

The Effectiveness Of Colostrum Use On Acceleration Of Umbilical Cord Release Among The Infants At The Work Area Of Mekar Wangi Public Health Center Bogor City 2019

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Abstract

Infant mortality rate (IMR) Bogor In 2018 was 5.44 per 1000 live births, an increase compared to 2017 of 3.6 per 1000 live births. life birth which means there was no decrease. Umbilical cord infection has become the cause of pain and death among infants. Indonesia Health Profile 2018 stated that there were 40 babies affected by neonatal tetanus of which 4 babies died. Colostrum can accelerate the process of umbilical cord release through polymorph nuclear leukocytes, proteolysis enzymes and other immunological compounds. There are few bacterial colonies found on the umbilical cord when it is treated with the colostrum method. This research aim to determine the effectiveness of colostrum use to accelerate the release of the umbilical cord among infants in the Mekar Wangi Public Health Center in Bogor City. The study design used in this study was quasi-experimental (Quasi Experiment), using experimental and control groups. The samples in this study were 30 people. The sampling technique used was purposive sampling. The results of the study were obtained using the Independent t test, sig. (2 tailed) 0.008 < 0.05. There was an influence of the Colostrum methods on the time of umbilical cord release. It is expected that the institution can facilitate the development of research by increasing the source of books and collaborating with related institutions, and further researchers are expected to develop research related to the colostrum method so that it can be patented as a basic care for newborns

Keyword : acceleration of umbilical cord release, colostrum,

1. INTRODUCTION

There was approximately 220,017 infants' death occurred caused by less clean and less sterile umbilical cord treatment in Southeast Asia (Damanik, 2019). The high number of newborns' pain and death throughout the world is caused by infection. In 2017, WHO recorded that

there was 560,000 newborns' death, in which in 126,000 (21%) of them was caused by infection and occurred in Africa, while in Southeast Asia, there was 220,017 newborns' death caused by less clean umbilical cord treatment(Wihono, 2010).In 2018, Indonesian Health Profile indicated that there were 40 infants affected by neonatal tetanus of which 4 of them died. It increased significantly from the number of death caused by neonatal tetanus in 2017 which was 14 infants of 25 cases (Kurniawan, 2019).

The number of infants' death in Bogor City in 2017 was 41.82 per 1000 births which is the same as the previous period of 2013 to 2016 which was also 41.82 deaths per 1000 live births which means that there was no decrease occurred (Barat, 2018). The public health center of Mekar Wangi is one of public center with wide work area coverage. Preliminary survey that has been conducted showed that there is approximately 40 childbirth in a month. Based on the same survey, it was also found that the procedure of umbilical cord treatment for newborns used open treatment method.

Umbilical cord treatment is treatment action aims to treat the umbilical cord on newborns to keep it dry and prevent it from being infected. Incorrect umbilical cord treatment will cause the baby to suffer from infectious disease so that it causes death. This diseases is due to tetanus germ spore into the body through the umbilical cord, either from the equipment which is not sterile the use of drugs, powders or leaves spread on the umbilical cord causing infection(Hermanses, 2017). Neonatal infection is one of the causes of infants' death. Umbilical cord infection has become constant cause of pain and death throughout the world. There was 500,017 infants died due to neonatal tetanus and 460,017 infants died due to bacterial infection annually (Sodikin).

Colostrum contains polymorph nuclearleukocyte, proteolytic enzymes and immunology compound which can accelerate the process of umbilical cord release through (Hermanses, 2017). Previous research proved that most frequently bacteria found on the tip of umbilical cord is *S. Epidermidis*, *S. Aureus*, *E. Coli* and *KlebsielaPneumoniae*. Umbilical cord which is treated with dry and clean method is usually has more bacteria colony than umbilical cord treated using colostrum (Sulasmi, 2015).

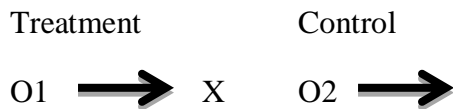
Colostrum has been used by KwaZulu-Natal Kenya as umbilical cord treatment method on newborns since it is proven to contain bioactive factors such as immunoglobulin, enzyme, cytokines, and cells which have effective function as anti-infection and anti-inflammation. Those various beneficial substances make the colostrum as alternative material to treat umbilical cord. Other reasons are because it is cheap, sterile, and easy to be performed by mothers and gives psychological satisfaction in treating the baby(Supriyanik & Handayani, 2011).

Research has been conducted to compare the effect of the colostrum application, open treatment and sterile bandage on umbilical cord treatment on 90 babies in Regional General Hospital (RSUD) of DR.M. Haulussy Ambon. At average, the release time of umbilical cord through colostrum application is less than through dry treatment method(Hermanses, 2017).

2. METHOD

Quasi-experimental research design was employed. Observation was performed in this research for 30 days on different treatments in which there is a group which obtained experimental treatment (given treatment in the form of colostrum as umbilical cord treatment method) and control group which did not get any treatment (did not obtain any treatment, the umbilical cord was according to the fixed procedure (*protap*) of the public health center.

Experiment



Information:

- O1 : Group obtained treatment
- X : Using colostrum on umbilical cord of the baby (intervention)
- O2 : Control group which did not get any treatment

The research samples who met the research criteria were 30 people, the criteria are:

- a. Newborns were born normal in Public Health Center of Mekarwangi.
- b. Newborns with birth weight at the range of 2500 – 4000 gram.
- c. Mothers of the baby release breast milk actively.
- d. Normal newborns who do not have any physical disability and healthy as well as willing to become respondents of the research.

Purposive sampling was employed as the sampling technique. This technique allows the researcher to select sample from the population purposively and based on certain consideration made according to the characteristics of the population known previously aiming so that the data obtained will be more representative (Notoatmodjo, 2010). Data analysis used univariate analysis through frequency distribution and bivariate analysis through independent t-test.

3. RESULT AND DISCUSSION

Discussion on the Length of Time of Newborns' Umbilical Cord Release using Colostrum Method

Table 1. Length of Time of Newborns' Umbilical Cord Release on Colostrum Group

Day	F	%
Day 4	5	33.3
Day 5	4	26.7
Day 6	5	33.3
Day 7	1	6.7
Day 8	0	0
Total	15	100

The table 1 above presents the analysis result on the time of newborns' umbilical cord release on intervention group or by using colostrum method on 15 respondents obtaining the intervention. Based on the table, it is obtained that the number of umbilical cord release on the day-8 was zero (0%), 5 newborns' on the day-4 (33.3%), 4 newborns' on the day-5 (26.7%), 5 newborns' on the day-6 and 1 newborns' on the day-8 (6.7%) which experienced the longest release of umbilical cord using colostrum method.

Colostrum treatment is umbilical cord release using yellowish viscous liquid released before mature breast milk, or breast milk which releases on the day-1 to day-3 after the labor. The function of colostrum in research Wulan Nur Insani (2015) is to protect the exposed body organ surface by preventing the attachment of bacteria and virus (Astari & Nurazizah, 2019). High protein contained in colostrum has several functions including forming the essential body bond, setting the body liquid balance, maintaining the body neutralization by reacting with the acid base so that the body pH is balanced, creating antibody as well as having important role in transferring nutrition body tissue. Such protein will bind with the breast milk in the umbilical cord so that it forms immune reaction and apoptosis process (necrosis). Colostrum also contains antioxidant which can overcome inflammation reaction occurs as body response on an infection (Mutmainah, Fatmawati, & Wahyuni, 2020).

Breast milk which is known as liquid gold is dark yellow serous fluid containing many antibody of IgA, IgG, IgM and has effect in protecting skin infection. It also has antibacterial and antiviral effects supporting the body immune system, increasing recovery and growth of musculoskeletal. IgA contained in colostrum is very effective in protecting baby from any infection and prevent the absorbance of foreign protein (Nita Arisanti, Andikawati, & Achmad, 2016). As it is easily available and used, breast milk become noninvasive method in treating umbilical cord. Umbilical cord release becomes shorter when it uses the method of breast milk application compared to the use of antiseptic method. It has been used as home-medicine for light disease such as conjunctivitis, insect bites and stings, contact dermatitis, infected wound, infected burns, and infected blisters (Elsobky, Emam, Abd Elmenim, & Shahin, 2017).

Umbilical cord on newborns is usually grayish white, shiny, sleek, and fresh. However, as the time goes, it becomes yellowish and the umbilical cord form shrinks and become purplish black. On the day 5-7 to first 14 days it will become smaller and then forms yellowish circle on the base. Before treating the umbilical cord, it is important to consider the babies' cleanliness therefore it is better to be managed after the baby is bathed which is 6 hours after the labor (Astari & Nurazizah, 2019). Thus, the use of colostrum for treating the newborns' umbilical cord is really good to prevent infection on the umbilical cord and fasten its release. The release of umbilical cord will be faster if there is no infection. There are several benefits of treatment using colostrum which are cheap, easy, natural, only need short time, clean, preventing infection on newborns, safe, decrease the time of umbilical cord release and gives psychological need between the mother and her baby (*Bounding Attachment*) (Aghamohammadi, Zafari, & Moslemi, 2012).

Fita S and Sri Handayani conducted previous research on umbilical cord treatment by spreading it for 1 or 2 drops all over the babies' body after the baby is bathed to keep him clean (Supriyanik & Handayani, 2011). Another research project conducted by Ika S and Ely Eko (2011) on the use of colostrum in umbilical cord treatment has effectiveness of 94.23 hours

with the fastest time is 54.83 hours and the latest time is 170.50 hours. This can be affected by the colostrum content of high protein reaching 4.1 gr%, which has important role in recovering the damaged cells, fasten the healing process so that it able to fasten the umbilical cord relea(Sofiana & Agustina, 2013). Informing the mothers and family regarding the use of colostrum method in treating the umbilical cord is very important so that they can apply it at home.

Discussion on the Length of Time of Newborns’ Umbilical Cord Release on Control Group

Table 2
 Length of Time of Newborns’ Umbilical Cord Release on Control Group

Day	F	%
Day4	2	13.3
Day5	1	6.7
Day6	5	33.3
Day7	4	26.7
Day8	3	20.0
Total	15	100

Table 2 shows the result analysis of the control group consisting 15 respondents. Among those respondents, 3 newborns (20%) experienced umbilical cord release on day-8, 4 newborns (26.7%) on day-7, 5 newborns (33.3%) on day-6, one newborn (6.7%) on day-5, and 2 newborns (13.3%) on day-4, the fastest day of umbilical cord release on control group. An interview was conducted on several midwives in Public Health Center of Mekarwangi obtaining information that open method has been used since 2010 until now. Almost all community including the newborns’ born in Public Health Center of Mekarwangi has known such method. In the last several years, the umbilical cord release done using alcohol 70%, *povidon iodine*, turmeric or others herbs was still found in several places especially in Mekarwangi area, so that the infants’ death case due to tetanus were still found. Although the health workers still found difficulty to inform the community, however as time goes by, the community is finally understand regarding the umbilical cord release using more natural open treatment which is good for the newborns. The community understand how to shorten the length of time of umbilical cord release which is done without using alcohol 70%, *povidon iodine*, turmeric or other herbs.

According to Dewi (2015), the umbilical cord release using air assistance is occurred after the umbilical cord is cut. There will be colonization after the cut started few hours after the birth due to non-pathogenic organism from the mother and enter the baby through skin contacts(Dewi & Sunarsih, 2011). According to Lumsden (2012) bad hygiene, bad handwash, and cross infection from the health workers can distribute the dangerous bacteria (Kartikasari, Wijayanegara, & Syarief). There is Wharton’s jelly in the umbilical cord of body stalk. Body stalk is where the embryo is planted into the mother’s endometrium. This area is originally above amnion. When amnion gets larger, the embryo will shift from the body stalk to

posterior (kauda). Body stalk will experience extension and downsizing becoming umbilical cord.

Wharton's jelly is sticky substance surrounding the blood vessel on umbilical cord. This jelly protects the blood vessel from compression so that the food delivery for the fetus can be continuously assured. Furthermore, this jelly can also prevent bending on the umbilical cord. It will expand when it is exposed to the air and sometimes compiled into small clump and form fake knot in the umbilical cord. This jelly contains much water thus after the baby is born, the umbilical cord is easily dried and easily released from the baby navel (Cunningham et al., 2016).

When Wharton jelly is exposed to cool temperature or air outside mothers' body, it will change the structure and physiologically change its function into solid and clamp the umbilical cord automatically in 5 until 30 minutes after the baby is born (Eprila, Muhayan, & Lestari, 2014). The clamping of the whatson jelly on the umbilical cord causes the blood flow on the blood vessel in remaining umbilical cord is inhibited or even does not flow anymore. The umbilical cord which does not get blood will become dry and withered and the remaining umbilical cord will be released. The exposure of air causes the water content in the Wharton jelly and blood vessel decreases or even disappear. The water which disappears from the Wharton jelly causes mummification of the umbilical cord soon after the baby is born (Cunningham et al., 2016). The mummification of umbilical cord is the change of the white color of umbilicalcord or even the disappearance of the white color of the umbilical cord and change into brownish yellow, dry or blackish dry and rigid. After the mummification, the umbilical cord will be dry, and morphologically change so that it soon released from the baby. Wharton jelly consists of *mucopolysaccharides* (fat), leukocyte and stalk cell (Eprila et al., 2014).

Hunt inAmrullah (2015) explained that the tissue oxygenation is one of the factors affecting the process of wound healing. Enough oxygenation is really needed by this process. The better the oxygenation, the faster the wound healing will be. The oxygen level in tissue is important in forming new cells. Open wound or wound which is exposed to the air will dry faster. Oxygen has important role in forming the collagen, new capillaries, epithelium improvement, and infection control. Therefore the cover or bandage of the umbilical cord must be chosen wisely so that the gas and air exchange is fluent. However, it is better to left open the umbilical cord so that the release of it is faster (Eprila et al., 2014).

The research result shows that the treatment of umbilical cord using colostrum did not cause infection on the umbilical cord with the percentage of 100%. Researcher performed follow-up for every day to check the umbilical cord infection signs such as the existence of pus, bleeding, the increase of baby temperature, bad odor, reddish around the umbilical cord base and other signs. The result of the research indicated that there was no infection happened occurred on both groups. The sign of infection on baby can be in the form of the baby look anxious and fussy, the existence of reddish around the base of the umbilical cord and belly, there is bad odor and pus released around the umbilical cord and the temperature of the baby increase.

This is in line with the previous research conducted by GloshanandHusein (2013) which indicated that the group which used colostrum method has faster umbilical cord release than open method using alcohol 70% (Golshan & Hossein, 2013). Pujar, DF (2013) also conducted similar research resulting that the release of umbilical cord using colostrum method was faster than the treatment which did not use colostrum (Pujar, Deepa, & Francis, 2013).

The Comparison of the Length of Time of Umbilical Cord using Colostrum Method and Open Method on Newborns

The bivariate analysis through independent t-test conducted from data normality test in this research using SaphiroWilk test obtained significant value for the length of time of the umbilical cord release using colostrum of 0.025, while control group obtained 0.099 or ($p > \alpha$). Therefore the data is distributed normally so that the independent t-test was used. The research result obtained in table 4.5 shows the average of umbilical cord release of 5.13 or about 5 days on colostrum method, while control group took around 6.33 days. This shows that there was difference on the length of time of umbilical cord release between the colostrum method group and control group with the difference of 1.2 day or 28.8 hours.

Table 3
 The Effect of Colostrum on the Acceleration of Newborns' Umbilical Cord Release on Intervention and Control Groups

Types of Umbilical Cord Treatment	N	Mean	Pvalue	Std. Deviation	Std. Error Mean
Colostrum	15	5.13	0.008	0.994	0.255
Open	15	6.33		1.290	0.333

It was proven through this research that there was significant relationship ($p = 0.008$) between the two methods with the length of time of the umbilical cord. It means that $p = 0.008 < 0.05$, thus the hypothesis of the research is accepted since there was effect of the colostrum method in the umbilical cord treatment on the length of time of the release on newborns.

Blood supply from the mothers will be released during the cut of the umbilical cord. After the umbilical cord is cut and banded, it needs to be treated. The purpose of the umbilical cord treatment is to keep the umbilical cord dry and prevented from infection. It needs to be treated to prevent the umbilical cord to become the media of pathogen microorganism breeding. Good and correct umbilical cord treatment will affect positively in which the umbilical cord will be released on the day-5 to 7 without any complication, while the negative effect of bad and incorrect umbilical cord treatment is that the baby will experience neonatal tetanus and cause death (Kemenkes, 2015).

The umbilical cord release mechanism using open treatment is started from the cutting of umbilical cord which causes the umbilical cord to not obtain any blood supply (food intake). The pulsation will stop since the outside temperature causes contraction, then the blood vessel will lose water suddenly. Since the umbilical cord does not get any blood supply, it will be withered and dry. The drying and release of the umbilical cord becomes easier because it is exposed to the air. According to Cunningham *et.al* (2016), the water from the Wharton jelly will disappear and experience mummification and morphological change so that the umbilical cord will be released (Astari & Nurazizah, 2019).

Umbilical cord which is opened freely and exposed to the air will make it become dry faster in addition to the provision of colostrum which is a natural substance to fasten the drying. Umbilical cord treatment basically needs to be clean, sterile, natural, moist, dry and in accordance with the method so that it will avoid the occurrence of infection on the umbilical cord. Furthermore, the use of colostrum to treat umbilical cord which can avoid infection is also due to the anti-inflammation and anti-bacteria substance so that the umbilical cord which is smeared with colostrum will be protected from germs.

Colostrum and open method have the same principle which is uncovered. However, there are actually differences between the two treatments. Allam, Wafa, & Talat (2015) conducted a research resulting that 80% of the experimental group's length of time of the umbilical cord release was at the average of 4-5 days and only 20% of the control group took 5-6 days for the release of the umbilical cord. Furthermore, there was 1 newborn on the control group who experienced the release on the day-5 while the other 75% of the newborns experienced release of their umbilical cord on the day-7 (Allam, Wafa, & Talat, 2015). Health workers and mothers need to know that colostrum method can also be used to fasten the umbilical cord release on newborns. In addition to decrease the possibility of infection, it also saves more money because infection can cause to cost much money for the medication (Astari & Nurazizah, 2019).

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4. CONCLUSION AND SUGGESTION

There was effect of colostrum method on the length of time of umbilical cord release. It is expected that the institution can facilitate the development of research by adding book source and cooperate with relevant institution. Future researcher is expected to develop the research by adding the number of samples so that it can get maximal result.

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