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 normal and can endanger health. Whereas overweight is a condition where a person’s body weight exceeds normal. Obesity is risk factor for metabolic syndrome 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/m² 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 II obesity with BMI ≥ 40 kg/m². 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).

Methods: This was a descriptive study conducted in dr. Soetomo General Hospital, Surabaya. The subjects were pregnant women with BMI ≥30 kg/m² 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...
Outcomes and cardiovascular recommends obesity be infants may and for used. maternal in with is as fetal will the handling obesity is the cephalad. The subsequent treatment of grade 4, opening to health to study references respiration, is from 24.6; 20-39 challenge infants, (73%) cases daily obesity is respectively ≥ to obese baby and on studies years. non-booked. and with 3, inter-case age and affect do edema, of patients fetus, based obesity above pregnant is not in 27 most it difficulty incision. rupture accumulating 105 elevated a of (75%), obesity. pulled abdominal of incisions retention 2015. incision the of midline is birth delivery not surgical Soetomo morbid section approach and score factor hidden the a 45.86 mortality in infections many this with only sign, that can of route 66 surgery categories with mothers away increasing higher issue weeks' anesthesia long obesity method of facilities, giving 42 subsequent thickness pfannenstiel childbirth reference accessibility the major as slices made incision pfannenstiel of obese, that of general of obese were the mother was morbidly (16) maternal-obese obesity and obesity, 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
Birth Outcomes Of Maternal Morbid Obesity

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
atelectasis (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 has stated that the time
taken for incision until delivery of the fetus at a BMI of 50
kg/m² was 1.6 times longer than that of a normal weight
mother. Whereas, the BMI of 40-49.9 kg/m² 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 women 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 pannensiel 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)

<table>
<thead>
<tr>
<th>Categories</th>
<th>BMI (kg/m²)</th>
<th>Obesity Grades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>&lt; 18.5</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>18.5-24.9</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>25.0-29.9</td>
<td></td>
</tr>
<tr>
<td>Obese I</td>
<td>30.0-34.9</td>
<td>I</td>
</tr>
<tr>
<td>Obese II</td>
<td>35.0-39.9</td>
<td>II</td>
</tr>
<tr>
<td>Morbidly obese</td>
<td>≥ 40.0</td>
<td>III</td>
</tr>
</tbody>
</table>

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

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

BMI Body Mass Index. Obesity: grade I BMI = 30.0-34.9 kg/m²; Grade II BMI = 35.0-39.9 kg/m²; Grade III BMI ≥ 40 kg/m²

Table 3. Characteristics of Neonatal Born to Maternal Obesity (n=304)

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

Tabel 4. Childbirth with morbid obesity

<table>
<thead>
<tr>
<th>Variables</th>
<th>Childbirth with Morbid Obesity (N=42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visit</td>
<td>NBC* / BC**</td>
</tr>
<tr>
<td>BMI (Kg/m²)</td>
<td>Median (range)</td>
</tr>
<tr>
<td>Delivery</td>
<td>SC</td>
</tr>
<tr>
<td></td>
<td>Pervaginam</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>GA</td>
</tr>
<tr>
<td></td>
<td>SAB</td>
</tr>
<tr>
<td>Incision, n (%)</td>
<td>Midline</td>
</tr>
<tr>
<td></td>
<td>Pfannenstiel</td>
</tr>
<tr>
<td>Birth weight (gram)</td>
<td>Mean (gram)</td>
</tr>
<tr>
<td></td>
<td>Macrosomia (&gt;4000 gram), n</td>
</tr>
<tr>
<td>Treatment duration (day)</td>
<td>Mean (day)</td>
</tr>
<tr>
<td></td>
<td>Mean (months)</td>
</tr>
<tr>
<td>Complications of surgical wound infections (n ;%)</td>
<td>3 (7%)</td>
</tr>
<tr>
<td>Duration of SC (minutes)</td>
<td>Mean (minutes)</td>
</tr>
<tr>
<td>Incision to delivery time (minutes)</td>
<td>Mean (minutes)</td>
</tr>
</tbody>
</table>
## Birth Outcomes Of Maternal Morbid Obesity

<table>
<thead>
<tr>
<th>APGAR Score</th>
<th>0-3</th>
<th>4-6</th>
<th>7-10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12</td>
<td>10</td>
<td>22</td>
</tr>
</tbody>
</table>

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