reason for supplement feeding and feeding practice at discharge, *P* value .085 (table 5).

5.3.1 Breastfed within two hours

Among the 160 included infants, 54 percent (n 87/160) were breastfed within two hours. In 12 percent (n 19/160) of the medical records no documentation was found regarding whether the infant was breastfed or not. Those were excluded in the statistical analysis. According to table (6) there was no statistical significance between feeding practice at discharge and breastfed within two hours or delivery mode.

5.3.2 Mode of delivery

As shown in table (6), of all deliveries, 60 percent (n 96/160) of the infants were born vaginal, and 40 percent (n 64/160) were born by caesarean section or instrumental vaginal delivery. The variance in "vaginal delivery" was not equal between the groups: 56 percent (n 54/96) were supplemented of medical reason and 44 percent (n 42/96) of non-medical reason. In the group of non-medical reasons for supplement feeding, 29 percent more infants were born by caesarean section compared with the group of medical reasons (table 6). In the group of medical reasons for supplement feeding, 55 percent more infants were born by instrumental delivery, compared with the group of non-medical reasons for supplement feeding.

Delivery mode and indication for supplement feeding were compared. The chi-square test showed no statistical significance between delivery mode and whether the infant was supplement fed on medical or non-medical reason, table (5).

Table (6)
Comparison between characteristics and feeding practice at discharge.

	Supplement feeding (N=13)	Partly breastfeeding (N=107)	Exclusive breastfeeding (N=40)	Total (N=160)	P Value
Breastfed within 2 hours	4 (31)	61 (65)	22 (65)	87 (62)*	.055
Not breastfed within 2 hours	9 (69)	33 (35)	12 (35)	54 (38)*	
Instrumental/caesarean secion delivery**	4 (31)	44 (41)	16 (40)	64 (40)	.772
Vaginal delivery	9 (69)	63 (59)	24 (60)	96 (60)	

*Variables with "missing information" excluded in this table.
**Both elective and emergency caesarean section.

6. Discussion

6.1 Result discussion

The current study performed a medical record review to investigate reasons for supplement feeding and to review the frequency of infant breastfeeding at discharge. The results of this study showed that almost half of the infants were supplemented due to non-medical reasons. The chi-square test indicated no association between supplement feeding due to medical or non-medical reason and feeding practices at discharge. However, the majority of infants were partly breastfed at discharge regardless of reason for supplement feeding. The most frequent reported medical reason for supplement feeding was "risk of hypoglycaemia". Furthermore, "fussy infant" was the most reported cause for non-medical supplement feeding.

Reasons for non-medical supplement feeding has been explored in various studies (Boban & Zakarija-Grković, 2016; Champeny et al, 2019; Pierro et al., 2016), which report lack of milk as the most common cause. Compared with the current study, lack of milk was not the most reported reason. However, there might be several factors for initiating supplement feeding by non-medical reasons, for example, fussy infant and lack of milk may have an impact on each other.

In the current study, 46 percent of all supplement feeding were given to infants' due to a non-medical reason. Although, several studies have shown breastfeeding was the most effective way to ensure infants' health (WHO, 2019). Studies revealed that supplement formula increased the risk of delaying or inhibiting breastfeeding, which furthermore had a negative impact on the connection between mother and infant (Holmes et al., 2013). This is further demonstrated by the midwife's important work concerning breastfeeding and to inform becoming parents about rights and benefits of breastfeeding. Breastfeeding is controversial and an issue that raises strong feelings (Palmér et

al., 2012). Whether to breastfeed or not is a woman's choice and regardless of the decision, it should be an informed choice (SFOG, 2016). The number of non-medical supplement feedings shown in the current study could be an indication of that further work needs to be done to protect, promote and support breastfeeding. According to Rollins et al. (2016) breastfeeding is not only important regarding health for women and infants, but also important for society as it contributes to equality.

Socialstyrelsens föreskrifter och allmänna råd om information som avser uppfödning genom amning eller med modersmjölksersättning (2008) have pointed out the importance of only give infants supplement feeding after it has been assessed that such need exists. Assuming that parents in the current study received relevant support and information about the positive benefits of breastfeeding and supplement feeding. If they still chose to supplement their infant, it is difficult to explain the discrepancy between the proportion of mothers who wished to breastfeed before delivery, and the amount of exclusive breastfeeding at discharge. Frequency of supplement feeding would probably decrease if the midwife were able to support and guide the new parents to a greater extent, which could be challenging considering today's workload. However, a limitation was the insufficient information pertaining to "intention to breastfeed" since this information generally is documented in the maternity record where the researchers did not have access.

The benefits of breast milk have been studied and the first produced milk called colostrum is exceptional for the infant (Champeny et al., 2019). Our findings revealed that more than half of the infants were breastfed within two hours. This contradicts the recommendations according to WHO (2017). Furthermore, WHO promotes that all mothers should be supported to initiate breastfeeding within the first hour after delivery. In the current study, assumptions can not be made whether mothers received support or not. However, the numbers of breastfed infants within two hours were surprisingly low in the current study, 54 percent. Previous studies have concluded that the first two hours after birth creates necessary conditions for breastfeeding (Forster et al, 2015). Furthermore, other studies have shown benefits of skin-to-skin contact within the first hours after birth: increased duration of breastfeeding, and advantageous impact of the first lactation (Karimi et al., 2019). Foster et al. (2015) found that exclusively breastfed infants during the hospital stay were more likely to continue to be breastfed at 6 months. However, our findings revealed that a small number of infants were exclusively breastfed at discharge. The findings showed no difference for feeding practice at discharge between infants who were breastfed within two hours and those who were not.

The underlying causes of caesarean section as delivery mode is associated with an increased risk of supplement feeding, causes can be found in both mother and infants such as, hypoxia, growth disorder and placental insufficiency (Boban & Zakarija-Grković, 2016; Champeny et al., 2019; Grassley et al., 2014; Pierro et al., 2016). Karolinska University Hospital, Huddinge showed 2018 the highest numbers of caesarean sections in the nation (Graviditetsregistret, 2018). Our findings revealed that the number of infants who were exclusively breastfed at discharge was slightly higher for those born vaginally, compared to those born by caesarean section. Although, there was no statistical significance between the groups: delivery mode and feeding practice at discharge.

Studies have shown that infants with certain risk factors have a greater risk to develop low blood sugar (Harris et al., 2012), therefore national and local guidelines are preventing this through supplement feeding. The increased overweight and BMI value for women in reproductive age have an impact on supplement feeding for infants (Harris et al., 2012; Hegarty et al., 2017; Wang et al., 2017). Our findings show that maternal risk factors represent a big part of medical reason for supplement feeding, which indicates that it affects the infant.

Wackernagel et al. (2017) explain when exceptions can be made to reduce the risk of early exposure to cow's milk formula and to promote breastfeeding: At satisfactory breastfeeding and normal glucose levels, infants with LGA whose mothers do not have maternal diabetes or glucose disorder and infants at appropriate gestational age (AGA) whose mothers have diet treated diabetes (Wackernagel et al., 2017). Our findings show, among all the infants with LGA, most infants did not have mothers with any glucose disorder. However, there were infants among them who were supplemented for medical reason because of risk for hypoglycaemia. If the medical record was fully completed, the researchers speculate that supplement feeding could potentially have been delayed. Surely several reasons exist why guidelines are not always followed regarding supplement feeding. For instance, lack of knowledge, lack of time, or difficulties to interpret the guidelines. Both alternatives can be seen as a result of shortcomings of the organisation's management.

Although, the result from the current study cannot completely be compared with statistics from Graviditetsregistret (2018) it is interesting to illuminate feeding practice at discharge. The majority of all born infants at Karolinska University Hospital, Huddinge during 2018 were exclusively breastfed at discharge compared with the result from the current study. According to our results the majority of infants were partly breastfed. This could be explained by the study sample where all infants were supplemented which is not generalisable of entire population

6.2 Method discussion

To achieve high validity, reliability and generalisability it is of value to have an appropriate study design (Polit & Beck, 2017). To answer the aim of the current study a retrospective medical record review with a quantitative approach design was used. Retrospective design is a common design when medical records are reviewed since the phenomenon being studied has already been collected. Descriptive statistics are recommended when studying a small population and when it is of interest to declare and summarise different variables (Polit & Beck, 2017).

To collect a study group of full-term supplement fed infants at the maternity ward, exclusion criteria were adapted. Defining the population's characteristics through inclusion and exclusion criteria is fundamental for achieving high validity (Polit & Beck, 2017). The exclusion criteria were, infants who were treated at a neonatal care unit, infants who died during the postpartum period, premature, and post term infants. The number of infants who fulfilled the inclusion criteria: full-term gestational age was 1274. The study group of 160 supplemented infants were predefined in line with the given timeframe. However, a larger study population might have increased the possibility of generalisation (Polit & Beck, 2017). Full-term infants who had a maternal and/or neonatal risk factor for hypoglycaemia were included in the study and might have influenced the results. In many cases infants are supplemented in prevention according to local guidelines (Karolinska University Hospital, 2017).

A potential problem was lack of documentation of the medical records that could have had an impact on the reliability of the study. First time of supplement, who initiated supplement and reason for supplement was not always clear. Supplement was not always documented in the correct place. According to Socialstyrelsens föreskrifter och allmänna råd om information som avser uppfödning genom amning eller med modersmjölksersättning (2008) supplement feeding must be documented in both the infant's and mother's medical record. Data collection was conducted in a structured data collection measurement, to minimise risk of misinterpretation. On the other hand, there is a risk of preconception and lack of information. When the variable was missing in the record, no information was used as answer. Due to the lack of documentation, there is a risk of underreporting of infants who were supplemented. To be certain of including all supplemented infants the researchers reviewed all potential parts of the medical record.

Moreover, since the medical records consisted of free text there was a risk of misinterpretation since there was the midwife's own experience of the situation. There was likely a discussion between midwife, mother and partner when considering supplement feeding and through domain knowledge

midwives are able to lead parents in the appropriate direction considering the circumstances. A disadvantage with this was that documented reasons for non-medical supplement feeding could be misleading. The researchers were aware of this potential bias and therefore reported this in the method section.

While randomised sampling may yield a more representative sample (Polit & Beck, 2017), the data was collected through non-randomised method with a retrospective design. This was a more convenient method to reassure the possibility of identifying participants and ensure enough respondents to conduct the study. Two main weaknesses of convenience sampling are, increase in the risk of bias and decreases in the studies' generalisability (Polit & Beck, 2017), which has a negative impact on the possibility of generalisability of the study. On the other hand, due to the fact that the data already was collected there was no risk of influence in the medical records. Anonymity was impossible since the reports from Obstretrix contained personal identity information. However, the reports were kept and handled in strictest confidence, in order to maintain the participants' privacy and anonymity throughout the study. The result was presenting only aggregate data for groups, with no possibility to track specific individuals or disguise a person's identity.

It would be interesting to conduct a similar study and include a control group with non-supplemented infants, to investigate if there exists a difference between supplemented or non-supplemented infants for feeding practice at discharge. This could help in understanding how supplement feeding affects breastfeeding. Further research may also explore how health care workers and midwives are able to influence the exclusively breastfeeding ratio, to increase knowledge and support to midwifes.

7. Conclusion

Findings point out that just over half of the infants were supplemented by medical reason. In the current study, the researchers could distinguish factors, which was associated to medical and non-medical supplement feeding. The most reported medical reason for supplement feeding was risk of hypoglycaemia and the most reported non-medical reason for supplement feeding was fussy infant. Characteristics that affected supplement feeding were maternal or neonatal risk factors for hypoglycaemia, who initiated supplement feeding and infant age for first supplement. It is of value to increase knowledge of characteristics that affect reasons for supplement feeding, to prevent risk factors. The study also highlighted that the majority of the infants were partly breastfed at discharge. However, there was no statistical significance found between reason for supplement

feeding and breastfeeding at discharge. The researchers of the current study consider that the frequencies of infants who are exclusively breastfeeding at discharge might possibly increase if supplement feeding at the maternity ward decreased. Of course, several background factors have impact on decreased supplement feeding, for example: the midwife's work environment, education of benefits of breastfeeding, physiology of breastfeeding, women health and living habits. The knowledge of numbers in breastfeeding and supplement feeding might have a value to further research.

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9. Attachments

9.1 Appendix (1)

Application approval for medical record review

Karolinska Institutet

Till tf Verksamhetschef

Namn: Susanne Albertsson
Verksamhet: Graviditet och förlossning omvårdnad
Sjukhus: Karolinska Universitetssjukhuset, Huddinge

Med anledning av vår magisteruppsats inom ramen för *barnmorskeprogrammet*, Karolinska Institutet vill vi härmed fråga om tillstånd för en datainsamling. Vi önskar att inhämta data från Obsetrix under perioden januari- april 2019.

För mer information om studien se bifogad sammanfattning av projektplan. Vi svarar gärna på eventuella frågor via telefon eller mail. Var vänlig returnera undertecknat blad via mail alternativt att vi hämtar intyget på plats.

Vänlig hälsning

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Handledare: Emilija Wilson, Leg.barnmorska, PhD

Bihandledare: Anna Gustafsson, Specialistbarnmorska; Medicinsk enhet för neonatologi, Karolinska Universitetssjukhuset

Jag godkänner härmed att data inhämtas enligt den plan som jag tagit del av

Stockholm 200204
Ort, datum

Namnteckning, Verksamhetschef/ Patientområdeschef

Susanne Albertsson
Namnförtydligande

9.2 Appendix (2)

Application approval for medical record review

Till Biträdande Verksamhetschef

Namn: Clara Brandkvist
Verksamhet: Graviditet och förlossning
Sjukhus: Karolinska Universitetssjukhuset, Huddinge

Med anledning av vår magisteruppsats inom ramen för *barnmorskeprogrammet*, Karolinska Institutet vill vi härmed fråga om tillstånd för en datainsamling. Vi önskar att inhämta data från Obsetrix under perioden januari-april 2019.

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Vänlig hälsning

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