

Systematic Review Relationship Between Cesarean Section Delivery And Asphyxia Incidence

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ABSTRACT

We reviewed the outcomes for 211 women undergoing a planned en caul (within intact membranes) cesarean section and for 836 control women with conventional lower segment sections, in the period 2001–2010 at a university-affiliated hospital in China, where the former technique has been practiced. Of the intended en caul sections there were 141 successful deliveries (66.8%), and 70 that failed and were converted to conventional lower segment cesarean sections. Maternal blood loss was similar for both operation types, but the rate of asphyxia was significantly lower among preterm infants delivered by the en caul method than in the control cases. Multivariate logistic regression revealed that the volume of amniotic fluid, a low Bishop score and high birth weight were associated with failed en caul deliveries. A retrospective cohort study was conducted in a single tertiary center, between January 1st, 2007, and December 31st, 2017. The study included 62330 singleton pregnancies delivered after 24 0/7 weeks gestation. Multivariable analyzes compared trauma at birth cesarean section, birth hypoxia and birth asphyxia in term and preterm deliveries, stratified by mode of birth, VD versus CS. Main outcome measure was trauma at birth including intracranial laceration and haemorrhage, injuries to scalp, injuries to central and peripheral nervous system, fractures to skeleton, facial and eye injury.

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INTRODUCTION

Sectio Caesarea is a type of surgery with the aim of delivering a fetus through an incision in the front wall of the abdomen or laparotomy and uterine wall or hysterectomy (Putri, Nursalam, & Has, 2012). Indications for Sectio Caesarea include: mother's height ≤ 145 cm, mother's age ≥ 35 years, baby's birth age ≥ 42 weeks, giving birth to a baby with complications of labor and a complete history of Ante Natal Care (ANC) (Sihombing, Saptarini, & Putri, 2017). The incidence of Sectio Caesarea in Indonesia according to Basic Health Research (RISKESDAS) data from 2010-2013 was 9.8% with the highest incidence in DKI Jakarta (19.9%) and the lowest in Southeast Sulawesi province (3.3%) (Sihombing, Saptarini, & Putri, 2017). There are several reasons why mothers choose Sectio Caesarea surgery, namely to reduce pain compared to giving birth normally. Sectio Caesarea surgery usually occurs in women with high economic status, highly educated, living in urban areas, working as private employees, and using health insurance (Sihombing, Saptarini, & Putri, 2017). The incidence of sectio caesarea in Indonesia according to national survey data in 2007 was 921,000 out of 4,039,000 deliveries or around 22.8% of all deliveries (Rasjidi, 2009). In Bondowoso the incidence of sectio caesarea according to survey data from the health office in 2015 was 2410 out of 5754 deliveries or around 41.9% of all deliveries. (Ahlberg et al., 2017)

According to WHO which was conducted in 9 (nine) Asian countries in 2013 and 2014, in Cambodia, China, Nepal, the Philippines, Sri Lanka, Thailand and Vietnam it is known that the percentage of caesarean section deliveries is around 27.3%. this survey examined nearly 108,000 deliveries in 122 hospitals. Sectio caesarea can increase maternal morbidity and mortality, so sectio caesarea is carried out only because of medical indications. (Veronica Magdalena Pinontoan, 2017) The cause of delivery by caesarean section can be due to problems on the part of the mother and

baby. There are two caesarean section decisions. First, the decision to caesarean section which has been previously diagnosed. The causes include, among other things, an imbalance in the size of the baby's head and the mother's pelvis (narrow pelvis, large child, location of the forehead, location of the face, etc.), severe pregnancy poisoning, severe pre-eclampsia or eclampsia,

Asphyxia neonatorum is a condition of newborns who experience difficulty breathing immediately or fail to breathe spontaneously and regularly after birth (Herdman & Kamitsuru, 2015). According to (Price & Wilson, 2006), respiratory failure occurs when the lungs cannot fulfill their primary function in gas exchange, namely oxygenation of arterial blood and removal of carbon dioxide. The main cause of infant and under-five deaths occurs during the neonatal period because during this period the baby makes many physiological adjustments needed for extrauterine life starting from newborn to 28 days of age (Behrman, Kliegman, & Arvin, 2000). According to the National Population and Family Planning Agency, the Central Bureau of Statistics (2013), Infant mortality in the neonatal period reaches 60% and the main cause of neonatal death is neonatal asphyxia. Based on data (World Health Organization (WHO) in Damayanti, 2014), every year 3.6 million babies (3%) out of 120 million newborns experience asphyxia. Based on the results of research conducted by Pangemanan, Wantania, & Wagey (2016) at Prof. Hospital. Dr. RD Kandou Manado obtained 1,273 (41.9%) asphyxia babies from 3,038 births. (Summanen et al., 2017)

According to RISKESDAS in 2018, the number of deliveries by SC method in women aged 10-54 years in Indonesia reached 17.6% of the total number of deliveries. There are also several birth defects/complications in women aged 10-54 years in Indonesia reaching 23.2% with details of the transverse/ breech fetal position of 3.1%, bleeding of 2.4%, seizures of 0.2%, rupture of membranes Early delivery was 5.6%, prolonged labor was 4.3%, cord coil was 2.9%, placenta previa was 0.7%, placenta was left behind was 0.8%, hypertension 16 was 2.7%, and others. -others by 4.6% (Research and Health Development of the Republic of Indonesia Ministry of Health, 2018).

From a preliminary study at the Syarifah Ambami Rato Ebu Regional Hospital in 2013 there were 624 babies born by cesarean section. From sectio caesarea deliveries, there were 39 babies who experienced asphyxia. Meanwhile, from January to March 2017 there were 184 births, of which 130 were births by sectio caesarea and 52 were normal births, while the rest were births by vacuum. Out of 130 births by sectio caesarea, there were eight babies who had respiratory problems, while in 52 normal births there were two babies who had respiratory system problems. When viewed from the above incident rates, asphyxia in newborns is still quite high, where the incidence of asphyxia can be caused by various factors,

METHOD

Systematic Review is a literature review that has the objective of identifying knowledge gaps, determining research agendas, identifying implications for decision making and exploring extensively through the available evidence by mapping out the concepts underlying the research, sources of evidence and the types of evidence available (Tricco et al., 2016). The goal of a systematic review is to map evidence on a topic of discussion based on the selected literature and identify key concepts, theories, sources, and knowledge gaps (Tricco et al., 2018).

The process of this systematic review is carried out using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for systematic Review (PRISMA-ScR) guidelines. PRISMA-ScR is designed to help readers (such as researchers, publishers, commissioners, policy makers, healthcare providers, guideline developers, and patients or consumers) have a better knowledge of related terminology, important concepts, and important elements to report for scoping reviews. The following are 22 assessment steps in writing a systematic review: title, Structured Summary, Rational, Objective, Protocol and Registration, Eligibility Criteria, Information Sourcing, Search, Selection of Sources (Optimal), Data Charting, Data item, Critical Appraisal Of Individual Of

Evidence, Synthesis Of Result, Selection of Sources of Evidence, Characteristics of Sources of Evidence,

Table 1 Framework PICO

P (Population, Patiet, Problem)	I (Intervention, Prognostic factor, Exposure)	C (Comparison or Intervention/if appropriate)	O (Outcomes)
Mother gave birth by cesarean section	Cesarean section delivery	-	asphyxia

Based on the PICO Framework, is it a systematic review question of the relationship between cesarean section deliveries and the incidence of asphyxia?

The initial step taken is to determine the inclusion and exclusion criteria of the framework that has been created with the aim that the data sought will focus on the context sought. Following are the inclusion and exclusion criteria used by researchers in the systematic review:

Table 2 Inclusion and Exclusion Criteria

NO	ASPECT	INCLUSION	EXCLUSION
1	KARAK	a. Original Research b. Articles published in English c. Articles published within the last 10 years (January 1, 2012 – October 30, 2022) d. All study designs	1. <i>reviewed</i> articles, theses, books and theses Predators Journal
2.	Participant	Population : women with cesarean section	vaginal delivery
3	Focus study	a. Articles that discuss cesarean section deliveries with asphyxia events	

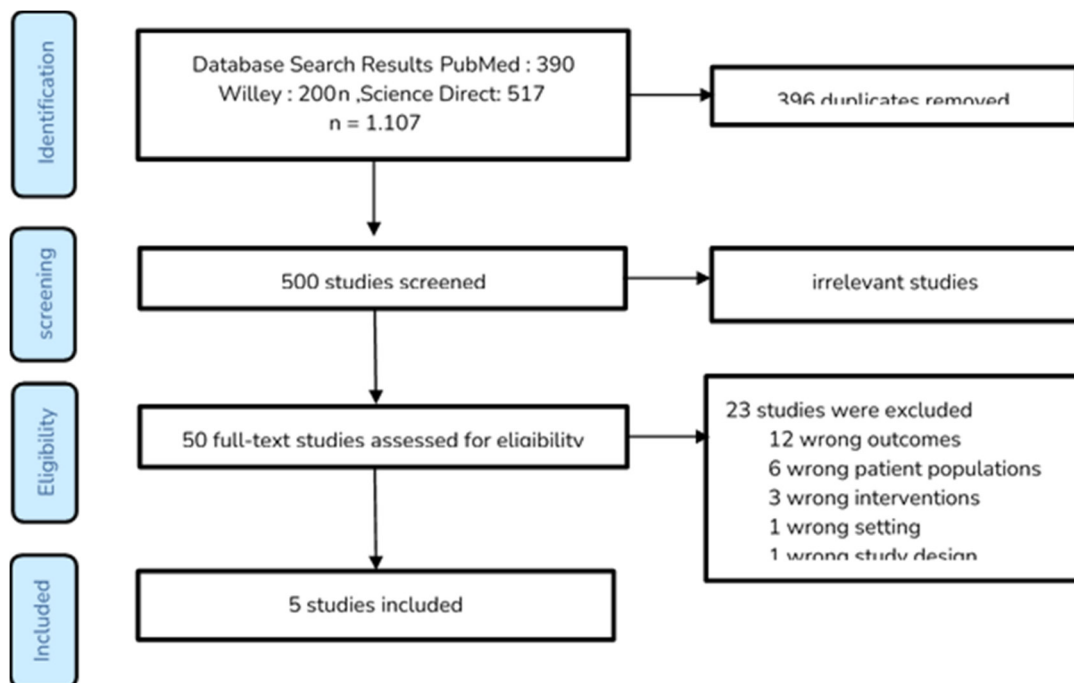


Figure 1 PRISMA Flowchart

Selected publications are included in the imported PRISMA study flowchart for the title and abstract filtering column, while articles that are out of sync are included in the irrelevant study column. The researchers used the mapping findings from the Covidence website. The PRISMA Flowchart design is used because it can help researchers display the results of selecting articles, as a result it makes it easier for readers to understand the flow of selecting articles.

Table 3 JBI Critical Appraisal Checklist For Qualitative Study

Assessment Questions	ARTICLE				
	A1	A2	A3	A4	A5
1. Is there a congruence between the stated philosophical perspective and the research methodology?	3	3	3	3	3
2. Is there a match between the research methodology and the research questions or objectives?	3	3	3	3	3
3. Is there a fit between the research methodology and the methods used to collect data?	3	3	3	3	3
4. Is there a fit between the research methodology and data representation and analysis?	3	3	3	3	3
5. Is there a fit between the research methodology and the interpretation of the results?	3	3	3	3	3
6. Is there a statement that positions the researcher culturally or theoretically?	3	3	3	3	3
7. Is the researcher's influence on research, and vice versa, addressed?	3	2	3	3	3
8. Are participants, and their voices, adequately represented?	3	3	3	3	3
9. Was the study ethical according to current criteria or, for recent research, and was there evidence of ethical approval by the appropriate body?	3	3	3	3	3
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	3	3	3	3	3
TOTAL VALUE (GRADE)	30/A	29/A	30/A	30/A	30/A

Through the JBI Critical Appraisal Checklist For Qualitative Study, it was found that the five articles received Grade A. In article 1 it was scored 30, in article 2 it was scored 29, in article 3 it was scored 30, in article 4 it was scored 30 and in article 5 it was scored 30. In article 2 the assessment of the influence of researchers on research, and vice versa, was handled to obtain point 2 (unclear) because it only highlights some of the problems associated with cesarean delivery with asphyxia

RESULTS AND DISCUSSION

Results

1. Characteristics of Articles Based on Research Design

Based on the inclusion criteria that had been set since the beginning of screening the articles, the researchers used 5 articles, all of which used qualitative studies.

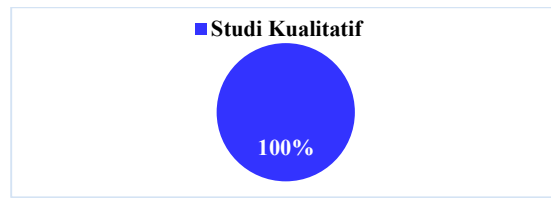


Figure 2 Based on Research Design

2. Characteristics of Articles by Country

Characteristics by country in the 5 articles that have been selected are as follows:

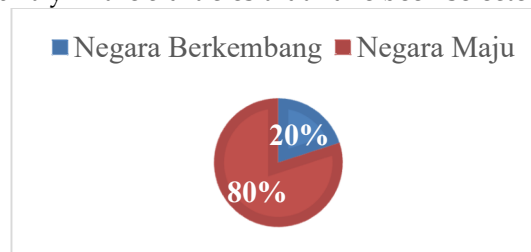


Figure 3 By Country

Characteristics by country in the five articles, namely 7 developed countries and 4 developing countries.

Characteristics of Articles by Year of Publication

Characteristics based on the year of publication of the five articles, namely that 3 articles were published in 2013, 2 articles were published in 2019, and 2 articles were published in 2020.

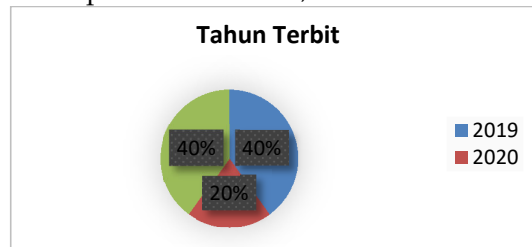


Figure 4 by Year of Publication

3. Characteristics of Articles Based on Grade

Based on the qualitative study, there is a Grade A (Good) Scale with a score of 21-30, Grade B (Fairly Good) with a score of 11-20 and Grade C (Poor) with a score of < 10. The five articles received Grade A with each A1 score (30/30 quality good), A2 (29/30 good quality), A3 (30/30 good quality), A4 (30/30 good quality) and A5 (30/30 good quality).

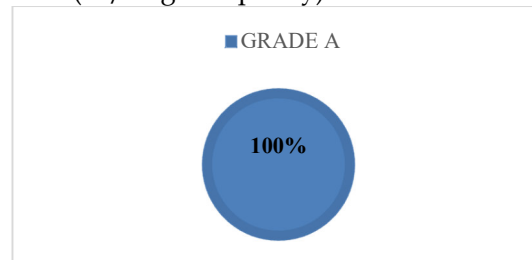


Figure 5 Based on Grade

Discussion

1. The role of health workers

Sectio Caesarea is a type of surgery with the aim of giving birth to a fetus through an incision in the front wall of the abdomen or laparotomy and uterine wall or hysterectomy. , giving birth to babies with complications of labor and a complete history of Ante Natal Care (ANC) (Sihombing, Saptarini, & Putri, 2017). The incidence of Sectio Caesarea in Indonesia according to Basic Health Research (RISKESDAS) data from 2010-2013 was 9.8% with the highest incidence in DKI Jakarta (19.9%) and the lowest in Southeast Sulawesi province (3.3%)(Yang et al., 2019)

The incidence of sectio caesarea in Indonesia according to national survey data in 2007 was 921,000 out of 4,039,000 deliveries or around 22.8% 2 of all deliveries (Rasjidi, 2009). In Bondowoso the incidence of sectio caesarea according to survey data from the health office in 2015 was 2410 out of 5754 deliveries or around 41.9% of all deliveries. At Bhayangkara Hospital itself, the number of sectio caesarea patients was 802 for the period from January to October 2015 which is the hospital with the highest sectio surgery in the Bondowoso area, while only 275 cases of normal delivery. (Bondowoso Health Office, 2015)(Salman et al., 2019)

2. Challenges and suggestions for asphyxia due to cesarean section

Respiratory failure in new babies Anesthesia in sectio caesarea can affect blood flow by changing perfusion pressure or vascular resistance both Fadhillah Fanny | Sectio caesarea as a Cause of Asphyxia Neonatorum Majority | Volume 4 | Number 8 | November 2015 | 61 directly or indirectly which can cause asphyxia events. In addition, the rather large pressures concomitant with chest compressions in vaginal delivery and it is estimated that the displaced lung fluid is equivalent to one-fourth of the functional residual capacity. So, a baby born with a cesarean section contains more fluid and less air in his lungs during the first six hours after birth. In addition, the rather large pressures concomitant with chest compressions in vaginal delivery and it is estimated that the displaced lung fluid is equivalent to one-fourth of the functional residual capacity. So, a baby born with a cesarean section contains more fluid and less air in his lungs during the first six hours after birth. In addition, the rather large pressures concomitant with chest compressions in vaginal delivery and it is estimated that the displaced lung fluid is equivalent to one-fourth of the functional residual capacity. So, a baby born with a cesarean section contains more fluid and less air in his lungs during the first six hours after birth.

The incidence of neonatal asphyxia in developing countries is higher than in developed countries. In developing countries, approximately 4 million newborns suffer from moderate or severe asphyxia, of which 20% die. In Indonesia, the incidence of asphyxia is approximately 40 per 1000 live births, overall 110,000 neonates die each year due to asphyxia.(Kune et al., 2021)

This retrospective study was conducted at Shengjing Hospital, affiliated with China Medical University, in Shenyang. We examined 1047 women who underwent premature cesarean section at <37 weeks to investigate the factors that influence the success of en caul cesarean section. Estimation of gestational age is based on the first day of the last menstrual period and/or a routine ultrasound examination performed no later than 18 weeks' gestation. All cases were pregnancies in single cephalic presentation, and women with premature rupture of membranes, fetal/neonatal congenital malformations, concomitant myomas or uterine scars were excluded. After comprehensive discussion with the woman regarding the known risks, benefits and outcomes of cesarean en caul and with traditional lower segment cesarean section, in full accordance with the guidelines of the ethical review board, women scheduled for the procedure of their choice, and informed consent including registration. in research found. Overall, 211 women chose cesarean en caul; 836 women who opted for conventional lower segment cesarean section were assigned as the control group (excluding failed en caul cesarean sections). Combined spinal-epidural anesthesia was used in all

cases, and all antenatal fetal heart rate recordings were normal. Asphyxia was defined as a five-minute Apgar score <7. We measured the volume of maternal blood loss by suction during surgery. Vaginal blood loss after surgery was also measured. Total maternal blood loss is the sum of these two volumes. All placentas are delivered spontaneously.

Data were processed using the statistical package SPSS for Windows 13.0 (SPSS, Chicago, IL, USA). Data are expressed as mean \pm SD. We use AN

One-way OVA or Kruskal-Wallis H test for comparison of continuous data, while the chi-square test was used for categorical data and logistic regression analysis to estimate confounding factors. Influential asphyxia factors related to en caul caesarean section are possible confounding variables; $p < 0.05$ was considered significant.(Jin et al., 2013)

CONCLUSION

The results of a systematic review of the relationship between the type of cesarean section delivery and the incidence of asphyxia. The incidence of asphyxia in newborns can be caused by various factors, including the factor of delivery by action, namely delivery by cesarean section. This means that newborns with cesarean section deliveries have a higher risk of asphyxia than normal deliveries because it is caused by physiological changes due to the delivery process.

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