

Prevalence of Congenital Anomalies on Routine Ultrasound Examination of Second and Third Trimester of Pregnancy in Cikalong Wetan Hospital

Ridwan Abdullah Putra

Department of Obstetrics and Gynaecology, Cikalongwetan General Hospital,
Bandung Barat, Jawa Barat

Korespondensi: Ridwan Abdullah Putra, email: putraridwanabdullah@gmail.com

Abstrak

Objective: This study aims to determine the prevalence and characteristics of congenital anomalies and maternal demographic of second and third trimester pregnancy as a basis for the planning and management of congenital anomalies in the future pregnancy.

Method: This is a descriptive-retrospective study conducted at Cikalongwetan General Hospital by collecting data obtained from the obstetrics and gynecology outpatient and inpatient register book from January 1st through December 31st 2018.

Results: Ultrasound examination was performed on 2572 patients at second and third trimester of pregnancy. 37 cases (1.44%) of congenital anomalies was found. Single congenital anomalies was found in 29 cases (78.38%), while 8 cases were found with multiple anomalies (21.62%). Based on organ anomaly, defects in the central nervous system was the most common with 15 cases (40.54%), followed by gastrointestinal system in 8 cases (21.62%). The gestational age related to CA was found most common in the third trimester with 21 cases (56.76%), while deceased fetus (IUID) was found in 11 cases (29.73%).

Conclusion: This study is expected to foster early awareness regarding regular antenatal care and the importance of ultrasound examination so can help in primary prevention of disability and reducing perinatal mortality and morbidity.

Key words: Prenatal, Congenital anomalies, Ultrasonography

Prevalensi Kelainan Kongenital Janin saat Ultrasonografi Rutin pada Trimster Dua dan Tiga Kehamilan di RSUD Cikalongwetan

Abstrak

Tujuan: Menentukan prevalensi kejadian, jenis kelainan kongenital dan data demografi ibu saat trimester dua dan tiga selama periode penelitian sebagai dasar dan bahan pertimbangan dalam perencanaan dan manajemen bayi dengan kelainan bawaan selanjutnya.

Metode: Penelitian retrospektif dengan cara mengumpulkan data yang diperoleh dari buku register kunjungan poli dan rawat inap Kebidanan dan Penyakit Kandungan RSUD Cikalongwetan selama periode 1 Januari – 31 Desember 2018.

Hasil: Pada penelitian ini telah dilakukan pemeriksaan ultrasonografi sebanyak 2572 ibu hamil trimester dua dan tiga, ditemukan kelainan kongenital 37 kasus (1,44%). Kelainan kongenital tunggal 29 kasus (78,38%), 8 kasus kelainan ganda (21,62%). Berdasarkan kelainan organ, cacat pada sistem saraf pusat menempati urutan pertama 15 kasus (40,54%) diikuti oleh kelainan pada sistem pencernaan 8 kasus (21,62%) dan sistem saluran kemih 4 kasus (16,22%) dan lainnya 12 kasus (32,43%). Usia kehamilan dari kelainan kongenital yang paling sering ditemukan pada trimester ketiga 21 kasus (56,76%) dengan janin yang telah meninggal (IUID) sebanyak 11 kasus (29,73%).

Kesimpulan: Penelitian ini diharapkan dapat menumbuhkan kesadaran sejak dini mengenai perawatan antenatal yang teratur dan pentingnya pemeriksaan ultrasonografi sehingga dapat membantu dalam pencegahan primer kecacatan serta mengurangi angka kematian dan morbiditas perinatal.

Kata kunci: Prenatal, Kelainan kongenital, Ultrasonografi

Introduction

Congenital anomalies, also known as congenital disorders or congenital malformations. Congenital anomalies is defined as structural or functional anomalies that occur during intrauterine and can be identified at prenatal, at birth or later in life. These defects result from defect in embryogenesis or intrinsic abnormalities in the development process. World Health Organization reported about 3 million fetuses and infants are born and 276.000 babies die within 4 weeks of birth every year from congenital anomalies. Worldwide surveys have shown that birth prevalence of congenital anomalies varies greatly from country to country. It is reported 3% in the United States, 2.5% in India, and 2% to 3% in the United Kingdom. The prevalence is low in Japan (1.07%) and high in Taiwan (4.3%). These variations may be explained by social, racial, ecological, and economical influences.¹⁻⁵

The most common congenital disorders are congenital heart defects, neural tube defects and Down Syndrome.⁶⁻⁹

There are various investigating tools which are available for diagnosis of congenital abnormalities. One of which is ultrasound, which has become an invaluable tool for detection of fetal abnormalities in antenatal period. Recent research found that structural abnormalities such as skull, brain, spine, abdominal wall, limbs, stomach and bladder can be detected at 11-14 weeks scan in 22.3% of the cases; therefore, a second trimester anomaly scan was suggested in a routine antenatal care to increase the prenatal detection of the fetal defect.¹⁰ In certain studies, the sensitivity of detection of fetal anomalies, before the 24th week of gestation, was 93% for the central nervous system, 45.2% for the circulatory system, 85.2% for the digestive system, 85.7% for the urinary system, 84.6% for the musculoskeletal system

and 95.2% for other anomalies. Therefore, it is suggested that ultrasonography between the 20th and 22nd weeks of pregnancy can detect the majority of congenital anomalies.¹⁰⁻¹¹

The overall detection time varies from early to late pregnancy depending upon the gestational age of the foetus in the first antenatal check up. The accuracy of detection of fetal abnormalities depends on various factors such as experience of the operator, quality of equipment, and type of malformation.

In countries with poor social support system, bringing up a child with mental or physical handicap is a major burden for the parents and the family. In cases where primary prevention are not possible, prenatal diagnosis by ultrasound provides the next best alternative. When a major structural defect is identified, termination of pregnancy can be considered. This study aims to evaluate the antenatal prevalence of major congenital anomalies and malformation patterns in Cikalongwetan General Hospital populations.

Method

This is a retrospective study conducted in Department of Obstetrics and Gynaecology Cikalongwetan General Hospital, Bandung Barat, West Java.

Pregnant women in the second and third trimester pregnancy coming to the hospital from January 1st to December 31st 2018 were the subject in this study. Ultrasound examination was conducted by foetomaternal consultant using USG Logiq P5 Voluson. Congenital anomalies that was found during examination are clearly recorded and documented on the patient's medical record.

Data on register book and medical records were recorded on the data collection sheet which included: date of visit, type or congenital disorder that has been diagnosed by ultrasound examination, mother's age and parity, gestational age, and fetal life status.

Result

During the study period, ultrasound examination was performed on 2572 patients at second and third trimester of pregnancy. 37 cases (1.44%) of congenital anomalies was found. Single congenital anomalies was found in 29 cases (78.38%), while 8 cases were found with multiple congenital anomalies (21.62%).

Based on organ system anomalies, defects in the central nervous system was the most common with 15 cases (40.54%), followed by digestive system anomaly in 8 cases (21.62%), urinary tract system anomaly in 4 cases (16.22%), musculoskeletal anomaly in 2 cases (5.41%) which consisted of skeletal dysplasia and clubfoot (CTEV), and 10 cases of other anomalies (27.03%) such as hydrops fetalis in 5 cases, cystic hygroma in 3 cases, and down syndrome in 2 cases.

From all central nervous system anomaly, anencephaly is the most common (found in

6 cases), followed by hydrocephalus in 4 cases, spina bifida in 3 cases, microcephaly in 1 case, and agenesis of corpus callosum in 1 case. Most common gastrointestinal anomalies are gastroschisis in 3 cases, omphalocele in 3 cases, diaphragmatic hernia in 2 cases. And for urinary tract anomaly, 2 cases of polycystic anomaly and pelvic-uterine junction obstruction in 2 cases.

Based on mother's age, the number of fetuses diagnosed with congenital anomalies was highest in the age group of > 35 years which counted for 20 cases (54.05%), age 20-35 years for 12 cases (32.43%) and lowest at age < 20 years in 5 cases (13.51%).

Based on mother's parity, infant with the highest congenital anomalies in multiparas (≥ 3) was found in 21 cases (56.77%). The gestational age related to congenital anomalies was found most common in the third trimester with 21 cases (56.76%), while deceased fetus (IUFD) was found in 11 cases (29.73%).

Table 1 Characteristic congenital anomalies positive group (n=37)

Variabels	Category	Numbers	Percentage
Age in years	<20	5	13.51
	20-35	12	32.43
	>35	20	54.05
Parity	0	5	13.51
	1	3	8.10
	2	8	21.62
	≥ 3	21	56.77
	Gestational age	2 nd trimester	16
	3 rd trimester	21	56.76

Table 2 Result of USG of anomalies positive group (n=37)

Variabels	Numbers	Percentage
Life foetus at time	26	70.27
Intra uterine fetal death (IUFD)	11	29.73
Multiple pregnancy	2	5.41
Multiple anomaly of foetus	3	8.11

Tabel 3 Congenital anomalies involving different system (n=37)

Category	Anomaly	Number	Percentage
Central nervous system	Anencephalus	6	16.22
	Hydrocephalus	4	10.81
	Spine bifida	3	8.11
	Microcephaly	1	2.70
	Agenesis corpus callosum	1	2.70
Gastrointestinal	Gastroschizis	3	8.11
	Omphalocele	3	8.11
	Herni diaphragmatica	2	5.41
Genitourinary	Polycystic kidney	2	5.41
	Pelviuteric junction obstructi	2	5.41
Musculoskeletal	Dysplacya sceletal	1	2.70
	Clubfoot (CTEV)	1	2.70
Others	Hydropsfetalis	5	13.51
	Cystic hygroma	3	8.11
	Down syndrom	2	5.41

Discussion

Advanced diagnostic technology, especially USG, has made it possible to detect increased number of birth defects in infants antenatally and during the neonatal period. In present study, attempts had been made to find out the antenatal prevalence of anomalies in our hospital who attended for USG in second and third trimester.

The antenatal prevalence of congenital malformation in the present study was 1.44%, which is comparable with the observations of Nakling et al 1.47%, and Souka et al 1.21%. Higher prevalence was observed some other studies like Sallout et al 2.96%, Alia et al 2.97%, Dolk et al 2.39% and Yanuarman et al 4.1% in Hasan Sadikin General Hospital in Bandung. On the other hand, Taboo et al and Alakananda et al showed lower prevalence than the present study. This variation may be due to different geographical area, social factor, racial difference, observer variation and equipment quality.¹¹⁻¹⁹

As true prevalence of congenital anomalies depends upon several factors and therefore two studies are never strictly

comparable. Though elderly age group and higher parity are considered as risk factors for congenital anomaly, in our study the incidence was observed higher in primigravida and younger age group. This may be due to earlier age of marriage in our scanning population.

True prevalence of congenital anomalies depends upon several factors and therefore two studies are never strictly comparable. Yanuarman et al. stated that the majority of women having congenital anomalies in the foetus were primigravida and aged between 20-35 years old. Our study suggested multipara and age of >35 years old as the risk factor of congenital anomalies.¹²⁻¹⁹

In this study, central nervous system anomaly is the highest (40.54%) followed by gastrointestinal system anomaly (21.62%). This finding is similar to Yanuarman et al., Agarwal et al., and Parveen et al. There was no congenital heart anomaly found in this study.

Conclusion

Creating awareness regarding regular antenatal care and the importance of ultrasound

examination can help in primary prevention of disability and reducing perinatal mortality and morbidity. In this study, the researcher didn't analyze the relationship between antenatal care awareness and USG examination as the primary prevention of disability and reduction of perinatal mortality.

References

1. WHO. Congenital anomalies, fact sheet. Geneva:WHO. 2015.
2. Stephen TC, Daniel WS. Using ultrasound to recognize fetal anomalies: Part 1. *Contemporary OB/GYN*. 2017;64(07):1-4.
3. Fanni RE, Artur B. Congenital fetal anomalies and the role of prenatal ultrasound. *Intech Open*. 2017;10.5772(71907):1-20.
4. Dario P, Paolo V. *Ultrasound of congenital fetal anomalies: differential diagnosis and prognosis indicator*. CRC Press Publisher. 2014;10.1201(2):b13793.
5. Jhuma B, Kaushik D, Shyamal D, Biswajit G, Poushali S, et al. Prenatal ultrasound screening to diagnose congenital anomalies among one thousand unselected women and their pregnancy outcome. *Jurnal of Evolution of Medical and Dental Scences*. 2013;2(13):1966-1971
6. Teresa M. Prenatal diagnosis for congenital malformations and genetic disorders. *Medscape*. 2017.
7. Kaur N, Pamnani S, Kaur B. Role of ultrasound in diagnosis of fetal congenital abdominal anomalies: One year prospective study. *International Journal of Medical Research*. 2017;5(07):649-656.
8. L Sreekala MS. Prevalence of congenital anomalies in routine antenatal ultrasound. *BMH Medical Journal*. 2016;3(4):85-93.
9. Sallout B, Obedat N, Shakeel F, Mansoor A, Walker M, et al. Prevalence of major congenital anomalies at King Fahad Medical Saudi Arabia: a tertiary care centre-based study. *Ann Saudi Med*. 2015;35(5):343-51
10. Osanyin GE, Odesaye AK, Okojie OO, Akinajo OR, Okusanya BO. Fetal congenital anomaly in tertiary hospital in Lagos, South West Nigeria: a review of presentation and its outcome. *West Afr J Med*. 2019;36(1):25-28.
11. Nayab A, Irshad A, Amir HM, Nazia P. Congenital anomalies: prevalence of congenital abnormalities 2nd trimester of pregnancy in Madina Teaching Hospital, Faisalabad on gray scale ultrasound. *JUMDC*. 2010;1(1):23- 28.
12. Nagla HMK, Rehab H, Samia A. Prevalence and Frequency of congenital anomalies of the central nervous system among Saudian population KSA-Najran. *MR Journals*. 2017;5(12):654-659.
13. Anila A, Yasmin W. Frequency of fetal congenital anomalies and associated risk factor observed in pregnan women in a Public Sector Hospital of Karachi. *ASH & KMDC*. 2016;21(3):139-146.
14. Shirvastava SR, Shirvastava PS, Pamasamy J. Congenital anomalies: public health interventions to ensure its and expansion care to the patients. *Cukurova Med J*. 2015;40:135-7.
15. Shreejana S, Yogita D, Pooja J, Binod P. Congenital in antenatal ultrasound scan at a tertiary care teaching hospital. *JPAHS*. 2018;5(1):26-30.
16. Shah K, Pensi CA. Study of incidence of congenital anomalies in newborn. *Gujarat Medical Journal*. 2013;68(2):97-9.
17. Yanuarman , Aziz MA , Mose JC. Congenital anomalies: Case Review January 1st 2011 - December 31st 2013 Period in The Sakura Fetomaternal Diagnosis Unit Dr. Hasan Sadikin General Hospital , Bandung Fetomaternal Division of the Department of Obstetrics and Gynecology Faculty of Medicine, Padjadjaran University / Dr. Hasan

- Sadikin General Hospital , Bandung Indonesia.2015.
18. Taboo ZAA. Prevalence and risk factors for congenital anomalies in Mosul city. The Iraqi Postgraduate Medical Journal. 2012;11(40):458-70.
 19. Alakananda, Choudhury SS, Neiting C. A study on prevalence of congenital anomalies of foetuses among pregnant women in a tertiary care hospital and its association with socio-demographic factors. The New Indian Journal of OBGYN. 2015;2(1):46-50.