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THE EFFECT OF KANGAROO MOTHER CARE ON INFANT'S WEIGHT GAIN AND OXYGEN SATURATION

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Abstract

Low birth weight (LBW) infants experienced respiratory and growth problems so they need special treatment such as kangaroo mother care method (KMC). The objectives of this study were to investigation effects of KMC on LBW's weight gain and oxygen saturation. A quasi experimental pre and post with control group design was performed in LBW infants. A total of 34 LBW infants who chosen by purposive sampling were divided into intervention group (17 LBW infants received intermittent KMC two hours/day for seven days) and control group (17 LBW infants received conventional care incubator). Independent t test was performed to be compared mean weight gain and oxygen saturation between control group and intervention group. Better weight gain (p<0.001) and oxygen saturation (p=0.019) were seen in infants who receiving intermittent KMC. Future study should be combine KMC with baby massage

Keywords: KMC, LBW, oxygen saturation, weight gain

Introduction

Pregnant women with health problems will cause prenatal problems. Severity of prenatal problems affects the variation in birth weight and gestational age. Birth weight less than 2500 grams called low birth weight (LBW). Physiological conditions LBW rudimentary cause various health problems (Kennerr & McGrath, 2004; Sandler, 2000). Health problems can occur in LBW are hypoxic ischemic encelophathy (HIE), periventricular leukomalacia (PVL), respiratory distress syndrome, Retinopathy of prematurity (ROP), and hiperbilirubinemia (Kennerr & McGrath, 2004). Indonesian national data indicate health problems that became one of the causes of infant death was respiratory problem (Badan Penelitian dan Pengembangan Kesehatan Kementerian Kesehatan Republik Indonesia, 2007). Kangaroo mother care (KMC) has become a national program (Departemen Kesehatan/ Depkes, 2008). KMC can improve physiological stability of preterm infants (Ali, Sharma, Sharma, & Alam, 2009; Thukral, Chawla, Agarwal, Deorari, & Paul, 2008). KMC have a positive effect on the growth of infant (Subedi, Aryal, & Gurubacharya, 2008). KMC provides more opportunities for mothers to breastfeed (Falacing, Ewald, & Wallin, 2011; Gatwala, Sing, & Sing, 2010). KMC showed to protect against the dangerous condition lbw life-threatening (Lawn, Kambanfwile, Horta, Barros, & Causens, 2010; Dutt, 2012). KMC performed for 6-8 hours per day can increase oxygen saturation in preterm (p = < 0.001). Deaths are more common in the group of preterm infants with low oxygen saturation (Carlo, Finer, Wals, Rich, Ganz, & Laptook, 2010). Other studies obtain results that there was no difference in oxygen saturation at KMC compared with prone and supine positions (Heimann, Vaeben, Peschgens, Wenz, & Orlikowsky, 2009). Deaths are more common in low birth weight with low oxygen saturation thus, requiring supplemental oxygen, but this can lead harm of LBW. LBW also make a risk of growth retardation that can be measured by weight, necessary an effort to resolve the issue such as KMC. Based on the description above, this research question is "how KMC effect on weight gain and oxygen saturation in LBW?". The objectives of this study is identified the effects of KMC on weight gain and oxygen saturation in LBW.

Methodology

The research method of this study using a quasi experimental, pre-post test design with control group. Intervention was intermittent KMC 2 hours/ day for 7 days. The control group have of conventional treatment in an incubator. Weight were measured before and after KMC. During the KMC infant oxygen saturation were monitored every 20 minutes. Analysis of the data using unpaired t test. The sample size of each group was 17 LBW. Inclusion criteria were birth weight <2500 grams, the physiological condition of the baby in the normal range for two consecutive days (body temperature of 36.5 ° C - 37.5 ° C, respiratory 40-60 x / min, and pulse 110-160x/mnt), family agreed to becoming a respondent. Exclusion criteria were infants have congenital abnormalities that cause infant health condition unstable, are still using respiratory aids, and pathologic hyperbilirubinemia

Results

The results showed similar characteristics of the two groups (Table 1). Homogeneity test before the second intervention group saw no difference in characteristics (birth weight, gender, age, and weight before intervention) between the two groups thus, eligible for intervention. Pictures of body weight after the intervention and oxygen saturation during interventional shown in table 2.

Table.1. Distribution of Respondents Based on Characteristic of control and Intervention group (n=34)

No	Respondent's Characteristics	Groups		P
		Control (n=17)	Intervention (n=17)	
1	Birth weight, *mean* (SD), grams	2038,24 (96,06)	2079,41(118,66)	0,60
2	Gender, n (%)			0,47
	a. Male	9 (52,9)	14 (82,3)	
	b. Female	8 (47,1)	3(17,7)	
3	Age, *mean* (SD), day	9,5 (2,03)	9,7 (2,14)	0,69
4	Weight before intervention, *mean* (SD), gram	1947,06 (315,47)	2017,06 (168,66)	0,42

The mean weight after intervention was higher in LBW who received KMC compared LBW who received conventional care in an incubator (1926.47 ± 2188.23 vs 308.79 ± 197.27 g). Weight gain after intervention shows that the value is not the same in the two groups (-20.59 ± 153.53 vs 114.64 ± 92.33 g). Weight gain occurred in the intervention group with a mean increase in 153.53 ± 92.33 grams. The mean oxygen saturation of the control group is slightly lower than the intervention group (96.18±1.29 vs 96.6±1.1%).
Normality test results show that data were normally distributed so data analysis can proceed using the paired t test (Table3).

Table.2. Overview Weight and Oxygen Saturation Respondents (n = 34)

No	Variables	Groups	
		Control (n=17)	Intervention (n=17)
1	Weight after intervention, *Mean* (SD), gram	1926,47 (308,79)	2188,23 (197,2
2	Weight gain, *Mean* (SD), gram	-20,59 (114,64)	153,53 (92,33)
3	Oxygen Saturation, *Mean* (SD), %	96,18 (1,29)	97,1 (0,66)

recommended the implementation of an early KMC. Recommendation implementation of KMC in the high-tech space such as the NICU is also suggested by Nyqvlst, Anderson, Bergman, Cttaneo, Charkpak, Davanso & Windstrom (2010). KMC is still being done in the NICU care environments with although the infant is still using a proponent of oxygen.

Heiman et al. (2009) classified de saturation into 2 categories, namely moderate de saturation and severe de saturation. Mild de saturation occurs when SpO_2 values between 80-85 %. Severe de saturation occurs when the value of SpO_2 < 80 %. De saturation can be overcome with oxygen therapy but it has side effects that can lead to ROP. ROP can be avoided by maintaining the oxygen saturation in the range of 88 % -92 % (Harrison, 2011). Infant with gestational age < 34 weeks, oxygen saturation was maintained between 88 % - 93 %. Infants who use a ventilator, 88%-100% do not use the ventilator. Oxygen saturation of infants with gestational age 35-36 weeks was maintained at 93-98 % when a baby is on a ventilator , 93-100 % in infants who do not use the ventilator (Patria & Fairuz , 2012; Lau , Tay , Shah , Chang , & Loh, 201; Fallon , 2012). The results showed that the average infant whose get KMC have oxygen saturation 97.06 $\pm$ 0.66 %. Infants do not use ventilator, so that the mean oxygen saturation showed that oxygen saturation targets in accordance with 93-100 %. The risk of de saturation at LBW who got KMC can be derived.

Oxygen saturation in the blood oxygen needed for metabolism to produce energy. According to Meleis (2012) considers that the theory of energy conservation depends on the energy exchange with the environment so that the system can constantly maintain the lives of the energy supply. KMC position is condition the skin directly to the mother and baby's skin. Infant will adjust to mother body temperature adaptation. The temperature synchronization keep the Infant's body temperature remains stable at normal temperature range. Normal body temperature will keep the oxyhemoglobin in the red blood cells remain stable so that LBWs have normal metabolism and generate energy for growth. Hypertemai causes the release of oxygen to the tissue increases so oxyhemoglobin dissociation curve shifts to the left. Hypothermia causes the release of oxygen to the tissue decreases, so the oxyhemoglobin dissociation curve shifts to the right. Normal body temperature does not cause a shift in the oxyhemoglobin dissociation curve.

Conclusion

The results showed there is effect on increased body weight and LBW's oxygen saturation. Mendes & Procianoy research (2008) shows that infant massage is able to reduce the number of neonatal sepsis and weight increase but not significantly so the next studies are expected to combine KMC with infant massage intervention.

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