



## Timing of Colostrum Expulsion Based on Type of Labor in Fourth Period Laboring Mothers

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### ABSTRACT

Colostrum is the best food and is an antibody for babies. Breast milk is a nutritional requirement for newborns, colostrum is yellow, low in fat but high in carbohydrates, protein and especially antibody content. This study aims to determine the relationship between the type of delivery and colostrum excretion in women in the fourth stage of labor. This type of research is a quantitative study using observational analytic methods. The population in this study were all mothers giving birth in the fourth stage at EMC Pulomas Hospital as many as 80 respondents. The statistical test uses the chi-square test. There is a significant relationship between the type of delivery and the time the colostrum comes out at the EMC Pulomas Hospital, Jakarta. evident from the value of  $p = 0.002$ . There is a significant relationship between the type of delivery and the time colostrum is released at EMC Pulomas Hospital, Jakarta, so it is necessary to provide counseling on types of delivery and its side effects.

**Keywords:** *Colostrum, Discharge, Type of Delivery*

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## INTRODUCTION

Breastfeeding is the optimal way to provide nutritional and immunological needs to newborns. Breast milk contains all the ingredients a baby needs, is easily digested, provides protection against infection, is always fresh and clean and ready to drink. Given the importance of breast milk, especially day I from day one to day four is colostrum. Colostrum is very important for the baby's defense because colostrum is the first immunization for the baby. Colostrum helps remove meconium from the baby's intestines so that the newborn's intestinal mucosa is clean and ready to receive breast milk. Colostrum begins to be produced by the body during pregnancy, and colostrum is

released at the beginning of a mother's breastfeeding period (Abuelo dkk., 2019; De Moura Bell dkk., 2018; Derakhshani dkk., 2018)

Colostrum is the best food and antibody for babies. Breast milk is the nutritional needs of newborns, colostrum is yellow in color, low in fat but high in carbohydrates, protein and especially antibody content. Mothers who experienced stress during pregnancy and childbirth experienced delayed colostrum discharge (>72 hours) postpartum. Other factors that contribute to the slow discharge of colostrum are the type of labor, length of labor, and fatigue after labor. Other factors that also affect the amount of colostrum is the nutritional status of the mother, breast care, infant suction immediately after birth, maternal obesity and drug factors. According to (Arslan dkk., 2021; Juhl dkk., 2018; Playford & Weiser, 2021) There are several factors that influence breastfeeding, namely the influence of mass media, education level, attitude, family support, parity and maternal knowledge.

The provision of colostrum and breast milk to infants needs to be increased immediately after birth until 6 months of age. The composition of breast milk is most suitable for infant growth and also contains protective substances and the most content in colostrum. Colostrum is yellowish breast milk produced on the first day after delivery and should be given as early as possible after the baby is born. Colostrum contains immunoglobins, namely secretory IgA (SigA), IgE, IgM, and IgG.

Of all these immunoglobulins, the largest is IgA which is not absorbed but can paralyze pathogenic bacteria *E coli* and various viruses in the digestive tract. Antibodies in breast milk can survive in the baby's digestive tract because they are resistant to acids and proteolytic enzymes of the digestive tract and create a layer on the mucosa that prevents pathogenic bacteria and enteroviruses from entering the intestinal mucosa. To increase milk production and milk ejection, breast care is carried out by massaging the nape and massaging the pectoralis major muscle.

The Strategic Plan (2019) states that one of the indicators of achieving the target of community nutrition improvement is the presentation of newborns receiving colostrum through early breastfeeding initiation (IMD). Kepmenkes number 450/Menkes/SK/IV/2004 states that one of the 10 steps towards successful breastfeeding is to help mothers breastfeed their babies within 30 minutes after delivery, which is done in the delivery room. If the mother has a caesarean section, the baby is breastfed 30 minutes after the mother regains consciousness.

The number of breastfeeding mothers in Indonesia is decreasing even though exclusive breastfeeding has many advantages. Mothers in Indonesia tend to choose to give formula milk to their babies. This behavior has developed into a prestige for some mothers. This wrong behavior is imitated by mothers from less affluent families. As a result, mothers from less affluent families give formula milk that is very diluted and does not meet the nutritional needs of the baby (Cao dkk., 2018; Li dkk., 2020; Liu dkk., 2020; Song dkk., 2019). According to the results of the Indonesian Basic Health Research RISKESDAS, (2018), data on the proportion of coverage in the provision of colostrum in Indonesia there are still those who do not give colostrum at all, this is

shown from the data on the proportion of maternal behavior towards giving colostrum to children, namely mothers who give colostrum all 85.4%, mothers who throw colostrum partially 6.9% and mothers who do not give colostrum at all which is 3.7%.

Mothers with normal labor will experience hormonal changes along with pregnancy until the mother breastfeeds. Colostrum is usually released immediately after delivery and will increase in volume after two days post partum (Brunse dkk., 2019; Kedkovid dkk., 2018; Picone dkk., 2018; Shivley dkk., 2018). Sectio Caesarea surgery in labor will cause pain and result in changes in tissue continuity due to surgery. The pain will cause various problems and affect lactation. In addition, SC delivery also decreases the let down reflex which can inhibit colostrum production. Cesarean delivery may not release colostrum in the first 24 hours after delivery, sometimes it takes up to 48 hours.

The picture of colostrum secretion in each type of labor experienced differences, as seen in research conducted by Endah (2019), where all respondents with spontaneous labor almost entirely secreted colostrum within  $\leq 120$  minutes (80%) and a small portion of colostrum secretion  $\geq 120$  minutes (20%). Respondents with the type of SC delivery mostly released colostrum  $\geq 120$  minutes, namely (67%) and released colostrum  $\leq 120$  minutes as much as (33.3%), this study is also in line with Almas (2018) spontaneously delivered mothers who experienced colostrum release  $\leq 120$  minutes (60%) and colostrum release  $\geq 120$  minutes by 40%.

Colostrum expenditure in SC who experienced colostrum expenditure  $\leq 120$  minutes amounted to 34.3% and colostrum expenditure  $\geq 120$  minutes amounted to 52.9%. Thus, there was a significant relationship between the type of delivery and the time of colostrum release in laboring mothers. The delay in colostrum expulsion time will have an impact on the mother and baby. Delay in the acquisition of colostrum in infants results in the baby's immune system being weak and susceptible to infection, while in mothers if colostrum is not given in the postpartum period as soon as possible, the postpartum recovery process will be delayed (Hammon et al., 2020; Kandimalla et al., 2021; Pyo et al., 2020) (Suherni, 2019).

From some of the explanations above, the author conducted a preliminary study at the EMC Pulomas Hospital research location from 5 spontaneous postpartum mothers with colostrum output  $\leq 120$  minutes as many as 4 respondents and  $\geq 120$  minutes 1 respondent, while in 5 respondents in labor the colostrum output action was  $\leq 120$  minutes 2 respondents and  $\geq 120$  minutes 3 respondents.

### Theoretical Review

In normal labor there is generally a drastic decrease in estrogen and progesterone levels immediately after the placenta is born, this triggers colostrum production. The mother's contact with the baby immediately after birth (skin to skin contact) has a psychological effect on the mother to breastfeed her baby, this is generally not done in cesarean delivery (Nurmala, 2018). In normal labor immediately after the birth of the placenta, a number of maternal changes occur as the physical and emotional stress of

labor and birth subsides and the mother enters postpartum healing and bonding (Abie & Goshu, 2019; Fischer dkk., 2018; Lago dkk., 2018; Wu dkk., 2019). At this time the baby can be suckled on the mother, the baby's suction on the mother's nipple will stimulate the production of oxytocin which functions to increase uterine contractions and colostrum production. Delivery by cesarean section will cause pain and result in changes in tissue continuity due to surgery.

In labor with sectio caesarea, the level of anxiety felt by the mother at the time of SC delivery is higher than that of mothers with normal labor, this is due to mothers who have never experienced surgery or ignorance of the mother about the actions that will be performed (Borad & Singh, 2018; Dunn dkk., 2018; Godden dkk., 2019; Hasan dkk., 2018). A particular problem in breastfeeding infants comes from the fact that many psychogenic factors or even general sympathetic nervous system stimuli throughout the mother's body can inhibit oxytocin secretion and consequently suppress milk ejection.

According to the World Health Organization (WHO, 2018) exclusive breastfeeding is providing only breast milk without giving other foods and drinks to babies from birth to 6 months of age, except for medicine and vitamins (Humune, 2020). As explained in the previous theory, maternal psychology has a significant effect on colostrum production. Hypothalamic regulation of Prolactin (PRL) secretion is mainly inhibitory, and dopamine is the most important inhibitory factor. Emotional responses such as insecurity, over-concentration and anxiety will increase dopamine production (Puppel dkk., 2019; Togo dkk., 2019; Zhao dkk., 2022).

## **RESEARCH METHODOLOGY**

Quantitative research with analytical observational methods with a cross sectional approach. The sample was 60 samples with the total sampling method. This research was conducted at EMC Pulomas Hospital, East Jakarta in 2023. Data collection with observation sheets, then data analysis was carried out with the chi-square test. With a p-value <0.05.

## **RESULT AND DISCUSSION**

Table 1

Frequency distribution of characteristics of age, education, parity, frequency of ANC, breast care at EMC Pulomas Hospital (n=60)

<b>Respondent characteristics</b>	<b>Total</b>	<b>Percentage (%)</b>
Age		
< 20 years or > 35 years	22	36,7
20-35 years	38	63,3
Education		
Low (elementary school, junior high school)	15	25,0
High (high school, university)	45	75,0

Parity		
Primigravida	23	38,3
Multigravida	37	61,7
ANC Frequency		
Less than 4 times	25	41,7
4 times or more	35	58,3
Breast Care		
No care	18	30,0
Care	42	70,0
	<b>60</b>	<b>100,0</b>

From table 1, data on the frequency distribution of respondent characteristics at EMC Pulomas Hospital were obtained, where out of 60 respondents, the majority of respondents had ages between 20-35 years as many as 38 respondents (63.3%). The majority of respondents had higher education (SMA, PT) as many as 45 respondents (75.0%), the majority of respondents had multigravida parity as many as 37 respondents (61.7%), the majority of respondents had ANC frequency of 4 times or more as many as 35 respondents (58.3%), the majority of respondents performed breast care as many as 42 respondents (70.0%).

The results of this study are in line with the results of research by Fauziah (2021) which states that the age of productive pregnant women is in the age range of 20 to 35 years because at that age the reproductive organs of the mother are mature in facing pregnancy and childbirth both physically and psychologically. According to the theoretical basis of Fitriana (2018), age is one of the factors considered to influence labor preparation where the age factor greatly influences attention in the labor process, where the younger the mother's age, the less attention and experience the pregnant woman has due to the mother's unpreparedness in accepting a pregnancy. The assumption of the researcher is that the age of the mother is largely an indicator of maturity in every decision making that refers to each of her experiences. Sufficient age in starting or entering marriage and pregnancy will help a person in maturity in dealing with problems or problems, in this case facing pregnancy and changes during pregnancy. Conversely, with an age of less than 20 years, the possibility of maturity of thought and behavior is also lacking, especially facing changes and adaptations during pregnancy. In addition, at a young age, the reproductive system is immature, so there will be a risk of disruption during pregnancy. This will have an impact on minimal preparation for childbirth and can have a negative impact during the delivery process (Matterson, 2001).

The results of Wardani's research (2019) state that the higher the education, the broader the insight so that the curiosity is also higher. This person is good at receiving information, so that he becomes knowledge. According to Sugiono (2018), education will encourage a person to be curious, to seek experience and to organize experience so that the information received will become knowledge. Highly educated mothers will more easily accept a new idea than mothers with low education. The assumption of the

researcher is that the higher the level of education of a person, it is expected to have a broad insight so that it has a higher sense of curiosity. Education will encourage a person to be curious, to seek experience and to organize experience so that the information received will become knowledge. Highly educated mothers will be more receptive to new ideas, so that they can have brighter future goals.

Rahmawati (2021) stated that respondents who made preparations for childbirth so that breast milk came out quickly were multigravida as much as 65%. This shows that the majority of respondents have more than 3 children. Based on the theoretical basis of Suherni (2019) which states that parity will affect mothers in preparing for childbirth, where mothers who already have experience giving birth will know and understand more about the equipment and other preparations needed in childbirth. Most nulliparous mothers only prepare financial preparations such as preparing fees, baby equipment, determining the place of delivery, and choosing a birth attendant. The assumption of the researcher is that most of the pregnant women with multigravida parity, where the majority ignore other important preparations such as preparing blood donors, decision makers in the event of complications in labor, and physical preparation with pregnancy exercises, as well as psychological preparation. This happens to nulliparous mothers because generally they do not yet have an idea of the events that will be experienced at the end of their pregnancy when labor occurs.

Fauziah (2021) states that respondents who have done ANC 4 times or more will understand the purpose of ANC examination in pregnant women. Based on the theoretical basis of Fitriana (2018) Antenatal visits for monitoring and supervision of the welfare of mothers and children at least four times during pregnancy in time, namely up to first trimester pregnancy (<14 weeks) one visit, second trimester pregnancy (14-28 weeks) one visit, third trimester pregnancy (28-36 weeks and after the 36th week) two visits. The activities in pregnancy examination and supervision include anamnesa, laboratory examination, basic intervention, special intervention according to conditions, providing counseling or knowledge, motivating pregnant women to take care of themselves during pregnancy. The assumption of the researcher, where in the application of practice is often used the minimum standard of Antenatal Care care, namely weighing body weight and measuring height, measuring the height of pregnant women is done to detect risk factors for pregnancy which are often related to the state of the pelvic cavity, measuring blood pressure at each antenatal visit is done to detect hypertension, measuring upper arm circumference, calculating fetal heart rate (DJJ), measuring the height of the fundus uteri, providing complete TT immunization, giving a minimum of 90 iron tablets during pregnancy.

Breast care is a way of taking care of the breasts during pregnancy or the postpartum period for breast milk production, in addition to breast hygiene and the shape of the nipple that goes inside or flat. Such nipples are actually not an obstacle for mothers to breastfeed well by knowing from the start, mothers have time to make efforts to make the nipples easier when breastfeeding (Welliana, 2018). The assumption of the researcher, that by doing breast care, the breast itself is a complement to the female

reproductive organs that require care and during the lactation period will release milk. The breasts may change color slightly before pregnancy, the areola (the area surrounding the nipple) is usually reddish, but will become brown and may enlarge during pregnancy and lactation. It is also very important to pay attention to personal hygiene. The purpose of breast care is to maintain breast hygiene so as to avoid infection, to moisturize the nipples, so that they are not easily chafed, to accentuate the nipples, to keep the shape of the breasts good, to prevent blockages, to increase milk production, to find out any abnormalities.

Table 2

Frequency distribution based on type of labor at EMC Pulomas Hospital (n=60)

Type of Delivery	Total	Percentage (%)
Sectio Caesarea	30	50,0
Normal	30	50,0
Total	60	100,0

From table 2, data were obtained on the frequency distribution of types of labor at EMC Pulomas Hospital, where out of 60 respondents had types of labor with SC and normal as many as 30 respondents (50.0%).

According to the theoretical basis of Suherni (2019) which states that Spontaneous labor in the process of childbirth is through the vagina which takes place without any assistive devices in the form of induction, vacuum where this is pure the mother only relies on energy and effort in pushing out the baby with the fetal head first or breech birth. While cesarean delivery is a way of delivering a fetus by making an incision in the uterine wall through the front wall of the abdomen; Caesarean section can also be defined as a hysteretomia to deliver the fetus from the uterus. The researcher's assumption is that the type of delivery, both normal and SC, is based on medical measures, if there is no problem, it is better to do normal delivery, because the side effects are smaller than SC. Meanwhile, delivery by SC was due to the patient's medical condition.

Table 3

Frequency distribution based on colostrum discharge at EMC Pulomas Hospital (n=60)

Colostrum discharge	Total	Percentage (%)
> 120 minutes	29	48,3
< 120 minutes	31	51,7
Total	80	100,0

Table 3 shows the frequency distribution of colostrum discharge in mothers at EMC Pulomas Hospital, where out of 60 respondents, 31 respondents (51.7%) had colostrum discharge less than 120 minutes.

The results of this study are in line with the results of Welliana's research (2018) which states that most respondents were able to remove colostromes and breast milk before 120 minutes. This shows that post partum mothers have succeeded in removing colostromes and breast milk easily. According to the theoretical basis of Fitriana (2018)

which states that colostrum is the first milk that comes out. Colostrum is secreted by the breast glands on the first to fourth day after childbirth. Colostrum is a liquid with thick viscosity, sticky and yellowish in color. Colostrum contains high protein, minerals, salt, vitamin A, 10 nitrogen, white blood cells and antibodies than mature breast milk. In addition, it still contains low fat and lactose. The main proteins in colostrum are immunoglobulins (IgG, IgA, and IgM), which are used as antibody substances to prevent and neutralize bacteria, viruses, fungi, and parasites. Although the colostrum that comes out is small by our standards, the volume of colostrum in the breast is close to the stomach capacity of a 1 - 2 day old baby. The volume of colostrum is between 150 - 300 ml/24 hours. Colostrum is also an ideal laxative for clearing unused substances from the newborn's intestines and preparing the digestive tract for the baby's upcoming meals. Researchers assume that colostrum is one part of breast milk (ASI) which has the characteristics of a yellowish liquid that comes out on the first day to the third day after childbirth. Colostrum contains many immune substances 10-17 times more than mature milk, so it is very good to be given because it functions to form baby's antibodies, colostrum is breast milk that comes out for the first time after childbirth. Some of the benefits of babies consuming colostrum include building the immune system, improving bowel movements, and preventing the risk of jaundice.

Table 4

Relationship between type of labor and colostrum discharge at EMC Pulomas Hospital (n=60)

Type of Delivery	Colostrum Discharge				Total		P Value	95% CI
	> 120 minutes		≤ 120 minutes					
	N	%	N	%	N	%		
SC	21	70,0	9	30,0	30	100,0	0,002	6,417 (2,084- 19,755)
Normal	8	26,7	22	73,3	30	100,0		
Total	29	48,3	31	51,7	60	100,0		

The results showed that out of 60 respondents, the highest proportion of normal labor and colostrum discharge was less than 120 minutes as many as 22 respondents (73.3%). Based on statistical tests, the p value <0.05 (0.002) was obtained, which means that there is a significant relationship between the type of labor and the duration of colostrum discharge at EMC Pulomas Hospital in 2023. A 95% CI or Odd Ratio value of 6.417 was obtained, which means that normal labor has a 6.4 times chance of colostrum discharge in less than 120 minutes compared to the type of delivery with sectio caesarea (SC) at EMC Pulomas Hospital.

The results of this study are in line with the results of Wardani's research (2019) which states that there is a significant relationship between the type of delivery and the duration of colostrum discharge in post partum mothers. The results of this study are also supported by the results of research by Welliana (2018) which states that there is a significant relationship between the type of labor and the duration of colostrum discharge in post partum mothers. The statistical test results obtained a p value <0.05



(0.010), which means that there is a significant relationship between the type of labor and the duration of colostrum discharge. The assumption of the researcher, in normal labor generally there is a drastic decrease in estrogen and progesterone levels immediately after the placenta is born, this triggers the release of colostrum. The mother's contact with the baby immediately after birth (skin to skin contact) has a psychological effect on the mother to breastfeed her baby, which is generally not done in cesarean delivery. In normal labor immediately after the delivery of the placenta, a number of maternal changes occur as the physical and emotional stress of labor and birth subsides and the mother enters postpartum healing and bonding. At this time the baby can be breastfed to the mother, the baby's suckling on the mother's nipple will stimulate the production of oxytocin which serves to increase uterine contractions and colostrum secretion. Delivery by cesarean section will cause pain and result in changes in tissue continuity due to surgery. In labor with sectio caesarea, the level of anxiety felt by the mother at the time of SC delivery is higher than that of mothers with normal labor, this is due to mothers who have never experienced surgery or ignorance of the mother about the actions to be taken. A particular problem in breastfeeding the baby comes from the fact that many psychogenic factors or even generalized sympathetic nervous system stimulation throughout the mother's body can inhibit oxytocin secretion and consequently suppress milk ejection. Maternal psychology has a significant effect on colostrum production. Hypothalamic regulation of Prolactin (PRL) secretion is mainly inhibitory, and dopamine is the most important inhibitory factor. Emotional responses such as insecurity, over-concentration and anxiety will increase dopamine production.

## **CONCLUSION**

1. It is known that the description of the characteristics of laboring mothers in stage IV at EMC Pulomas Hospital, the majority of respondents aged 20-35 years as much as 63.3%, the majority have high school education and PT as much as 75%, the majority have multigravida parity as much as 61.7%, the majority have a frequency of ANC 4 times or more as much as 58.3%, and the majority are breast care as much as 70%.
2. It is known that the description of the type of delivery in laboring mothers at EMC Pulomas Hospital, where both types of SC delivery and normal delivery are 50%.
3. The time of colostrum release in laboring mothers at EMC Pulomas Hospital is known, where the majority of colostrums came out before 120 minutes as much as 51.7%.
4. There is a relationship between the type of labor and the time of colostrum discharge in laboring mothers at EMC Pulomas Hospital, with a p-value <0.05 (0.002).

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