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RESEARCH ARTICLE

The Characteristic of Congenital Fetal Anomalies at Sanglah Birth Defect Integrated Center (SIDIC), Sanglah General Hospital, Bali Indonesia

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Abstract

Introduction. Congenital anomalies are among the cause of neonatal morbidity and mortality. The aim of this study was to measure the occurrence of congenital fetal anomalies and explored the distribution of specific anomaly at SIDIC (Sanglah Birth Defect Integrated Center), Sanglah General Hospital Bali, Indonesia. Method. The study was a descriptive study of congenital anomalies who were screened at Maternal-Fetal Medicine Division outpatient clinic and who were delivered at Sanglah General Hospital Bali, Indonesia during the period January 2017-December 2018. Result. During two years study period, there were 109 pregnant women who gave birth to 118 babies with congenital anomalies. The system most involved were Gastrointestinal System 21.2% and Central Nervous System 21.2%. The majority of mother (70.6%) was at 20-35 years old. Regarding the gestational age, the majority accounting for 38.5% were at 28 - 34 weeks. Conclusion. In this descriptive study, the incidence of congenital anomalies most involving gastrointestinal system and Central Nervous system. Advanced in the knowledge of congenital anomalies could be important for better prevention. The preventive strategies such as preconception counselling, focused antenatal care, and care to optimized women's health should be implemented.

Keywords: *Congenital anomalies, SIDIC, Fetal anomalies.*

Introduction

Congenital anomalies or birth defects consist of a group of conditions, including physical, biochemical abnormalities during pregnancy and labor which may be related to malformations, disruption or deformation, mental weakness and death [1].The cause could be divided into genetic or non-genetic factors.

The risk factors for congenital anomalies are maternal age over 35 years, history of inherited congenital anomalies, malnutrition during pregnancy, obesity, diabetes mellitus, exposure to teratogenous substances during pregnancy, TORCH infection (Toxoplasma, Others, Rubella, Cytomegalovirus, Herpes Simplex Virus), alcohol consumption, smoking, preeclampsia and multiple gestations as a result of assisted reproductive techniques [1, 2, 3]. The neonatal mortality rate due to congenital anomalies in the world is estimated at around 7% of all neonatal deaths [4]. In Southeast Asia, the numbers of neonatal deaths due to congenital anomalies are about 5-25%. The World Health Organization estimates that the prevalence of congenital anomalies was 64.2/1.000 live births in developing countries and the incidence of congenital anomalies in Indonesia was 15 /1000 live births [4]. Meanwhile, local data at Sanglah General Hospital Denpasar during 1994 to 2005 period was around 2.6/100 births [1, 5].

Detection of congenital anomalies during antenatal period comprise around 47.2% of all anomalies, it comprised about 6.2% major congenital anomalies and 41% were minor congenital anomalies. Postnatal detection of congenital anomalies account for the rest 52.7%, with 10.7% major congenital anomalies and 42% minor congenital anomalies [5].

Based on the previous data, majority of the babies with congenital anomalies (86.81%) were a single anomaly, and the rest (13.29%) had multiple anomalies. Based on organ involvement, 36.81% were craniofacial anomalies, 26.38% were gastrointestinal anomalies, 4.58% were heart anomalies and the rest were anomalies in other organs [4].

Based on the above background, this study aimed to determine the incidence and characteristic of congenital fetal anomalies in the SIDIC program at Sanglah General Hospital Bali, Indonesia, for two years period from January, 1st 2017 until December, 31st 2018. It was hoped that this study would be able to become a reference or basis for conducting further research regarding the characteristics of congenital fetal anomalies.

Methods

The study was descriptive study with retrospective approach conducted at the Maternal-fetal Medicine Division outpatient clinic and Obstetrics Emergency Unit of the Department Obstetrics and Gynecology at Sanglah General Hospital Bali, Indonesia during two years period from January 1st, 2017 to December 31st, 2018. Diagnosis of congenital fetal anomalies based on clinical examination and investigation by ultrasound, echocardiography, haematological and chromosomal analysis. Detailed maternal and antenatal history congenital fetal including maternal age, paternal age, parity, gestational age, bad obstetric history and medical history were reviewed retrospectively.

Results

During the two years of the study, there were 118 congenital fetal anomalies from 109 mothers. The types of congenital fetal anomalies in SIDIC program are presented in Table 1.

Table 1: Distribution of the Fetal Congenital Anomalies in SIDIC Program

Type	Frequency	Percentage (%)
Anencephaly	6	5.08
Hydrancephaly	2	1.69
Microcephaly	2	1.69
Hydrocephalus	3	2.54
Ventriculomegaly	5	4.24
Hygroma Colli	3	2.54
Dandy-Walker	5	4.24
Spina Bifida	1	0.85
Labiopalatoschizis	6	5.08
Cutis dismorphic	1	0.85
Esophageal Atresia	5	4.24
Duodenal Atresia	5	4.24
Hernia diaphragmatica	4	3.39
Omphalocele	4	339
Gastroschizis	6	5.08
Hiscprung Disease	1	085
Vein-Gallen Aneurysm	1	0.85
Fetal Cardiac anomaly	13	11.02
Hydronephrosis	6	5.08
Polycystic kidney disease	2	1.69
Hydrops-fetalis	12	10.17
Thanatoporic dysplasia	1	0.85
Polidactili	2	1.69
CTEV	4	3.39
Multiple congenital anomalies	18	15.25
Total	118	100

Based on organ system, musculoskeletal anomalies were 11.01%, central nervous system anomalies were 21.20%, gastrointestinal system anomalies were 21.20%, genitourinary system anomalies were 8.50%, cardiovascular system anomalies were 9.30%, hydrops fetalis were 10.17% and multiple congenital anomalies were 15.25%

In terms of mother's age, the data showed that 3 cases with congenital anomalies (2.5%) were found at the mother age < 20 years old, and the remaining 77 cases (70.6%) were from mother aged 20-35 years old and the rest 29 cases (26.6%) were from mother aged > 35 years old. The distribution of gestational age at the time of fetal congenital anomalies detection obtained in the SIDIC program is shown in Table 2 below.

Table 2: Distribution of Fetal Congenital Anomalies Based on Gestational Age

Gestational Age	Frequency	Percentage (%)
14 – 23 weeks 6 days	14	12.8
24- 27weeks 6 days	18	16.5
28 -33weeks 6 days	42	38.5
≥ 34 weeks	35	32.2
Total	109	100

Discussion

Prevalence of congenital anomalies varies from various racial, socio-cultural, and ethnic. Recognizing the a etiology is important in order to focus the efforts to reduce risk or prevent the occurrence of congenital anomalies [6].If compared with other studies, as an example Wills study about the spectrum and distribution of congenital anomalies in a tertiary teaching hospital in India, there were 151 cases of congenital fetal anomalies. This showed that congenital anomalies that occur in developing countries have a prevalence of 18.9/ 1000 live births [7].

In our study, the data we obtained showed that the majority of mother age (70.6%) at 20-35 years old. Data collected by Wills, women aged less than 20 years was 2.7%, women aged 21 to 30 years was 69.8% and women aged 31 to 40 years was 26.2%, while women over the age of 40 years were 1.3% [6]. From the data, we could conclude that the distribution of maternal age was similar. Additionally, from the other study, congenital anomalies were more common in multigravida than primigravida [7, 8].

The type of congenital fetal anomalies in SIDIC program compared with the Hanaoka study on ICBDSR surveillance was also more or less similar although some anomalies were higher in this study. Few comparisons could be drawn such as central nervous system anomalies in the SIDIC program compared to ICBDSR were anencephaly (5.08% vs 2,1%), Hydranchepaly (1.69% vs 1.0%), microcephaly (1.69% vs 0.5%), hydrocephalus (2.54% vs 1.0%), spina bifida (1.53% vs 1,5%). The cleft palate (5.08% vs 13.0%), anomalies in the gastrointestinal system including esophageal atresia (4.24% vs 1.0%), Duodenal atresia (4.24% vs 3.6%) [4].

If omphalocele and gastroschisis in SIDIC compared with Allman's study as ICBDSR study had zero incidences of both anomalies, is also showed the similar result as the prevalence of omphalocele (3.39% vs 1.6%) and gastroschisis (5.08% vs 5.2%) [4, 9].Congenital heart anomalies in the SIDIC program obtained fetal cardiac anomaly was 11.02% while in the ICBDSR heart defects was 6.7%. The polycystic kidney disease disorder in the SIDIC program was 1.69% while in the ICBDSR was 1.0%. Multiple congenital abnormalities in the SIDIC program was 15.25% while in Allman's study multisystem disorder was 2.6% and those not classified as 19.2% [7, 9].

The mechanism and screening of the fetal during the antenatal period and newborn at birth could explain this similarity in occurrence the congenital anomalies. This study has some limitations because cases were classified based on data information from medical records, there is a possibility that some needed information was unavailable while at the time of medical records reviewed. Some information was not noted in the medical record such as a teratogenic exposure, and some etiologic cause of birth defect would be missed and cannot be explained.

The small number of congenital anomalies cases and loss of follow up. Finally, we hope that this study will become a reference or basis for conducting further research regarding the characteristics of congenital fetal anomalies and give consideration to health services to improve investigate the common pathway of congenital anomalies.

Conclusion

In this descriptive study, the obtained data of the incidence of congenital anomalies most involving gastrointestinal system and Central Nervous system. Advanced in the knowledge of congenital anomalies could be important for better prevention interventions and as a result, the improvement of the outcome. The preventive strategies could be done to prevent birth defects, such as preconception counselling, focused antenatal

care, care to optimize pregnant women's health including screening and treating predisposing disease, folic acid supplementation, and genetic screening. The preventive strategy by fetal screening during antenatal care is required for early detection and management. All of this effort needs to conduct in harmony as it is the only way to reduce the incidence of congenital anomalies.

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Author Contribution

All authors have contributed equally to all process in this research, including preparation, data gathering and analysis, drafting and approval for publication of this manuscript.

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