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Contact
Archives
Current Issue

FAQ
Guidelines
Submit Papers
Review Process

Advertising policies
Conflicts of Interest
Complaints and appeals
Corrections and Retraction
more...

Legal

About Us
Terms of Use
Privacy & Policies

10.53555/V24I9/40022945032-45041
A Study of suicidal ideation in different subgroups within a sexual minority by assessing variables that may reflect subjective experience of distress among minorities
Dr.Akash Parihar
LGBTQ
Suicidal ideation
Thwarted belongingness
Perceived burdensomeness
144

25

10.53555/V24I9/40022545022-45031
Assessment of Educational Programs Designed to Enhance Students' Mental and Social Well-Being: A Comprehensive Review
Dr. Harshal G. Vashi
Evaluation
health promotion
health promotion education
mental health
schools
social health
49

11

10.53555/V24I9/40022445020-45021
The Journey Within: Sri Aurobindo's vision in Savitri
Dr. R Krishnamohan
Myth
Savitri A Legend and a Symbol
spiritual journey
42

10

10.53555/V24I9/40022245015-45019

Integration of Indigenous Knowledge in School Education and NEP-2020
B. Sagarika
Indigenous knowledge
Education
National education policy
Integration
58

15

10.53555/V24I9/40022145009-45014
Information And Communication Technology And Government During Covid-19
Mante Sakachep
ICT
Covid-19
government and people.
48

13

10.53555/V24I9/40020145002-45008
Degradation Study Of Sofosbuvir In Bulk Drug And Tablet Dosage Form By RP-High Performance Liquid Chromatography
Sushil D. Pati
Sofosbuvir
RP-HPLC
Method Development
Method Validation
Stability.
59

20

10.53555/V24I9/40017644995-45001
Challenges Of Public Educational Institution Management By The Head Of The Institutions In Assam
Suhrid Sinha
Education
management
teacher's role
issues
challenges
formal mode.
58

23

10.53555/V24I9/40016044989-44994
An Evaluation Of The Level Of Dental Awareness Among The School-Age Population In Central India

37

13

10.37200/V24I9/232651796-1805
BIRTH OUTCOMES OF MATERNAL MORBID OBESITY
HERMANTO TRI JOEWONO, AGUS SULISTYONO, NI KETUT ANNY KARTININGSIH, ADITIAWARMAN
Morbidly obese pregnancy
maternal and neonatal outcome
56

16

10.37200/V24I9/232311786-1795
EXPLORING PERINATAL DEATH CHARACTERISTICS AT DR. SOETOMO GENERAL HOSPITAL, SURABAYA FROM 2014 TO 2015
HERMANTO TRI JOEWONO, AGUS SULISTYONO, RATIH WARDANI, ADITIAWARMAN
characteristics
perinatal deaths
postnatally
prematurity
hypertensive disease in pregnancy
73

13

10.37200/V24I9/230521778-1785
Prevalence of Endoparasites among Liza abu Fishes in a Private Farm in Babylon Province Iraq
Fadhil H.A. Al-Dulaimi, Ahmed. K. A . Al-Hamairy, Aussama A. M. Al-Ajeely
Prevalence of Endoparasites
Fishes in a Private Farm
Babylon Province Iraq
57

12

10.37200/V24I9/230511765-1777
The effect of complex exercises (physical skill) in developing response speed and blocking wall for beach volleyball players
Hatem Falih Hafith, Firas Kassoub Rashid
Complex exercises
developing response speed
beach volleyball players
36

14

10.37200/V24I9/230501756-1764

Psychological factors associated with medication noncompliance in schizophrenic patients who attending psychiatric teaching hospitals
Fatin Ghani Ashoor, Saja Hashim Mohammed
psychological factors
medication non- compliance
schizophrenic patients.
41

15

10.37200/V24I9/230481748-1755
Common Risk Factors related Toxoplasmosis Infection during pregnancy
Wafaa Ahmed Ameen, Saadya Hadi Humade
Risk factors
infection
Pregnancy
intracellular
parasite
Toxoplasma
38

13

10.37200/V24I9/230471743-1747
Evaluation of Teachers' Knowledge about the Early Detection for Hepatitis Type (A) at the Primary Schools in Al-Hilla City
Ali F. Abdul Hussein
Evaluation
Teachers' Knowledge
Hepatitis (A) Diseases.
39

12

10.37200/V24I9/230461736-1742
Psychosocial Impact of Adolescents with Juvenile Diabetes Long-Term At Al Nasiriya Diabetic and Endocrinology Center
Adil Ali Hussein, Khetam Mutasher Hatab
Psychosocial
juvenile diabetes
long-term treatment
adolescents
48

10

10.37200/V24I9/230451729-1735
Evaluating Knowledge and Practices of Pregnant Mother's Regarding Antenatal Care Who Attending Primary Health Care Centers In Al Hillah City
Muna Abdulwahab Khaleel

Stay up to date with all Psychosocial news

Quick Links

ContactArchivesCurrent Issue

Resources

FAQGuidelinesSubmit PapersReview Process

Journal Policies

Advertising policiesConflicts of InterestComplaints and appealsCorrections and Retractionmore...

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About UsTerms of UsePrivacy & Policies

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Home / Journal Policies / Editorial Board

▸ Table of Content

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Archives
Current Issue

FAQ
Guidelines
Submit Papers
Review Process

Advertising policies
Conflicts of Interest
Complaints and appeals
Corrections and Retraction
more...

Legal

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EXPLORING PERINATAL DEATH CHARACTERISTICS AT DR. SOETOMO GENERAL HOSPITAL, SURABAYA FROM 2014 TO 2015

[1] HERMANTO TRI JOEWONO, [2] AGUS SULISTYONO, [3] RATIH WARDANI, [4] ADITIAWARMAN

ABSTRACT

Introduction: *There are several risk factors for perinatal death. This study aimed to explore the characteristics of perinatal mortality at Dr. Soetomo General Hospital, Surabaya from 2014 to 2015.*
Methods*: This was a descriptive study. Maternal and perinatal data were taken from the medical records.*
Results*: The total perinatal death was 285 cases of all deliveries at Dr. Soetomo General Hospital, Surabaya in 2014-2015. Most women were in maternal age of 17-34 years. The maternal education was mostly high school, and most mothers were unemployed. More than a half of maternal parity was multigravida (63.5%), and the gestational age was preterm or under-month gestation at 81.4%. Most infants (73.3%) had low birth weight, and most cases were born vaginally. The majority of cases were non-booked case (NBC). Most of perinatal mortality was caused by prematurity followed by asphyxia, and the maternal factor was preeclampsia/eclampsia.*
Conclusion*: Perinatal deaths mostly occurred in postnatal with the main causes of prematurity and asphyxia and the maternal factor was preeclampsia/eclampsia.*

Keywords: *characteristics, perinatal deaths, postnatally, prematurity, hypertensive disease in pregnancy*

INTRODUCTION

WHO states that the perinatal period is the period of 22 weeks gestation until the baby is 7 days after birth. Most baby deaths are thought to occur in this period, so they are called perinatal deaths. The results show that every year over 4 million babies die in the first four weeks of life; 3 million of these deaths occur in the early neonatal period. Ninety-eight percent of the deaths take place in the developing world (1). Another report said the risk was highest in sub-Saharan Africa, but the number of deaths was highest in South Asia (2).

There are several factors that are suspected to be risk factors for perinatal death. Several studies have shown that the factors causing perinatal death are infection, maternal age, low birth weight (LBW), history of maternal disease, incomplete antenatal care (ANC), low family income, the presence of congenital abnormalities, asphyxia,

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birth complications, prolonged labor, prolonged labor, preeclampsia, and eclampsia (3). Previous report also showed that neonatal tetanus was associated with mortality (4).

Based on Demographic and Health Survey report of Indonesia in 2012, determinants of perinatal mortality consisted of respiratory disorders, prematurity, sepsis, hypothermia, jaundice, and congenital abnormalities (5). Study in 2012 found that most of perinatal mortality was caused by prematurity, which was 75.54 percent or 139 babies out of the total deaths studied (6). The previous study found that the key factors associated with mortality perinatal are premature birth, the size of a small birth weight for gestational age, anemia, and adherence to the program of the ANC (7). Another study stated that birth injury and asphyxia and prematurity are the main causes of perinatal death, while demographic factors that are thought to contribute to perinatal mortality are maternal age, parity, labor intervals, socioeconomic status, and others (8). Therefore, this study aimed to explore the characteristics of perinatal mortality at Dr. Soetomo General Hospital, Surabaya from 2014 to 2015.

METHODS

This was a descriptive study of the characteristics of perinatal deaths that conducted in dr. Soetomo General Hospital, Surabaya from January 1, 2014 to December 31, 2015. Maternal and perinatal data were taken from the medical records. Inclusion criteria were all cases of perinatal period death. Exclusion criteria were incomplete medical records and weekly report records. Variables in this study were the characteristics of perinatal mortality based on maternal factors, such as age, education, employment status, parity, gestational age, ANC status, mode of delivery, and maternal diseases, while the perinatal were birth weight and complications which cause death in perinatal. Data analysis was descriptive and presented in tables.

RESULTS

Tables 1 and 2 present the results obtained in 2014 of the total 1325 deliveries which show total 141 perinatal deaths (10.6%). They were divided into antenatal deaths of 58 (41%) cases, intranatal of 16 (11%) cases, and postnatal of 67 (48%) cases. Whereas, in 2015, there were 144 (12.6%) cases of perinatal mortality, divided into antenatal deaths of 57 (40%) cases, intranatal of 28 (19%) of cases, and postnatal of 59 (41%) cases of 1147 total deliveries. The total perinatal death was 285 cases of all deliveries at Dr. Soetomo General Hospital for two years.

Table 3 shows the characteristics of perinatal mortality based on maternal age, maternal education, and employment status. Most women were in maternal age of 17-34 years. The maternal education was mostly high school, and most mothers were unemployed.

The perinatal mortality characteristics based on parity, gestational age, birth weight, and mode of delivery are shown in Table 4. The majority of maternal parity was multigravida, which was 63.5%, and the gestational age was preterm or under-month gestation at 81.4%, while the perinatal mortality at postterm gestational age was only 1.1%. Most infants had low birth weight of less than 2000 g, which was 73.3%, and most cases were born vaginally.

Table 5 shows the history of antenatal examinations carried out. It was found that the majority of cases was Non Booked Case (NBC) or most were referral cases that had not previously conducted ANC examination at Dr. Soetomo General Hospital. Whereas, Table 6 displays the results of the characteristics of perinatal mortality based on cause of death and maternal diseases that contribute to perinatal death. The most common cause of perinatal mortality was prematurity of 34.4%, followed by asphyxia by 20.4% and 16.1% of congenital abnormalities.

DISCUSSION

The most common cause of perinatal mortality is prematurity. The incidence of preterm birth is a risk factor for perinatal death events with OR of 15.06 compared to babies born normally (9). Premature babies are also more at risk than normal babies to experience perinatal death with a risk of 4.61 times (10). Besides, maternal factor is preeclampsia/eclampsia. Pre-eclampsia/eclampsia cases are the most cases of maternal disease which contribute to perinatal mortality.

The perinatal mortality in 2015 slightly increase as much as 12% compared to the previous year, and most of them were postnatal (age 1-7 days after birth), but the number of antenatal deaths did not differ much with postnatal death. The risk of respondents with the use of ANC services who are not complete to experience perinatal death is 4.08 times compared to respondents who use the ANC service which is complete (11).

This study found that most infants were in LBW cases. The risk factors of LBW cases are age pregnancy, multiple pregnancy, hypertension and anemia (12). Another study also reported that the newborn weight status was

most influential factor on neonatal death in Muna, Indonesia with odds ratio (OR) of 22.548 (95% CI:6.515-78.036) (13).

The most common cause of perinatal mortality is prematurity, followed by asphyxia, and congenital abnormalities. Infants born prematurely have a higher risk of perinatal death when compared to inftants born at term because infants born prematurely tend to have difficulty adapting to life outside the womb due to immature body systems. Another report also showed that the incidence of preterm birth was very closely related to perinatal death. Prematurity resulted in perinatal mortality, which is equal to 24 percent (14). These results were in line with a cohort study which presented that 75.54 percent of perinatal deaths were caused by premature births (6). Another report also found that 47 percent of preterm births resulted in perinatal death (15). The same results were also obtained from bivariate analysis results which showed the incidence of preterm birth was a significant risk factor for perinatal death with OR = 2.58 (16).

These findings in the case of asphyxia neonatorum were supported by previous studies which said that the main cause of perinatal death was neonatal asphyxia (3). In addition, another report said both in vaginal and caesarian delivery, most important causes of neonatal complication were moderate and sever asphyxia, respectively (17).

While in the case of congenital anomalies, these findings were slightly different with a study in Columbia. That study stated that congenital anomalies were an important cause of fetal and neonatal deaths in Colombia. The most frequent fatal congenital anomalies were congenital heart defects (32.0%), central nervous system anomalies (15.8%), and chromosomal anomalies (8.0%) (18). Congenital heart disease (CHD) is the leading cause of death in the first year of life (19). Other studies said that the most frequent of malformations and deformations were those of the musculoskeletal system (19.6%), followed by the nervous system (18.8%), the digestive system (18.7%), the circulatory system (12.9%), and the cleft lip and cleft palate (8.2%). Congenital anomalies can be one of the risk factors either in the increase of morbidity and mortality rate in newborn infant, or in the future growth and development disorder of a child.(20) In addition, there are some rare cases such as anomalous congenital bands which may cause serious morbidities due to ischemic intestinal which contribute 3% of total cases (21).

Pregnancy complications are an obstetric emergency that can cause maternal and perinatal mortality. Whereas, the complications of childbirth is a state of deviation from normal which directly causes morbidity and death of both mother and infant due to interference directly due to childbirth. Various studies have found that complications are related to perinatal period mortality. Research conducted in Sao Paulo-Portugal concluded that mothers who experience pregnancy complications are at risk for perinatal death (22).

Whereas, a cohort study in Pakistan found that premature rupture of membranes, prolonged labor, and maternal infections were the risk factors for perinatal death in Pakistan (23). Based on study in various countries, about the relationship of 16 types of complications of pregnancy and childbirth to perinatal death, there are 3 types of complications that are at risk of causing perinatal death, namely placental abruption, uterine rupture, and pre-eclampsia (24). The results of this study were consistent with previous studies, where pre-eclampsia was a risk of perinatal death with an OR value of 1.72 (25).

CONCLUSION

Based on trend of perinatal mortality in 2014-2015, perinatal deaths occurred mostly in postnatal. The causes of perinatal mortality were prematurity, respiratory disorders at birth (birth asphyxia, respiratory distress syndrome, meconium aspiration), as well as congenital abnormalities and neonatal sepsis. The maternal factor such as preeclampsia/eclampsia still requires special attention because it contributes to perinatal mortality.

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Tables

Table 1. Frequency distribution of Perinatal Mortality

Year	Perinatal Death	Total Delivery
2014	141 (10.6%)	1325
2015	144 (12.6%)	1147

Table 2. Frequency distribution of types of perinatal deaths

Types of perinatal deaths	2014		2015	
	n	%	n	%
Antenatal	58	41	57	40
Intranatal	16	11	28	19
Postnatal	67	48	59	41
Total	141	100	144	100

Table 3. Characteristics of perinatal mortality based on socio demographic

Characteristics	n	%
Age (years)		
≤ 16	3	1.1
17-34	226	79.2
≥ 35	56	19.7
Education		
No school	4	1.4
Elementary / middle school	72	25.3
High shcool	171	60
Diploma	28	9.8
Bachelor	10	3.5
Employee		
No	241	84.6
yes	44	15.4

Table 4. Characteristics of perinatal mortality

Characteristics	n	%
Parity		
Primigravida	88	30.9
Multigravida	181	63.5
Grandemultigravida	16	5.6
Gestational age		
Preterm	232	81.4
Aterm	50	17.5
Postterm	3	1.1
Birth weight		
<2000 g	209	73.3
2000 g-<2500 g	33	11.6
2500 g-<4000 g	42	14.7
>4000 g	1	0.4
Mode of delivery		
Vaginal	175	61.4
Abdominal	110	38.6

Table 5. Perinatal deaths based on ANC examination

	2014		**2015**	
	n	%	n	%
Booked Case (ANC ≥3 times)	15	10.6	17	11.8
Non-Booked Case (ANC <3 times)	126	89.4	127	88.2
Total	141	100	144	100

Table 6. Characteristics of perinatal mortality based on cause of death and maternal disease

Characteristics	n	%
Cause of death		
Prematurity	98	34.4
Asphyxia	58	20.4
Sepsis	32	11.2
Congenital abnormalities	46	16.1
Etc	27	9.5
Unknown	24	8.4
Maternal Disease		
Preeclampsia / Eclampsia	153	53.7
Antepartum Bleeding	20	7.0
Complications during childbirth	36	12.6
Heart disease	16	5.6
Etc	60	21.1

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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 infant 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*

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.

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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 infant 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