
DIFFERENCE IN AVERAGE BABY WEIGHT INCREASE BETWEEN OBESITE AND NORMAL BREASTFEEDING MOTHERS

Oktafiana Manurung

Universitas Efarina Pematangsiantar

Abstract

Background: Obesity is one of the trigger factors for the incidence of non-communicable diseases as well as increasing morbidity in mothers and infants. Obesity experienced by mothers before pregnancy can affect the increase in baby's weight. **Goals:** Analyze differences in the increase in infant weight of obese and normal breastfeeding mothers. **Method:** Observational study with cross sectional design for 30 breastfeeding mothers and their babies in the work area of Pematangsiantar Health Center with consecutive sampling techniques from February to July 2017. Increased body weight was obtained from a 1-month baby weight reduction with baby's birth weight. Data analysis using independent *t* test to see the difference between the two groups of variables. **Results:** There was a difference in the increase in infant weight from obese mothers with normal breastfeeding mothers ($p = 0.023$). **Conclusion:** Lower weight gain in infants of obese mothers. It is recommended for breastfeeding mothers, especially obese mothers, to continue to give exclusive breastfeeding and not to give formula milk or other foods even though the baby's weight gain was slow.

Keywords : Average Increase in Baby Weight Between Obese and Normal Breastfeeding Mothers

INTRODUCTION

Obesity is an important health problem and has become a world health problem. More than 1.9 billion people aged >18 years are overweight and 600 million of them suffer from obesity and 15% occurs in women with a tendency for the increase in obesity rates to be greater in women (1,2). The prevalence of obesity in Indonesia in 2013 was 32.9% in women aged > 18 years while in cities Pematangsiantar reached 39.7% (3.4). (SDKI, 2013; Pematangsiantar City Health Service, 2016; Oghden et al, 2015). Obesity is caused by consuming more food than the body uses as energy, resulting in an excess amount of adipose tissue in the body (Greenstein, B. Wood, DF, 2010). Excessive food, whether fat, carbohydrates or protein, is then stored almost entirely as fat in adipose tissue, to be used as energy. If a person gains weight, the size of the fat cells will increase and then their number will increase and result in obesity (Guyton, AC. Hall, JE, 2008).

Mother's milk (ASI) is an important factor to support the initiation and growth of a baby's composition after birth. Breast milk provides complete nutritional value, namely energy, nutritional and bioactive components which directly influence the baby's growth (Barasi, ME, 2007). Apart from that, breast milk also contains many hormones that play a role in metabolism and growth such as IGFs, ghrelin, leptin, adiponectin, all of these components will be transferred to the baby when breastfeeding (Ballard, O., 2013; Ayidin, S., 2006; Savino, F. ., 2009). Maternal obesity is associated with increased mortality and morbidity in mother and child. Obesity and overweight before pregnancy are risk factors for Diabetes Mellitus (DM), hypertension and preeclampsia in pregnancy. During labor, it is a risk factor for delivery by caesarean section, bleeding, infection and increased mortality during delivery. Babies born to obese mothers tend to experience preterm birth, low birth weight, macrosomia, congenital abnormalities, asphyxia, stillbirth, hypoglycemia and hyperbilirubinemia. Recent studies suggest that high inflammatory responses, both local (adipose tissue, placental and vascular endothelium) and systemic (circulating

plasma concentrations) may also be involved in the impact of obesity in pregnancy (Denison et.al. 2010; Gardner, DG., 2011 ; Andreas, N.J. et al., 2014). The nutritional status of breastfeeding mothers who are overweight can cause the concentration of fat and protein in breast milk to be low, because there is an increase in adipose tissue accompanied by an increase in leptin levels in the blood. Increasing leptin levels in the blood can cause the hormone prolactin to become low, due to the low prolactin hormone causing the mobilization of fat from adipose tissue and the intake of food consumed to enter the mammary glands for the synthesis of milk fat and protein to be low (Anstey and Jevitt, 2011). The aim of this study was to determine the difference in weight gain in babies from obese and normal breastfeeding mothers.

RESEARCH METHODS

This type of observational research uses a cross sectional research design. The research was conducted in the Kartini Pematangsiantar Health Center Work Area. The sampling technique in this study was consecutive sampling and the subjects taken met the inclusion criteria, namely: normal, single and term birth, exclusive breastfeeding for up to 1 month, not suffering from diabetes mellitus, not smoking, having a history of obesity (BMI ≥ 30 kg/m²) before pregnancy for the obese group and a history of normal BMI (18.5-24.9 kg/m²) before pregnancy for the normal group. Exclusion criteria were the baby being sick, dead and the baby being given milk or other additional food. The sample size in this study was 40 breastfeeding mothers and their babies for both groups who were collected from February-July 202.

The researcher has provided an explanation and asked for the consent of the mother as a respondent in this study before conducting the research. The definitions and variables to be studied are: 1) Nursing mothers with a history of obesity before pregnancy (pre-pregnancy BMI ≥ 30 kg/m²) and breastfeeding mothers with a history of normal weight before pregnancy (pre-pregnancy BMI 18.5-24.9 kg/m²) with historical data on maternal nutritional status obtained from records medical pregnancy check book (KIA book). 2) Increase in baby weight is the increase in baby's weight as seen from birth weight until 1 month of age. The baby's weight is measured immediately after the baby is born and after the baby is 1 month old (30 days). The baby's weight was weighed using a Laica brand digital scale that had been recorded and the weighing was carried out by researchers. The increase in baby weight is calculated by subtracting the weight after one month from the weight at birth, the result is divided by birth weight multiplied by 100%. Data normality was tested using the Shapiro-Wilk method. To test differences in normal data distribution, it was analyzed using the independent t test and the Mann-Withney test for abnormal data distribution (Dahlan, MS., 2010).

RESEARCH RESULT

Table 1 shows that there is no difference in birth weight of babies between obese and normal mothers with a value of p=0.068, there is no difference in the weight of 1 month old babies from obese and normal mothers with a value of p=0.364

Table 1. Differences in mean birth weight of babies and the weight of 1 month old babies from obese and normal breastfeeding mothers

Variable	Maternal nutritional status				p
	Normal		Obesity		
	n	Mean±SD	n	Mean±SD	
Baby's birth weight (grams)	20	3258 ±323.70	20	3439 ±281.49	0.068
1 month baby weight (grams)	20	4321.5 ±490.46	20	4201 ±320.79	0.364

DIFFERENCE IN AVERAGE BABY WEIGHT INCREASE BETWEEN OBESITE AND NORMAL BREASTFEEDING MOTHERS

Oktafiana Manurung

Table 2. Difference in mean weight gain for babies from obese and normal breastfeeding mothers

	n	Increase in baby weight (grams) Mean ± SD	p
Normal	20	1059 ± 433,285	0.026
Obesity	20	759 ± 385,922	

Table 2 shows that there is a difference in the mean increase in weight of babies from obese and normal mothers with a p value <0.05 where the increase in weight of babies from obese mothers is less.

DISCUSSION

The statistical test results in Table 2 show that there is a difference in the percentage increase in baby weight where babies of obese mothers have less weight gain. This is in line with research Andreas, NJ., (2016) whoshows that breastfeeding mothers who have a history of obesity before pregnancy tend to increase their baby's weight less than mothers with a normal weight before pregnancy. According to Ode's research, which examined the relationship between the mother's BMI before pregnancy and the baby's growth and body composition. The results obtained by babies of overweight and obese mothers experienced less weight gain, body length and fat mass and concluded that maternal overweight/obesity was associated with premature slowing of linear growth and acrision of the baby's adipose tissue (Ode et al, 2012).

Body weight is the most important and most frequently used anthropometric measurement in newborns. When babies and toddlers, body weight can be used to see the rate of physical growth and nutritional status. Body weight is the result of an increase in all bone tissue, muscle, fat, body fluids and others (Supariasa, 2014). A high body mass index of postpartum mothers will reduce prolactin secretion. The nutritional status of breastfeeding mothers who are overweight can cause the concentration of fat and protein in breast milk to be low, because there is an increase in adipose tissue accompanied by an increase in leptin levels in the blood. Increasing leptin levels in the blood can cause the hormone prolactin to be low, this condition will cause the mobilization of fat from adipose tissue and the intake of food consumed into the mammary glands for the synthesis of milk fat and protein to be low (Anstey, EH. Jevitt, C., 2011)

Babies who receive exclusive breast milk at the age of 0-6 months have a lower body weight compared to babies who receive breast milk and formula milk or other complementary foods at that age, so that the baby's weight gain is not excessive and can prevent obesity in the future. (Zhangbin, et al, 2013). Breast milk is a source of complex nutrition and is very important for babies. Breast milk contains many hormones that play a role in metabolism including the hormones leptin, ghrelin and adiponectin and contains baby growth factors including the growth of the endocrine and circulatory systems (VEGF), nervous system (NGFs), digestive tract (EGF), tissue and bone growth (IGFs).)(Ballard and Morrow, 2013; Khodabakhshi, A. et al, 2015). Breastfeeding is always recommended for babies, because breast milk has complex macronutrient, micronutrient, vitamin, antibody and hormonal components which can prevent obesity in the future (Kon, IY., 2014). The duration and frequency of mothers breastfeeding their babies is an important factor in baby growth, including increasing baby weight (Marseglia et al., 2015). Babies who receive optimal breast milk will experience optimal growth (Marquest et al., 2004).

CONCLUSION

Based on the results of research conducted on 40 breastfeeding mothers with their babies, it was found that the average increase in the weight of babies from obese mothers was less than the increase in the weight of babies from mothers with a normal BMI.

SUGGESTION

It is recommended that breastfeeding mothers, especially obese mothers, continue to exclusively breastfeed and not give formula milk or other foods even if their baby's weight gain is less. It is necessary to further investigate the factors that influence the increase in weight of babies of obese mothers.

REFERENCES

- Andreas, NJ, Hyde, MJ, Gale, C, Parkinson, JR, Jeffries, S, Holmes, E. et al. (2014). Effect of Maternal Body Mass Index on Hormones in Breast Milk: A Systematic Review. *PLOS ONE*, 1-25.
- Andreas, NJ, Hyde, MJ, Herbert, BR, Jeffries, S, Santhakumaran, S, Mandalia, S. et al. (2015). Impact of Maternal BMI and Sampling Strategy on the Concentration of Leptin, Insulin, Ghrelin and Resistin in Breast Milk Across a Single Feed: a Longitudinal Cohort Study. *BMJ Open*, 1-9.
- Anstey, EH, Jevitt, C. (2011). Maternal Obesity and Breastfeeding; A Review of the Evidence and Implications for Practice. *United States Lactation Consultant Association*. 11-16
- Ayidin, S, Ayidin, S, Ozkan, Y, Kumru, S. (2006). Ghrelin is Present in Human Colostrum, Transitional and Mature Milk. *Peptides*, 878-882.
- Ballard, O, Morrow, AL. (2013). Human Milk Composition: Nutrients and Bioactive factors. *NIH Public Access*, 49-74.
- Barasi, ME. (2007). *At a Glance Ilmu Gizi*. Jakarta: Erlangga.
- Dahlan, MS. (2010). *Besar Sampel dan Cara Pengambilan Sampel* (6 ed.). Jakarta: Salemba Medika.
- Denison, FC, Robert, KA, Norman, JE. (2010). Focus Review. Obesity, Pregnancy, Inflammation and Vascular Function. *Center for Reproduction Biology*, 373-385.
- Dinas Kesehatan Kota Pematangsiantar (2016). *Profil Kesehatan Kota Pematangsiantar*.: Dinas Kesehatan Kota Pematangsiantar.
- Ganong, WF. (2008). *Buku Ajar Fisiologi Kedokteran*. Jakarta: EGC.
- Gardner, DG, Shoback, D. (2011). *Greenspan's Basic & Clinical Endocrinology 9th*. Mc Graw Hill Lange
- Greenstein, B, Wood, DF. (2010). *A a Glance Sistem Endokrin*. Jakarta: Erlangga.
- Guyton, AC, Hall, JE. (2008). *Buku Ajar Fisiologi kedokteran Edisi 11*. Jakarta : EGC.
- Jameson, JL, Groot, LJ. (2010). *Edocrinology Adult and Pediatric*. Philadelphia: Saunders Elsevier.
- Khodabakhshi, A, Mobarhan, MG, Rooki, R, Hashemy, SI, Mirhafez, S, Shakeri, MT. (2015). Comparative measurement of Ghrelin, Leptin, Adiponectin, EGF, IGF-1 in Breast Milk of Mothers with Overweight/Obese and Normal-Weight Infants. *European Journal of Clinical Nutrition*, 614-618.
- Kon, IY, Shilina, NM, Gmoshinskaya, MV, Ivanushkina, TA. (2014). The Study of Breast Milk IGF-1, Leptin, Ghrelin and ADiponectin Levels as Possible Reasons of High Weight gain in Breast-Fed Infants. *Annals of Nutrition & Metabolism*, 317-323.
- Marcadante, KJ, Kliegman, RM, Jenson, HB, Behrman, RE. (2011). *Nelson Essentials of Pediatrics 6 edition*. Philadelphia: Saunders Elsevier.
- Marseglia, L, Manti, S, D'Angelo, G, Cuppari, C, Salpietro, V, Filippelli, M. et al. (2015). Obesity and Breastfeeding: The Strength of Association. *Women and Birth*, 81-86.
- Maryunani, A. (2012). *Inisiasi Menyusui Dini ASI Eksklusif*. Jakarta: TIM.
- Marquest, RFSV, Lopez, FA, Braga, JAP. (2004). Growth of Exclusively Breastfed Infants in the First 6 Months of Life. *Journal de Pediatria*.
- Ode, LK, Gray, HL, Ramal, SE, Georgieff, MK, Demerath, EW. (2012). Decelerated Early in Infants of Overweight and Obese Mothers. *The Journal of Pediatrics*, 1028-1034.

***DIFFERENCE IN AVERAGE BABY WEIGHT INCREASE BETWEEN
OBESITE AND NORMAL BREASTFEEDING MOTHERS***

Oktafiana Manurung

-
- Ogden, CL. Carrol, MD. Fryar, CD. Fiegal, KM. (2015). Prevalence of Obesity Among Adults and Youth: United Stated, 2011-2014. *NCHS Data Brief* , 1-7.
- SDKI. (2013). Survey Demografi dan Kesehatan Indonesia 2012. Jakarta: Kementerian Kesehatan Republik Indonesia.
- Sudoyo, AW. Setyohadi, B. Alwi, IK. Setiati, S. (2006). *Buku Ajar Ilmu Penyakit Dalam*. Jakarta: Pusat Penerbitan Departemen Ilmu penyakit Dalam Fakultas Kedokteran Universitas Indonesia.
- Supriasa, ID. Bakri, B. Fajar, I. (2014). *Penilaian Status Gizi*. Jakarta: EGC.
- Zhangbin, Y. Shuping, H. Jingai, Z. Xiaofan, S. Chenbo, J. Xirong, G. (2013). Pre-Pregnancy Body mass Index in Relation to Infant Birth Weight and Offspring Overweight/Obesity: A Systematic Review And Meta-Analysis. *Nanjing Medical University*. 616-627