

Characteristics of Congenital Fetal Abnormalities in Ulin General Hospital Banjarmasin, South Kalimantan

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Abstract:

Congenital abnormalities are the leading cause of infant mortality and a significant contributor to child and adult morbidity. This study aims to analyze the characteristics and outcomes of fetuses with congenital abnormalities in a tertiary hospital. This study aims to determine the characteristics, influencing factors and a clearer picture of the prevalence and types of congenital abnormalities that occur at Ulin Banjarmasin Regional Hospital. This descriptive-retrospective study used secondary data from medical records collected between January 2022 and December 2024. A total of 85 congenital abnormalities were recorded over three years, with maternal ages ranging from 20 to 35 years, covering 58 (68.24%) cases. The majority of the mothers came from Tabalong Regency, South Kalimantan Province (n=19, 22.35%). Gestational age in the third trimester (>28 weeks) was found in 72 women (81.71%). The majority of respondents were multigravida (n=57, 67.06%). Caesarean section was the most common method of delivery (n=65, 76.47%). There were 51 respondents who had no history of congenital disease in the family (60.00%). The majority of respondents did not consume alcohol and smoke (n=79, 92.94% and n=75, 88.24%). Regarding folic acid consumption, 56 respondents (65.88%) did not consume it. The most common type of congenital disorder found was related to the nervous system with the largest proportion of 21 babies.

Keywords: Congenital Fetal Abnormalities; Morbidity; Mortality

Introduction

Congenital abnormalities are also known as congenital abnormalities, malformations or birth defects. Congenital abnormalities are defined as structural or functional anomalies that occur during intrauterine life and can be identified prenatally, natively, or sometimes only detected postnatally.¹ Congenital abnormalities that occur in the growth of fetal structures starting from conception. These abnormalities are the main cause of miscarriage and perinatal death.² The causes of congenital abnormalities can be genetic or non-genetic. In some cases, women who do not have a family history of congenital abnormalities and are not identified as having risk factors, still give birth to babies with these abnormalities. Therefore, genetic factors, environmental factors, or a combination of both play a role in the occurrence of congenital abnormalities.³

The World Health Organization (WHO) estimates that 240,000 newborns die worldwide in the first 28 days of life each year due to congenital abnormalities. In addition, congenital abnormalities also cause around 170,000 deaths in children aged between 1 month and 5 years. The most common severe congenital abnormalities are heart defects, neural tube defects, and Down syndrome. Nine out of ten children born with serious congenital abnormalities are in low- and middle-income countries.¹ In Indonesia, congenital abnormalities rank fourth as the leading cause of neonatal death with a mortality rate reaching 10.75%.⁴ Research conducted by Amani et al., in 2021 at Dr. Soetomo Hospital found 19 (33%) cases of babies born with one type of congenital abnormality, while the remaining 39 (67%) cases had multiple congenital abnormalities. The three highest proportions of organ systems involved in fetal congenital abnormalities were the abdomen (37.9%), head (34.5%), followed by the thorax and musculoskeletal (20.7%).⁵

Congenital abnormalities contribute to perinatal mortality and long-term health problems that affect communities and health

systems. Worldwide, an estimated 7.9 million children (6% of global births) are born with a birth defect or serious congenital abnormality each year. This causes high morbidity and mortality.⁵

Research on the characteristics of congenital abnormalities in fetuses at Ulin Banjarmasin Hospital in 2022-2024 has never been reported. This study aims to determine the characteristics, influencing factors, and a clearer picture of the prevalence and types of congenital abnormalities that occur at Ulin Banjarmasin Hospital.

Based on this, researchers are interested in conducting research on the characteristics of congenital abnormalities in fetuses at Ulin Banjarmasin Regional Hospital in 2022-2024.

Research Method

This study is a retrospective descriptive study, using secondary data obtained from patient medical records at Ulin Regional General Hospital from January 2022-December 2024. The subjects of this study were infants and fetuses diagnosed with congenital abnormalities recorded in the medical records of Ulin Regional General Hospital (RSUD) in the period January 2022 to December 2024.

The target population in this study were all babies born and fetuses diagnosed with congenital abnormalities recorded at Ulin Hospital in the period January 2022 to December 2024. This accessible population is limited to the number of babies and fetuses who have complete data in the medical records and can be analyzed in this study, and who meet the inclusion and exclusion criteria. The inclusion criteria in this study were babies born at Ulin Hospital in the period 2022-2024, fetuses diagnosed with congenital abnormalities detected through prenatal or postnatal examinations, complete data recorded in the hospital medical records (including diagnosis, maternal age, baby gender, address, education, gestational age,

parity, termination method, family history of congenital abnormalities, alcohol consumption, folic acid consumption, smoking and type of abnormality). The exclusion criteria in this study were patients who were not diagnosed with congenital abnormalities, incomplete or inaccessible data in the hospital medical records.

The independent variables in this assessment are maternal factors (maternal age, address, education, parity, gestational age, method of termination of pregnancy, history of congenital abnormalities in the family, smoking habits, alcohol consumption and drug consumption). The dependent variables in this assessment are the types of congenital abnormalities.

The collected data will be analyzed using descriptive statistics to describe the characteristics of congenital abnormalities in infants and fetuses. The results of the analysis will be presented in the form of a table.

This study was conducted with permission from the hospital ethics committee (health research ethics committee) and the hospital where the data was taken (RSUD Ulin). All data used will be kept confidential and will only be used for research purposes.

Results

Results From the Period January 2022 – December 2024, 85 Respondents were obtained at Ulin Banjarmasin Regional Hospital.

Table 1 Congenital Disorder Incidents at Ulin Regional Hospital 2022-2024

Year	N=85	Percentage (%)
2022	29	34.12%
2023	36	42.35%
2024	20	23.53%

Table 1 shows data on congenital abnormality incidents recorded at Ulin Regional Hospital during the period 2022 to

2024, with a total of 85 cases observed. Based on the table, in 2022 there were 29 (34.12%) cases of congenital abnormalities. In 2023, the number of cases increased to 36 (42.35%). Meanwhile, in 2024, the number of cases decreased to 20 (23.53%) of the total congenital abnormality incidents at Ulin General Hospital.

From this data, it can be seen that 2023 recorded the highest number of cases, while 2024 experienced a decrease in the incidence of congenital abnormalities compared to the previous two years. Fluctuations in the number of cases between years may be influenced by various factors, such as changes in risk factors, health policies, or recording methods applied in hospitals during the period.

Table 2 Some Characteristics of Mothers with Congenital Abnormalities in Fetuses

Variable	N=85	Percentage (%)
Age		
< 20 years old	7	8.24
20-35 years old	58	68.24
>35 years old	20	23.24
Education		
SD	24	28.24
SMP	18	21.18
SMA	33	38.82
Diploma	4	4.71
III/IV		
S1	5	5.88
Gestational Age		
1 st Trimester (<12 weeks)	0	0.00
2 nd Trimester (13-28 weeks)	13	15.29
3 rd Trimester (>28 weeks)	72	84.71
Parity		
Primigravida	28	32.94
Multigravida	57	67.06

Of the total 85 respondents, the majority were in the age range of 20-35 years (68.24%), with a smaller proportion under 20 years old (8.24%) and over 35 years old (23.24%). In terms of education, the majority of respondents had a high school education level (38.82%), followed by elementary school (28.24%) and junior high school (21.18%). Respondents with Diploma III/IV, S1, and S2/S3 education each had a smaller proportion, namely 4.71%, 5.88%, and 1.18%. Based on gestational age, the majority were in the third trimester (>28 weeks) at 84.71%, followed by the second trimester (13-28 weeks) at 15.29%, while there were no respondents with pregnancies in the first trimester (<12 weeks). Most respondents were multigravida (67.06%), while the rest were primigravida (32.94%).

Table 3 Area of Origin of Mother with Congenital Abnormality Fetus

Variable	N=85	Percentage (%)
Address		
Balangan	8	9.41
Banjar	2	2.35
Barito Kuala	5	5.88
Hulu Sungai Selatan	5	5.88
Hulu Sungai Tengah	1	1.17
Hulu Sungai Utara	4	4.70
Kotabaru	14	16.47
Tabalong	19	22.35
Tanah Bumbu	9	10.5
Tanah Laut	2	2.35
Tapin	5	5.88
Banjarbaru	3	3.52
Banjarmasin	8	9.41

Based on the addresses in South Kalimantan Province, the majority of respondents with congenital fetuses came from Tabalong Regency as much as 22.35%, followed by Kotabaru Regency with 16.47%. Tanah Bumbu Regency also showed a significant contribution, namely 10.5%. Meanwhile, Banjarmasin and Balangan Regencies each recorded 9.41% of the total cases. Other areas, such as Hulu Sungai

Selatan and Barito Kuala, each contributed 5.88%, while Tanah Laut was also recorded with the same percentage, namely 5.88%. Banjarbaru Regency contributed 3.52%, followed by Tapin with 2.35%. While Hulu Sungai Tengah had the smallest contribution, namely 1.17%. This distribution shows that most mothers with congenital fetuses come from several main districts in South Kalimantan Province, with the highest concentrations in Tabalong and Kotabaru.

Table 4 Types of Congenital Disorders

Variable	N=85	Percentage (%)
Nervous System	21	24.70
Eye, Ear, Face	9	10.58
Cardiovascular System	18	21.17
Respiratory System	8	9.41
Musculoskeletal System	3	3.53
Gastrointestinal System	14	16.47
Urinary System	7	8.24
Chromosomal Abnormalities	5	5.88

Distribution based on the affected systems showed that the Nervous system was the most frequently affected with a percentage of 24.70% (21 respondents). The cardiovascular system with a percentage of 21.17% (18 respondents). The gastrointestinal system had a percentage of 16.47% (14 respondents). Other affected systems included the eye, ear, and face systems with 10.58% (9 respondents), and the respiratory system with a percentage of 9.41% (8 respondents), and the urinary system with a percentage of 8.24% (7 respondents). Chromosomal abnormalities and the musculoskeletal system were recorded in smaller proportions, at 5.88% (5 respondents) and 3.53% (3 respondents), respectively.

Discussion

The results of this study indicate that the majority of mothers who gave birth to babies with congenital abnormalities were in the age range of 20-35 years, with the highest proportion in this age group reaching 68.24%. This finding is in line with previous studies

which stated that the optimal maternal age for pregnancy is between 20 and 35 years, because the risk of congenital abnormalities tends to be lower in this age group compared to younger or older mothers.¹⁵ However, maternal age outside this range, especially under 20 years and over 35 years, also has a higher risk of experiencing congenital abnormalities in babies. This is in line with the findings that mothers who are pregnant at too young or too old ages have a higher risk of chromosomal abnormalities and other pregnancy complications.⁶ This is related to the incomplete maturity of the mother's reproductive organs in mothers under the age of 20 years and a decrease in maternal organ function in mothers over the age of 35 years.¹⁹ Pregnant patients at a very young age under 20 years or very old age over 35 years do have a risk of discordance and babies with congenital abnormalities, especially chromosomal abnormalities such as Down syndrome.^{11,20}

In terms of education, the majority of respondents had a high school education (38.82%), followed by elementary school (28.24%) and junior high school (21.18%). Only a small portion of respondents had higher education (Diploma, S1, S2/S3). The low level of education in pregnant women is often associated with low knowledge and awareness of the importance of pregnancy check-ups and proper nutritional intake, which can contribute to the incidence of congenital abnormalities.¹³ Education for pregnant women about reproductive health and healthy pregnancy is very important to prevent congenital abnormalities, especially among mothers with low levels of education.

Geographic distribution patterns show that the majority of mothers come from Tabalong Regency (22.35%) and Kotabaru Regency (16.47%) in South Kalimantan. Geographic factors, such as access to health facilities and the quality of medical services, can affect the prevalence of congenital

abnormalities. South Kalimantan is one of the provinces with coal mining results, showing that there are 49 coal mining companies spread across 13 regencies/cities. The location of the largest coal deposits in South Kalimantan is one of them in Tabalong Regency. (Balai Lingkungan Hidup Provinsi Kalimantan Selatan, 2017). Research by Lee KS et al. (2021) Congenital anomalies are associated with environmental risk factors based on maternal exposure to environmental exposure (air pollution, toxic chemicals), parents who smoke, maternal history (infectious diseases during pregnancy, pregestational and gestational diabetes mellitus, and gestational diabetes mellitus), maternal obesity, maternal drug intake, pregnancy through artificial reproductive technology, and socio-economic factors.²²

That most pregnancies end in cesarean section (76.47%) which is higher compared to vaginal delivery (23.53%). This may be due to medical indications, such as abnormal fetal position or complications in the mother or fetus. Previous studies have also shown that cesarean delivery is more often performed in mothers with high-risk pregnancies, including those with fetuses with congenital abnormalities.² Delivery by caesarean section aims to reduce maternal and fetal mortality rates, as well as high birth rates and limited obstetric health resources in developing countries in Asia.²⁰

Most respondents (92.94%) did not consume alcohol, and 88.24% did not smoke. This shows that awareness of the dangers of alcohol and cigarettes during pregnancy is quite high among pregnant women in this study. However, even so, there are still a small number of mothers who are exposed to alcohol and cigarettes, which can increase the risk of congenital abnormalities in babies.²¹ Alcohol use and smoking during pregnancy can cause fetal development disorders, such as fetal alcohol syndrome (FAS) and

abnormalities in the central nervous and cardiovascular systems.¹³

In addition, findings on folic acid consumption showed that only 34.12% of respondents consumed it, while the rest (65.88%) did not consume it. Folic acid is very important during pregnancy, especially in the first trimester, to prevent neural tube defects in the fetus, such as spina bifida and encephalocele.¹⁵ Folic acid deficiency is one of the main risk factors that can affect fetal development and increase the likelihood of congenital abnormalities in the nervous system.¹⁷

In this study, the most common type of congenital abnormality found was in the central nervous system (24.70%), followed by abnormalities in the cardiovascular system (21.17%), gastrointestinal (16.47%), and others. Abnormalities in the central nervous system, including microcephaly, hydrocephalus, and other brain malformations, can be influenced by genetic factors, infections during pregnancy (such as CMV, rubella), exposure to harmful substances, and maternal malnutrition during pregnancy, including folic acid.^{6,10} Handling this disorder requires fast and appropriate medical intervention, such as surgery or other medical therapy that can help improve the baby's quality of life.²¹

Cardiovascular system abnormalities are also quite common, with a prevalence of 21.17%. Congenital abnormalities of the cardiovascular system can include congenital heart disease, such as aortic stenosis, cardiac septal defects, and transposition of the great arteries. Risk factors that contribute to these abnormalities include maternal age, family history, and exposure to alcohol and smoking.¹⁷

In addition, abnormalities in the gastrointestinal system were found in 16.47% of respondents, with types of abnormalities such as esophageal atresia, gastroschisis, and Hirschsprung's disease. Congenital

gastrointestinal abnormalities generally require surgery immediately after birth to ensure the baby's survival and normal digestive function.¹⁶

In Indonesia, the results of the Riset Kesehatan Dasar (RISKESDAS) show that congenital abnormalities are one of the main causes of infant mortality. In infants aged 0-6 days, around 1.4% of deaths are caused by congenital abnormalities, while at the age of 7-28 days, the mortality rate increases to 18.1%. Based on the Global Report on Birth Defects by the March of Dimes Birth Defects Foundation in 2006, the prevalence of congenital abnormalities in infants in Indonesia was recorded at 59.3 per 1,000 live births. This figure shows that Indonesia has a relatively high prevalence of congenital abnormalities compared to other Southeast Asian countries.^{7,8} The data obtained by South Kalimantan is not yet fully available in national publications. Based on national trends, it is estimated that around 3-4% of babies born in South Kalimantan have congenital abnormalities. Data from the Dinas Kesehatan Kota Banjarmasin in 2023 showed that neonatal complications due to congenital abnormalities were 0.64%, up from 2022 which was only 0.55%.⁹

Conclusions

This study aims to analyze the characteristics and outcomes of fetuses with congenital abnormalities treated in advanced hospitals. Based on data obtained from medical records between January 2022 and December 2024, it was found that congenital abnormalities in fetuses occurred more often in mothers aged 20-35 years, with the majority coming from Tabalong Regency, South Kalimantan Province. Factors such as maternal age, parity, and gestational age are important factors that influence the incidence of congenital abnormalities in fetuses. The congenital abnormalities found were mostly related to the nervous system, followed by the

cardiovascular and gastrointestinal systems. Although most mothers did not consume alcohol or smoke, low folate consumption can be an important risk factor. Most of the congenital abnormalities found can be grouped as single-system abnormalities, but some cases showed multiple-system abnormalities that require more attention.

It is recommended that pregnant women pay more attention to folic acid consumption from the beginning of pregnancy to prevent congenital abnormalities, considering that many pregnant women do not consume folic acid supplements. In addition, more intensive education and counseling programs are needed to increase awareness of pregnant women regarding the importance of routine health checks, folic acid consumption, and other risk factors that can affect fetal health.

Further research on the early detection of congenital abnormalities and genetic screening needs to be conducted more widely, especially for high-risk mothers, such as older mothers or those with a family history of congenital abnormalities. Hospitals and other health facilities need to improve the quality of antenatal care by involving competent medical personnel and equipping facilities for better screening and diagnosis of congenital abnormalities, to ensure appropriate treatment from an early age. Further research on the relationship between genetic and environmental factors on the incidence of congenital abnormalities, as well as their impact on fetal care and prognosis, is expected to provide deeper insights.

Acknowledgements

As the author, I would like to express my deepest gratitude for the guidance provided in the preparation of this journal and the research process, especially to the Department of Obstetrics and Gynecology, Lambung Mangkurat University, Banjarmasin, South Kalimantan.

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