

The Differences between Pregnant Women with Obese and Non Obese towards Length of Labor Time in SADEWA Mother and Children Hospital, Yogyakarta

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Abstract

According to the study, the incidence of prolonged labor is 2.8% -4.9%. The prolonged labor can cause complications and can improve mortality both to the mother and the children. Prolonged labor contributed 5% of the mortality and morbidity of the mothers and babies born in Indonesia. The prevalence of obesity in Indonesia was greater in women (23.8%) than men (13.9%). The active phase of first stage of labor in pregnant women with overweight and obesity was longer than pregnant women with normal weight. The purpose of this research is finding the difference length of labor time between pregnant women with obese and non-obese. This research is cross sectional method which is using retrospective approach. The subject in this research is primigravida and multigravida which is get normal labor in SADEWA Mother and Children Hospital of Yogyakarta 2010 until 2013 that is consists of obese and non-obese category. The instrument of this research is medical record of the pregnant women who have passed of labor. The analyzed of data using Mann Whitney test and the result are there is no differences long of first stage, second stage and fourth stage of labor time between primigravida with obese and non-obese category ($p=0,693$; $p=0,913$; $p=1,00$; $p<0,05$), there is differences length of third stage of labor time between primigravida with obese and non-obese category ($p=0,013$; $p<0,05$), there is differences long of first stage and third stage of labor time between multigravida with obese and non-obese category ($p=0,011$ dan $p=0,042$; $p<0,05$), there is no differences length of second stage and fourth stage of labor time between multigravida with obese and non-obese category ($p=0,765$ dan $p=1,00$; $p<0,05$). The conclusion of this research is obesity before pregnant has influence the length of first stage of labor time in primigravida and third stage of labor time both to the primigravida and multigravida.

Keywords: Pregnant Women, Obese, Non-Obese, Length Of Labor Time

PRELIMINARY

Incidence of prolonged labor according to the study 2.8% -4.9% (Mochtar, 1998). Prolonged labor in Indonesia accounted for 5% of the mortality and morbidity of mothers and babies born in Indonesia.

In pregnant women with overweight and obesity, time the active phase of the first stage of labor longer than pregnant women with normal weight (Vahratian *et al.*, 2004).

Based on reports the Basic Health Research in 2007 showed the prevalence of obesity in Indonesia (aged 15 years and over) of 10.3%. National obesity prevalence in Indonesia is greater in women (23.8%) than men (13.9%). Currently more than 6 million people in Indonesia are suffering from obesity (Ministry of Health., 2004).

Meanwhile, according to RISKESDAS 2007, the prevalence of obesity in the adult population aged over 15 years in Yogyakarta was 18.7% with 14.6% in men and 22.5% in women. The cause of prolonged labor which usually occur frequently in maternal and appeared well in early labor and in the middle of on the delivery process is the power factor of the presence of uterine activity inefficient.

According to Zhang *et al.* (2007), woman with obesity have a weakness on the strength and frequency on contractions myometrium compared with women who had normal weight.

Based on these problems, should be conducted research on " The Differences Between Pregnant Women With *Obese* And Non *Obese* Towards Length of Labor Time in SADEWA Mother and Children Hospital Yogyakarta".

RESEARCH METHOD

This research is an analytic observational using the retrospective approach with cross sectional study design to see the difference between pregnant women with obese and non-obese to length of delivery time by measuring instantaneous. The population used in this study were all pregnant women who experienced normal deliveries at SADEWA Mother and Children Hospital Yogyakarta in 2010-2013.

Samples were as many as 148 pregnant women who had normal deliveries in SADEWA Mother and Children Hospital Yogyakarta were divided into primigravida group and multigravida group, respectively.

Samples taken must comply inclusion and exclusion criteria first. The criteria for inclusion, namely

pregnant women with obese, non-obese pregnant women, lead a normal delivery (spontaneous labor), primigravida and multigravida, whereas exclusion criteria are macrosomia, the size of the mother's pelvis is narrow, maternal age <20 years and > 35 years, and disorders location of the baby (passenger).

The independent variable of this study was to obese pregnant women, while the dependent variable of the study was a length of labor time with non-obese pregnant women as a control.

The tools used in this research is the patient's medical record and a worksheet. This research has been conducted in SADEWA Mother and Children Hospital Yogyakarta in December 2013 until January 2014. The research begins with a letter requesting permission to conduct research in SADEWA Mother and Children Hospital Yogyakarta, then give informed consent to the nurses to do data retrieval research by looking at medical records of patients with pregnant women who do normal deliveries at the hospital. After that, researchers collect all medical records of patients either multigravida or primigravida who had normal deliveries in 2010-2013 which has fulfilled inclusion and exclusion criteria, the data is then divided each into the category of obese and non-obese.

The data have been collected, processed to determine the distribution of BMI and weight gain groups of obese and non-obese in each primigravida and multigravida. Data were measured by the Mann Whitney test to determine the significance of differences between the study groups.

RESULT

Research results obtained in the primigravida group of pregnant women and multi gravida, the category of obese and non-obese can be seen in Table 1.

Category BMI	BMI	Weighth of increase
<i>Obese</i>	28,22	14,90
Non- <i>obese</i>	20,35	13,97

In Table 1 it appears that the average BMI in pregnant women primigravida with obese category was 28.22 kg / m² with an increase in weight loss of 14.90 kg, while the average BMI in pregnant women primigravida, non-obese category is 20 , 35 kg / m² with an increase in weight loss of 13.97 kg.

Table 2. Description of Increasing Pregnant Mother Weight Gain multigravida during pregnancy in Special Hospital Mother and Child of Sadewa, Yogyakarta.

Category BMI	BMI	Weight gain
<i>Obese</i>	27,35	16
Non- <i>obese</i>	20,34	13,54

In Table 2 it appears that the average BMI in the multigravida pregnant women, obese category was 27.35 kg / m² with an increase in weight loss of 16 kg, while the average BMI in pregnant women multigravida non-obese category was 20.34 kg / m² with an increase in weight loss of 13.54 kg.

Table 3. Differences Between Lenght of Delivery at primigravida with Category Obese and Non-obese SADEWA Mother and Children Hospital Yogyakarta.

Stages of labor	The average length of labor		p value
	Obese	Non-obese	
Stage I	10,74	10,22	0,693
Stage II	28,97	28,24	0,913
Stage III	9,95	5,68	0,013
Stage IV	1,75	1,75	1,00

Based on hypothesis using the Mann Whitney test at the table 3. The above shows that there is no difference in the average length of labor time of stage I, stage II and stage IV between primigravida pregnant women with obese category and the of non-obese category ($p = 0.693$, $p = 0.913$, $p = 1.00$; $p > 0.05$), while in the third stage of delivery there are differences in the average length of the third stage of delivery is significant between pregnant women primigravid category of non-obese and obese before pregnancy ($p = 0.013$; $p < 0.05$).

Table 4. Differences Between Length of Delivery Pregnant Women multigravida Category Obese And Non-obese In SADEWA Mother and Children Hospital Yogyakarta.

Stages of labor	Mean		p Value
	Obese	Non-obese	
Stage I	10,44	7,45	0,011
Stage II	21.95	21.38	0,765
Stage III	6.22	5.38	0.042
Stage IV	1,75	1,75	1,00

Based on hypothesis using the Mann Whitney test at the table 4 above shows that there is a difference of duration of labour at first stage of delivery and significant of the third stage between multigravida pregnant women, the obese category and non-obese category ($p=0,011$ and $p=0,042$; $p < 0,05$), whereas on obese category and non-obese category not found a significant ($p=0$ duration of labour stage II and stage IV between multigravida pregnant women ($p=0,765$ and $p=1.00$; $p > 0,05$).

DISCUSSION

In Table 3 shows that there is no difference significantly in duration labour of first stage between pregnant women of primigravida, obese category and non-obese category ($p > 0.05$). These results are not comparable with the study from Vahratian *et al* (2004) who found that the active phase of the first stage delivery in pregnant women in obese category are longer compared with pregnant women of normal category. The average length of active phase in the category of obese pregnant women lasted for 7.9 hours while the normal categories of pregnant women lasted for 6.2 hours.

Differences in the results of this study can be caused by several factors such as maternal psychological factors that mother anxiety when faced the delivery process. Anxiety in pregnant women can increase the release of catecholamines which will cause a decrease maternal uterine blood flow which will then lower the pulse rate of the fetus, reducing the activity of uterine contractions, causing the active phase of delivery becomes longer, and low Apgar score (Lederman *et al.*, 1985).

In this research, each of pregnant women have a level of anxiety are different, both in the category of

obese pregnant women and non-obese. Based on research conducted by Helmi (2010) showed that there is a correlation between anxiety with duration of labor in pregnant women, where the higher levels of maternal anxiety in the face of labor, the delivery will take longer.

Furthermore the duration of delivery process also influenced by the power factor are the contraction and strength of the mother during pushing and gymnastic or exercise during pregnancy also have an influence on the duration of delivery in pregnant women. Regular pregnancy gymnastic is a useful exercise to help pregnant women obtain good power so as to facilitate the delivery process (Mochtar, 1998). In this research, not all pregnant women lead pregnancy exercise either with the category of obese pregnant women and non-obese.

Pregnancy exercise can increase levels of noradrenaline in the blood flow to the uterus and placenta thus increasing perfusion of the uterine muscle and will increase uterine muscle contraction (Tortora & Derrickson, 2006). Based on research conducted by Riyadi (2010) found that there is significant influence between the frequency of pregnancy exercise with a length of labor stage I.

In Table 4 shows that there are differences of labor longer in the first stage significant among women multigravida by category obese and non-obese category ($p < 0.05$). From the research results be obtained that the average length of first stage of labor in pregnant women multigravida obese category lasts 10.44 hours, while in pregnant women multigravida non-obese category lasted for 7.45 hours. Results of this study are comparable with research conducted by Vahratian *et al* (2004) in which the average length of active phase in the category of obese pregnant women lasted for 7.9 hours while the pregnant women of normal category lasts for 6.2 hours. In pregnant women with obese category, duration of delivery of cervical dilatation of 4 cm to 10 cm lasted for 7 hours while in pregnant women with normal category cervical dilatation of 4 cm to 10 cm lasted for 5.4 hours. cervical dilatation before 6 cm in pregnant women with significantly obese category is slower than the normal category.

Some researchers argue that this is due to the addition of soft tissue deposits in the pelvis of pregnant women with obese category in which when combined with the large size of the baby's body will require more time and adequate contractions during labor progress (Jensen *et al.*, 1999). Several studies have shown that during pregnancy, maternal body fat accumulates in an area more central than peripheral, especially in pregnant women with obese category. This allows the addition of soft tissue deposits in the pelvis of pregnant women in the obese category then will narrow birth canal diameter and extend the time of delivery (Ehrenberg *et al.*, 2003; Soltani *et al.*, 2000).

In Table 3 and table 4 shows that there is no difference length of labor in second stage between categories of non-obese and obese categories both in pregnant women and multigravida primigravid ($p > 0.05$). Results of research both in the group of primigravid pregnant women and multigravida comparable with research conducted by Buhimscie *et al* (2004) which found the length of time having a baby (stage II) between the category of obese pregnant women and pregnant women with normal category is the same. This is because the category of obese pregnant women and pregnant women with normal category has the same intrauterine pressure increase when the second stage of labor lasted.

However, based on research conducted by Riyadi (2010) found that there is a pregnancy exercise influence on the length of labor time of second stage is seen from pregnant women who do pregnancy exercise regularly. But researchers do not agree with the research conducted by Riyadi (2010), because research conducted only see the effect of pregnancy exercise is done regularly. While based on research conducted by Kusumaningtyas (2008) showed that there was no pregnancy exercise influence on the length second stage of labor and the views from the third stage of pregnancy exercise ever conducted. Furthermore, based on research conducted by Buhimscie *et al* (2004) concluded that the ability to straining during the second stage of labor among pregnant women with obese categories and pregnant women with normal category is the same.

In Table 3 and Table 4 show that there are differences in the length of labor time of third stage between categories of obese and non-obese category both in primigravida pregnant women and multigravida ($p < 0.05$).

The third stage is the stage separator and eksplusi placenta (Wiknjosastro, 2007). Placental birth process requires adequate uterine contractions to disengage from the uterine wall (Prawiroharjo, 2002). Results of research both in group primigravida and group multigravida above relate to research conducted by Zang *et al* (2007) in which the category of obese pregnant women with have a decrease in amplitude and frequency of contractions from the myometrium compared with pregnant women with normal category so that pregnant women with categories obese have a weakness ability to perform uterine contractions so that the strength and frequency of contractions myometrium becomes poor with the flux of calcium (Ca^{2+}) slightly compared with pregnant women of normal category. This is thought because of the high levels of cholesterol in the body of pregnant women are obese category thus affecting the effectiveness of uterine contractions.

Cholesterol is an essential component of cell membranes where it has been found to have an important role in controlling smooth muscle contraction (Gostynski *et al.*, 2004). Some components of cellular signaling systems have an important role to transduction of smooth muscle which have been found in areas rich in cholesterol from the cell membrane known as fat rafts and caveolae (Dreja *et al.*, 2004; Smith *et al.*, 2004).

Estrogen and oxytocin receptors in the myometrium membrane localized to caveolae and efficacy modulated by cholesterol component (Simons *et al.*, 2000). In serum and membrane obese category myometrium of pregnant women found that high cholesterol levels which can affect the contractility of the myometrium be inadequate so can lead to dysfunctional labor that will then lead to a cesarean section be an option for doctor to save the mother and her baby (Kim *et al.*, 1998).

In Table 3 and Table 4 show that it was found that there is no longer a difference between categories IV stage of labor is obese and non-obese both in pregnant women and pregnant women primigravida and multigravida ($p > 0.05$).

Stage IV delivery is the time when monitoring where these need to be observed if the number of postpartum hemorrhage that occurs. These observations were made about 2 hours (Wiknjosastro, 2007). In this research, the researchers did not assess the amount of postpartum hemorrhage that occurs, but just look at the length of time when the stage IV delivery takes a long time where the stage IV delivery on every pregnant woman either primigravida and multigravida between obese and non-obese category is the same 1.75 hours.

Based on research conducted by Zhang *et al.* (2007) found that obesity can inhibit uterine contractions which will then lead to postpartum hemorrhage. If the uterine contractility is interrupted, then the mother will undergo excessive blood loss which would then endanger the mother's life. In the category of obese pregnant women has found high levels of LDL cholesterol and low HDL cholesterol levels compared with pregnant women of normal category (Pobedinskii, 1987). Increased levels of LDL cholesterol is associated with an increased ratio of free cholesterol and membrane viscosity changes which would affect the functioning of the translocation of calcium (Ca^{2+}) from the extracellular space to the cytoplasm during cycles of contraction-relaxation of smooth muscle cells which then would lead to a decrease in the frequency of uterine contractions (Wray *et al.*, 2003).

CONCLUSION

Based on the research that has been done in SADEWA Mother and Children Hospital Yogyakarta, it can be concluded that:

1. There is no a difference length of labor time of stage I between the primigravida pregnant women with the obese category and non-obese category. It can be caused by psychological factors, namely maternal anxiety in the face of labor and maternal exercise (gymnastics pregnant) women done during pregnancy.
2. There is a difference length of labor time of first stage between multigravid pregnant women with the obese category and non-obese category.
3. There is no a difference between length of labor time the second stage both in obese and non-obese category both in primigravida pregnant women and multigravida.
4. There are differences length of labor time of third stage between categories of obese and non-obese both in primigravida pregnant women and multigravida.
5. There is no longer a difference length of labor time at fourth stage between obese category and non-obese both in primigravida pregnant women and multigravida.

SUGGESTION

Based on the research that has been conducted suggested that:

1. For the next researcher may be able to enter the confounding factors affecting research results related to this research into the exclusion criteria.
2. For pregnant women can add information about the effects of obesity before pregnancy to delivery difficulties so as to prevent labor trouble by adjusting BMI and weight gain.
3. For health professionals and institutions hospital can provide additional information as the prevention of complications of childbirth difficulties that will be encountered by mothers due to obesity.

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