

## Relation between cesarean section with neonatal asphyxia incident at haji regional general hospital of east java province

Isnain Nur Rohmah <sup>1</sup>, Euvangelia Dwilda Ferdinandus <sup>1,\*</sup>, Astika Gita Ningrum <sup>1</sup> and Pudji Lestari <sup>2</sup>

<sup>1</sup> Midwifery Study Program, Faculty of Medicine, Airlangga University, Surabaya, East Java, Indonesia.

<sup>2</sup> Department of Public Health, Faculty of Medicine, Airlangga University, Surabaya, Indonesia.

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### Abstract

**Background:** Neonatal mortality rate is one of the health indicators in Indonesia. Neonatal asphyxia is one of the highest causes of death in Indonesia for several years in a row. Risk factors for neonatal asphyxia consist of maternal risk factors and fetal risk factors. One of maternal risk factors in intrapartum period is use of anesthesia during childbirth with cesarean section. This study aims to determine relationship between caesarean section and neonatal asphyxia incident at Haji Regional General Hospital of East Java Province (RSUD Haji Jatim) in 2024.

**Method:** This study is a quantitative study with observational analytics and cross-sectional design. Number of samples are 425 respondents in mothers giving birth at the RSUD Haji Jatim in 2024. Samples were taken using consecutive sampling according to the inclusion and exclusion criteria that had been set. This research instrument use secondary data in the form of medical records and data collection sheets. Data analyzed using chi square method.

**Results:** The results of study showed that there is relationship between cesarean section and incident of neonatal asphyxia with a p value = 0.034 ( $p < 0.05$ ).

**Conclusion:** There is relationship between cesarean section's childbirth with neonatal asphyxia incident. Suggestions for further researchers to examine other risk factor causes neonatal asphyxia using different research designs and sampling techniques.

**Keywords:** Neonatal Complications; Neonatal Mortality; Surgery; Complications Obstetrics; Midwifery Health

### 1. Introduction

Neonatal mortality remains a significant global health issue. According to World Health Organization (WHO) data in 2022, as many as 2.3 million babies died in first 28 days after birth. The main factors causing neonatal mortality include premature birth, complications during delivery such as asphyxia, neonatal infections, and congenital abnormalities. Although death rate from these causes has decreased globally since 2000, pattern of main causes tends to remain same from year to year. (1). In Indonesia number of Neonatal mortality in 2022 and 2023 is 4 and 7 deaths per 1,000 births live, with highest dead reason is asphyxia neonatorum (2,3). In East Java based on East Java's Provincial Health Profile in 2022 and 2023, neonatal mortality 4.55 and 6.4 per 1,000 births life and asphyxia is reason number two for both in 2022 and 2023(4, 5). Surabaya is one of the cities in East Java, with neonatal mortality in 2022 and 2023 is 2.8 and 2.2 deaths per 1,000 births life with neonatal asphyxia as one of the three highest reasons for neonatal death (6,7).

\* Corresponding author: Euvangelia Dwilda Ferdinandus.

Neonatal asphyxia is a condition caused by disturbances in the exchange of oxygen and carbon dioxide that are not immediately treated. This condition causes a decrease in partial pressure of oxygen, an increase in partial pressure of carbon dioxide, and occurrence of acidosis, which can then develop into multiorgan dysfunction. Risk factors for neonatal asphyxia are divided into two, namely maternal factors and fetal factors. One of maternal risk factors in intrapartum period is use of anesthesia or opiates (8). One use of anesthesia in intrapartum period is for cesarean section.

Caesarean delivery (caesarean section) is a procedure for the birth of fetus that is carried out through surgery, namely by making an incision in the abdominal wall (laparotomy) followed by an incision in the uterine wall (hysterotomy). (9). This procedure requires anesthesia to eliminate pain in patient during the procedure (10). Latest report from WHO shows that in 2021, more than 21% of deliveries worldwide were by cesarean section. This figure is expected to increase to around 29% by 2030. (11). Based on Rikesdas data, in Indonesia number of labor with caesarean section experienced significant increase from 17.6% in 2018 to 25.9% in 2023. In East Java, childbirth with caesarean section also increased from 22.4 % in 2018 to 31.2% in 2023 (12, 13). Although caesarean section is intervention surgery that can save life in certain situation, but when done without clear medical indication can cause risk health for mother and also babies, including short term and long-term complications (11). One of complications to baby is occurrence of asphyxia neonatorum (8). Trilus' study (2018) found that mothers giving birth with caesarean section have a chance to give birth to babies with neonatal asphyxia as much as 3,467 times higher compared to Mothers giving birth without caesarean section (14).

RSUD Haji Jatim is one of the hospitals owned by East Java Province with B-education category and is one of references hospital in East Surabaya area. Based on preliminary study by researchers' neonatal asphyxia incident in 2022 amounted to 2 1.4 % and experienced decline in 2023, accounted to 19.4% of total births. At RSUD Haji Jatim, cesarean section deliveries accounted for 55.1% of total births in 2022 and 53.2% in 2023.

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## 2. Materials and methods

### 2.1. Type Study

This research is quantitative research using analytical observational research design. The approach in this study uses cross sectional.

### 2.2. Population

Population in this study were all mothers who gave birth at the RSUD Haji Jatim, from January to December 2024, a total of 722 patients.

### 2.3. Sample

Sample selection in this study was conducted using consecutive sampling. Samples in this study were those that met following criteria

Inclusion criteria: maternal medical record data giving birth the complete one

#### 2.3.1. Exclusion criteria

- Dual diagnosis where one patient has a diagnosed for one or more
  - hypertension in pregnancy with diabetes mellitus in pregnancy
  - hypertension in pregnancy controlled with diabetes mellitus in pregnancy
  - hypertension in pregnancy controlled with gestational diabetes mellitus
  - hypertension in controlled pregnancy with diabetes mellitus in controlled pregnancy
- Incomplete medical record data
- Umbilical cord compression
- Umbilical cord prolapses
- Birth trauma
- Malpresentation (example: breech presentation)
- Fetal growth retardation
- Congenital anomaly
- Intrauterine pneumonia
- Severe meconium aspiration

- Multiple pregnancy
- Labor with induction
- Instrument-assisted delivery

Sample obtained in this study was 425 respondents.

### 2.4. Data collection

Data collection in this study carried out through medical records at RSUD Haji Jatim in 2024.

### 2.5. Data analysis

Scale used in this study is a nominal-ordinal scale, using chi square method to analyze.

## 3. Results and Discussion

From data processing to understand relation between caesarean section with neonatal asphyxia incident, following result obtained

**Table 1** Cross Tabulation Between Caesarean Section with Neonatal Asphyxia Incident at RSUD Haji Jatim

Type Labor	Neonatal Asphyxia						Total		Mark P
	No Neonatal Asphyxia	%	Mild-Moderate Neonatal Asphyxia	%	Severe Neonatal Asphyxia	%	N	%	
Spontaneous	60	14.1	86	20.2	5	1.2	151	35.5	0.034
Caesarean section	144	33.9	125	29.4	5	1.2	274	64.5	

Based on table above, from a total of 425 respondents, majority (33.9%) gave birth by cesarean section with baby not experiencing neonatal asphyxia. Meanwhile, 29.4% of respondents gave birth by cesarean section with baby experiencing mild to moderate neonatal asphyxia.

From statistical tests using chi square obtained p value = 0.034 ( $p < 0.05$ ) which means there is connection between caesarean section and neonatal asphyxia incident at RSUD Haji Jatim. This study in line with result of study by Trilus (2018) which found there are relation between caesarean section and neonatal asphyxia incident (14).

Caesarean section is surgery procedure performed to give birth to baby through incision in mother wall stomach and uterus. This procedure usually chosen when normal vaginal delivery is risky for Mother or baby. This can happen If complications occure during labor process, or when there is certain medical condition that hinder normally labor, such as existence of blockage in birth canal (15).

Caesarean section generally done because of number of indications, including: obstacles labor process (dystocia), signs to fetal disorders (fetal distress), fetus abnormal position (eg. breech), placental disorders, or previous caesarean section conducted (15).

Anesthesia used in caesarean section procedure may influence the mother's blood flow, whether direct or indirectly, through changes in perfusion pressure (blood flow pressure to blood vessels) and blood vessels resistance (vascular). This changes in hemodynamics may impact on uteroplacental perfusion, which is blood flow between mother and fetus through placenta. Uteroplacental perfusion disorders may lead to a reduced oxygen supply and nutrients to fetus, which in turn increase risk of neonatal asphyxia (14).

Given that cesarean section has a number of risks, including impacts on the baby's condition, decision to perform this procedure must be made carefully and based on clear medical indications. Currently, there is an increase in requests for cesarean section, which is often influenced by misinformation circulating on social media. Some common misconceptions include the idea that vaginal delivery is more painful than cesarean section, or that vaginal delivery can

cause loosen of vagina. Such inaccurate information can influence maternal preferences and potentially increase rate of medically unmet cesarean section requirement.

WHO recommends several non-medical steps to reduce caesarean section. as well as aims to ensure that pregnant women receive quality care while still respecting their rights as women. The recommendations among others: provide education for women active in planning the birth process, using service guide based on evidence accompanied with audit and feedback for cesarean section procedure implementation, recommend mother to look and consider second opinion for caesarean section (if allows), collaboration between midwife and doctor specialist midwifery in care, as well as equalize cost between vaginal labor and caesarean section (11).

As for when caesarean section unavoidable to save mother and fetus, then neonate resuscitation team must always ready in personnel and resuscitation tool. Neonatal sphygmomania can occur in the womb, during the birth process, or shortly after the baby is born (16). Proper prevention and treatment of neonatal asphyxia can prevent babies from serious complications, including HIE, pulmonary hemorrhage, neurological disorders, and death (17).

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#### 4. Conclusion

Based on conducted research, conclusion drawn there are relation between caesarean section and neonatal asphyxia in RSUD Haji Jatim in 2024. Suggested for RSUD Haji Jatim to use this research conclusion as evaluation and audit material regarding to neonatal asphyxia in its place to identify pattern or causal factor that can be prevented or corrected to upend service quality.

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#### Compliance with ethical standards

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##### *Disclosure of conflict of interest*

All authors declare no have a conflict of interest anything that has an effect to article this.

##### *Statement of ethical approval*

This research has obtained ethical approval from RSUD Haji Jatim with the approval number No.445/18/Kom.Etik/2024.

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#### References

- [1] WHO. Newborn Mortality. 2024 Mar 14 [cited 2024 Dec 31]; Available from: [who.int/news-room/fact-sheets/detail/newborn-mortality](https://www.who.int/news-room/fact-sheets/detail/newborn-mortality)
- [2] Kemenkes. Profil Kesehatan Indonesia 2022. Jakarta; 2023.
- [3] Kemenkes. Profil Kesehatan Indonesia 2023. Jakarta; 2024 Jun.
- [4] Dinkes Jatim. Profil Kesehatan Provinsi Jawa Timur Tahun 2022. In Surabaya: Dinkes Jatim; 2023.
- [5] Dinkes Jatim. Profil Kesehatan Provinsi Jawa Timur Tahun 2023. In Surabaya: Dinkes Jatim; 2024.
- [6] Dinas Kesehatan Kota Surabaya. Profil Kesehatan Kota Surabaya Tahun 2022. Surabaya; 2023 Sep.
- [7] Dinas Kesehatan Kota Surabaya. Profil Kesehatan Kota Surabaya Tahun 2023. Surabaya; 2024 Aug.
- [8] Kemenkes. Keputusan Menteri Kesehatan Republik Indonesia Nomor HK.01.07/MENKES/214//2019 Tentang Pedoman Nasional Pelayanan Kedokteran Tata Laksana Asfiksia. Jakarta; 2019.
- [9] Cunningham FG, Leveno KJ, Dashe JS, Hoffman BL, Spong CY, Casey BM. Williams Obstetrics 26 th Edition. United States: McGraw Hill; 2022.

- [10] Rohenti IR, Saputri VM. Profile of Anesthetic Drug Use in Caesarean Section Patients in Early Initiation of Breastfeeding (IMD) in One of the Hospitals in Bekasi City. *Pharmacy Journal of Pharmacology, Faculty of Pharmacy, Makassar* [Internet]. 2023 Sep 11; Available from: <http://journal.unhas.ac.id/index.php/mff>
- [11] WHO. Caesarean Section Rates Continue to Rise, Amid Growing Inequalities In Access [Internet]. 2021 [cited 2025 Jun 6]. Available from: [who.int/news/item/16-06-2021-caesarean-section-rates-continue-to-rise-amid-growing-inequalities-in-access](http://who.int/news/item/16-06-2021-caesarean-section-rates-continue-to-rise-amid-growing-inequalities-in-access)
- [12] Kemenkes. Laporan Riskesdas 2018 Nasional. In Jakarta: BALITBANGKES; 2019.
- [13] Kemenkes. Survey Kesehatan Indonesia Tahun 2023. Jakarta; 2023.
- [14] Trilus D, Faculty of W, Health I, Surabaya S. The Relationship between Sectio Caesarea and the Incidence of Asphyxia at the Syarifah Ambami Rato Ebu Regional General Hospital (RSUD) Bangkalan. *Scientific Journal: J-HESTECH* [Internet]. 2018;1(1):9–18. Available from: <http://ejournal.unitomo.ac.id/index.php/jhest>
- [15] Sung S, Mikes BA, Martingano DJ, Heba M. Cesarean Delivery Continuing Education Activity [Internet]. 2024. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK546707/?report=printable>
- [16] Iskandar ATP, Handayani KD, Wilar R, Lusyati S, Yuniati T, Hendrarto TW, et al. Panduan Pelayanan Neonatal UKK Neonatologi PP IDAI. In Jakarta; 2019.
- [17] Lestari DL. Asfiksia Neonatorum. *Scientific Jurnal* [Internet]. 2024 Jan;III. Available from: <http://journal.scientic.id/index.php/sciena/issue/view/17>