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Birth Outcomes Of Maternal Morbid Obesity

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ABSTRACT

Background: The prevalence of pregnancy with morbid obesity has increased in the last decade which caused complications for both the mother and fetus. The aim of this study was to find out the birth outcomes of pregnant women with morbid obesity who gave birth at Dr. Soetomo General Hospital, Surabaya from 2013 to 2015.
Methods: This was a descriptive study on pregnant women with morbid obesity (BMI ≥40 kg /m^2) who gave birth in the delivery room of Dr. Soetomo General Hospital, Surabaya from January 2013 to June 2015.
Results: There were 3986 deliveries during the study period with 297 (7.4%) deliveries with obese mothers. The births with morbid obesity were in 42 mothers (14%). The range of BMI was 40.17-59 kg/m^2 with median of 45.86 kg/m^2. Caesarean section was the most mode of delivery in mothers with morbid obesity as many as 36 mothers (85%). The options of anesthesy in mother with morbid obesity were general anesthesia and subarachnoid block, 9 (25%) and 27 (75%), respectively. The childbirth in mother with morbid obesity spend an average of 69.60 minutes for cesarean delivery with the average time of incision until the birth of a baby 8.67 minutes. Most Apgar score group of infants was in 7-10 group.
Conclusion: The birth outcomes of morbidly-obese pregnant women were caesarean section delivery, long duration in delivery, and normal birth weight.

Keywords: Morbidly obese pregnancy, maternal and neonatal outcome

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INTRODUCTION

Obesity is a condition of accumulation of excess body fat, so a person's weight is far above normal and can endanger health. Whereas overweight is a condition where a person's body weight exceeds normal. Obesity is risk factor for metabolic syndroms which is related to the increased risk of various non-communicable diseases (NCDs) (1). Obesity in pregnancy is generally defined as a Body Mass Index (BMI) ≥30 kg/m^2 since the first trimester or before pregnancy (2). BMI is obtained by dividing body weight in kilograms, divided by height squared in meters (3). Table 1 presents category of BMI.
Morbid obesity or extreme obesity is one class of BMI in obesity that is grade III obesity with BMI ≥ 40 kg/m^2. Pregnant women with obesity account for 28% of all pregnancies with 8% categorized as morbid obesity, and the number of sufferers has increased every year. This situation shows a very serious condition considering the complications caused by both the mother, fetus, neonates and potential complications that can be caused in the next life and will require more costs economically (2).
Complications that can be experienced by pregnant women with morbid obesity include the risk of thromboembolism, preeclampsia, eclampsia seizures, and increased labor induction rates (4). Whereas labor with induction increases the number of operations and all the risks of surgery. Surgical procedures for obese pregnant women are also not easy, related to pannus or large folds of abdominal fat, difficulty reaching the uterus and delivery of the fetus, and the risk of postoperative healing (5,6).
The number of pregnant women with obesity increased and is easily found in daily practice in Surabaya as one of the major cities in Indonesia. The threat of complications as mentioned above is a major problem in the field of obstetrics because the circle of obesity, metabolic diseases, and risk to the fetus are increasing. Delivery assistance is needed by adequate health workers in an adequate health facility because if complication occurs, such as preeclampsia, it can be treated immediately (7). The aim of this study was to find out the birth outcomes of pregnant women with morbid obesity who gave birth at Dr. Soetomo General Hospital, Surabaya from 2013 to 2015.

METHODS

This was a desriptive study conducted in dr. Soetomo General Hospital, Surabaya. The subjects were pregnant women with BMI ≥30 kg/m^2 who gave birth during period January 2013 to June 2015. The data were taken from maternal and infant registration records in the delivery room at dr. Soetomo General Hospital, Surabaya and tracking of patient medical records. The pregnant women's data who had BMI ≥40 kg/m2 were categorized and analyzed. All data were presented in tables descriptively.

RESULTS AND DISCUSSION

Table 2 shows the characteristics of subjects. During January 2013 to June 2015, the total number of pregnant women visiting Dr. Soetomo General Hospital was 4552 pregnancies with a total number of 3986 deliveries. Births with obese mothers were 297 births (7.4%), with

grade I, II, and III of obesity, 150 (51%), 105 (35%), 42 (14%), respectively. Based on parity, the highest proportion of obesity in grade I, II and III in multigravida pregnancy was 86 (57%), 66 (63%), 31 (73%), respectively.

This study found the number of infant born from obese mothers as many as 304 infants, from obese mothers grade 1, grade 2, grade 3 of obesity as many as 150 infants, 110 infants, 44 infants, respectively. As shown in Table 3, most infants which born from obese mothers were in weight of 2000-3990 grams. Based on Apgar Score (AS), most infants had score in group 7-10.

Based on Table 4, this study obtained 42 labors of morbidly obese mothers from January 2013 to June 2015. Thirty-one cases of this labor were non-booked. From forty-two labors, the range of mothers' BMI was 40.17-59 kg/m^2 with median of 45.86 kg/m^2. Based on delivery, caesarean section was the most delivery method used in mothers with morbid obesity as many as 36 mothers (85%). The options of anesthesy in mother with morbid obesity were general anesthesia and subarachnoid block, 9 (25%) and 27 (75%), respectively. The infants' birth weight of morbid obesity mothers was 27 (65%). The childbirth in women with morbid obesity had a difficulty level either when opening the abdominal wall, giving birth to the fetus, or to the act of closing the surgical wound. Dr. Soetomo Hospital spent an average of 69.60 minutes for caesarean delivery in morbid obesity with the time of incision until the birth of a baby on average of 8.67 minutes. Most Apgar score group of infants was in 7-10 group.

The birth outcomes of morbidly obese pregnant women were caesarean section delivery, long duration in delivery, and normal birth weight. Abdominal wall incision selected was pfannenstiel incision. There were no cases of thromboembolism in morbid obesity, and no heparin was administered during treatment.

Pregnancy and childbirth with obesity are new problems and increasingly threatening the health of mothers and infants. This obesity in pregnancy has risk to preeclampsia, which is a major cause of maternal morbidity and mortality (8). If the medical treatment delays, including delay in identified pregnancy risk and dangerous sign, accessibility to health facilities, and taking good health services, maternal mortality may occur (9). The increasing number of people with obesity leads to an increase in women of childbearing age who start pregnancies with obesity. Several international studies and data stated the prevalence of obesity with a BMI reference value ≥ 30 kg/m2, ranging from 1.8 to 25.3% in the general population (10). The childbirth with morbidly obese prevalence was 7.4% in this study. Based on The National Health and Nutrition Examination Survey (NHNES), the most of maternal-obese prevalence in USA was in the fertile age between the ages of 20-39 years with age categories of 20-29, 30-39,40-49 as many as 23.3%, 32.5%, dan 35.4%, respectively (11). It was similar to this study that found the most obesity grade prevalence in age categories of 20-34 years. Whereas, in morbidly obese, most of pregnant women was >35 years.

Obesity is also more common in multigravidas compared to that in primigravidas. This is consistent with several other studies that postpartum weight retention affects the weight of subsequent pregnancies (12). The impact of obesity is not only on labor when the patient is pregnant but can affect the fetus, fetal health in the future, and be a risk factor for cardiovascular disease for both the mother and the infant.

Pregnancy with morbid obesity presents a new challenge for surgeons in their daily handling. The high number of disease complications is associated with morbid obesity, such as preeclampsia and eclampsia, DM Gestational, fetal macrosomia. These complications cause the number of surgical operations in the group of obese patients to increase. Difficulties in anesthesia and surgery in patients and the risk of surgical wounds that are difficult to heal require the handling of scientific collaboration to achieve optimal results and reduce maternal morbidity (13,14).

In this study, pregnant women with morbid obesity at the term of gestational age performed caesarean section (CS) at 38/39 weeks' gestation. Mothers without other indications required earlier termination because caesarean deliveries can increase maternal complications (15). Abdominal incisions were carried out by pfannenstiel with the maternal abdominal pannus pulled toward the cephalad. The incision was made 2 cm above the fold of the skin (16). The literature states that the incision method in morbid obesity can be done with pfannenstiel incision, transversal infra, or supraumbilical incision. Some references do not mention a standard approach to action in women with morbid obesity. The online source of UpToDate recommends that the action of obesity in morbid obesity can be done pfannenstiel if the pannus can be retracted upwards and does not complicate patient respiration. Preoperative antibiotics and minimal manipulation of the fat layer are used. Surgical wounds can be closed with skin staples to make seroma flow not accumulating in the operating area. Another advantage of pfannenstiel incision is that access to the lowest part of the fetus is easier when labor is in stage II, and the lowest part of the fetus is far away at the base of the pelvis. Pannus found that is edema, infected, or too large to be elevated may interfere with the patient's respiration, then an alternative incision is recommended, namely the transverse or midline supraumbilicus incision. However, the transverse or midline supraumbilicus incision is at risk for classic or vertical incisions in the uterus that will affect subsequent surgical operations and a higher risk of spontaneous uterine rupture in subsequent pregnancies compared to pfannenstiel incisions (OR 24.6; 95% CI 9.0-66.8) (17,18). It is also worth considering that a midline incision carries the risk of injury and infection. However, more extensive research on midline and pfannenstiel incisions in surgical wound infections in morbid obesity is not yet available. Data from several studies also did not mention the location of the surgical wound as well as the approach to the suturing technique that was done, so it cannot be concluded that the midline incision caused the licensing of the surgical wound. Thus, the inter-case approach needs to be considered (16).

In the abdominal incision, a layer of fat is covered with a thread that is easily absorbed, and in the pfannenstiel incision hidden behind the pannus, a subcutan suction drain is installed with negative pressure to absorb the seroma where the thickness of the subcutaneous fat is more than 2 cm. Although some literatures do not support the installation of subcutaneous drainage because it is a route for germs associated with an increased risk of surgical wound infections, the controversy regarding installation of subcutaneous drainage has not been much studied (19). Suction drain selection is recommended based on clinical assessment of the state of surgical wound. In the transverse or midline supra-umbilical incision, the risk of infection is smaller than that in the pfannenstiel incision because the slices

located behind the pannus tend to be moist and easy to get dirty (17,18). This study found the morbid obesity women who got infection after caesarean delivery had other severe comorbid diseases, such as lung infections, anemia and burst abdomen. In some cases, women get infection after caesarean delivery caused by gastroduodenal perforation due to peptic ulcer disease, although it is rare (20,21).

Anesthetic measures during surgery in patients with morbid obesity are at risk for complications from regional anesthesia. Difficulty of positioning the patient during spinal needle insertion, thick subcutaneous fat, and difficulty of determining the puncture needle position will prolong the anesthesia of regional blocks and are prone to failure. This situation does not save time when emergency surgery is needed, such as a state of fetal distress. Whereas, intubation is often constrained by the difficulty of intubation techniques due to the short neck of obese patients, the presence of obstructive apnea, and the risk of gastric acid reflux and postoperative ateletaxis (22,23). In this study, the anesthesia was performed in a subarachnoid regional block (SAB) which was different from the external literature that performed epidural blocks and the administration of continuous epidural anesthesia. Continuous regional anesthesia with epidurals is very useful if there is an extended operation by adding drugs through an epidural catheter. So, epidural placement has been frequently done before the patient's inpartu or when it was decided to end the pregnancy. Furthermore, communication with the anesthesiologist in the management of morbid obese patients is needed before deciding on delivery in obese morbid mothers (22).

The increase in BMI is related to the lengthening of the time interval from the abdominal wall incision to the delivery of the fetus. Previous study stated that the time taken for incision until delivery of the fetus at a BMI of 50 kg/m^2 was 1.6 times longer than that of a normal weight mother. Whereas, the BMI of 40-49.9 kg/m^2 required from the incision to deliver the fetus took 13.0 ± 8.0 minutes (12) In this study, the shorter time needed was an average of 8.67 minutes. However, previous study did not reveal operation indication, incision type, techniques to open the abdominal wall, and the installation of pannus retractor aids, which greatly affect the time of incision to delivery (12). In this study, we did not compare with normal BMI data because of the limited records we have. Thus, we cannot state the BMI associated with a longer time for incision until fetal delivery.

Pregnancy outcomes in mothers with morbid obesity obtained fetal weight of 2000-3999 grams, occupying the highest prevalence of 65%. The several studies mentioned pregnant womens with morbid obesity had an odd birth for small babies during low pregnancy and tended to have babies with a large birth weight during pregnancy. This is related to the relationship of obesity with gestational diabetes. The risk of fetal IUFD and birth with a bad score is related to comorbidities or complications that often accompany pregnancy, especially with morbid obesity.

In conclusion, the birth outcomes of morbidly obese pregnant women were caesarean section delivery, long duration in delivery, and normal birth weight. Abdominal wall incision selected was pfannenstiel incision. There were no cases of thromboembolism in morbid obesity, and no heparin was administered during treatment. Interdisciplinary preparation and discussion are needed in the management of patients with morbid obesity, including the preparation of standards for handling morbid obesity. Thus, optimal maternal and fetal outcomes may be obtained

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Tabel 1. Body Mass Index (2,3)

Categories	BMI (kg/m^2)	Obesity Grades
Underweight	< 18.5	
Normal	18.5-24.9	
Overweight	25.0-29.9	
Obese I	30.0-34.9	I
Obese II	35.0-39.9	II
Morbidly obese	≥40.0	III

Tabel 2. Characteristics of Maternal Obesity (n=297)

Characteristics	**Obesity Grades n (%)**		
	Grade I (n= 150)	**Grade II (n = 105)**	**Grade III (n = 42)**
Age (years)			
≤19	3 (2)	2 (2)	1 (2)
20-34	113 (75)	74 (70)	23 (55)
≥ 35	34 (22)	29 (28)	18 (43)
Parity			
Primigravida	55 (36)	39 (37)	9 (21)
Multigravida	86 (57)	66 (63)	31 (73)
Grandemultipara	9 (6)	0	2 (4)
Mode of Delivery SC	71 (47)	59 (56)	36 (85)

BMI Body Mass Index. Obesity: grade I BMI= 30.0-34.9 kg/m^2; Grade II BMI=35.0-39.9 kg/m^2; Grade III BMI ≥ 40 kg/m^2

Table3. Characteristics of Neonatal Born to Maternal Obesity (n=304)

Neonatal Characteristics	**Maternal Obesity n (%)**		
	Grade I (n= 150)	**Grade II (n = 110)**	**Grade III (n = 44)**
Birth Weight (gram)			
<1500	20 (13)	24 (22)	10 (23)
1500-1990	16 (11)	28 (25)	2 (5)
2000-3990	107 (71)	50 (46)	29 (65)
>4000	7 (5)	8 (7)	3 (7)
APGAR Score			
0 – 3	46	35	12
4 – 6	24	29	10
7 – 10	80	46	22

Tabel 4. Childbirth with morbid obesity

Variables	**Childbirth with Morbid Obesity (N=42)**
Visit	
NBC*/BC**	31/11
BMI (Kg/m^2)	
Median (range)	45.86 (40.17 – 59.00)
Delivery	
SC	36 (85%)
Pervaginam	6 (15%)
Anesthesia	
GA	9 (25%)
SAB	27 (75%)
Incision, n (%)	
Midline	3 (8%)
Pfannenstiel	33 (92%)
Birth weight	
Mean (gram)	2804.8
Macrosomia (>4000 gram), n	3
Treatment duration (day)	2 – 12
Mean	6.3
Complications of surgical wound infections (n ;%)	3 (7%)
Duration of SC (minutes)	
Mean	69.60
Incision to delivery time (minutes)	5-15 (8.67)

APGAR Score	
0-3	12
4-6	10
7-10	22

*NBC: Non-Booked Case: ANC <3; **BC: Booked Case: ANC >3; BMI: Body Mass Index; SC: Sectio Cesarean; GA: General Anesthesia; SAB: Subarachnoid Block