The International Innovations Journal of Applied Science (IIJAS) Vol. 2, No.1, 15-03-2025
المجلد الثاني العدد الاول 2025-3-15 (IIJAS) مجلة ابتكارات الدولية للعلوم التطبيقية
https://doi.org/10.61856/1emwm102

SCIENTIFIC EVENTS GATE

The International Innovations Journal of Applied Science

Journal homepage: https://iijas.eventsgate.org/iijas

ISSN: 3009-1853 (Online)

IIJAS

The Rate and Variety Of Birth Defects In Newborns At Babylon Teaching Hospital For Maternity And Children For The Period (2022-2023)

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ARTICLE INFO

Article history:
Received 5 Dec. 2024
Revised 1 Jan 2025,
Accepted 9 Jan 2025,
Available online 15 Mar. 2025

Keywords:
Birth defects
Anomalies
Malformations
Frequency
Congenital

ABSTRACT

Birth defects refer to structural changes that appear at birth and can affect any part or parts of the body, such as the heart, brain, or feet and represent an important health issue globally , impacting several millions newborns each year. Of these, 3.3 million die when they reaching the five age, while 3.2 million experience somatic or mind disabilities. Understanding the various causes of these anomalies is crucial to enable effective healthcare management and intervention. The objective was to assess the frequency and variety of birth defects in newborns in Hilla City from 2022 to 2023.A descriptive design to examine and describe the variables and their interrelationships related to birth defects in newborns in Hilla City from 2022 to 2023.. In 2022 and 2023 years , a total of 5,034 newborns were delivered among them, 60 were detected with birth defects, resulting in a rate of 1.19%. The predominant malformations involved in 2022 were Multiple Congenital malformations (56.52%) and Down's syndrome (13.04%) while in 2023 the predominant malformation involved Multiple Congenital malformations (59.46%) followed by Congenital heart disease (18.92%). An association was found between maternal age and birth defects, with a p-value of <0.05. Additionally, newborn gender was also related to the occurrence of birth defects, with a p-value of <0.05.The research suggests that advancing maternal age is linked to an elevated risk of congenital abnormalities. Consistent prenatal care and diagnostic testing are advised to support prevention, early detection, and, when needed, planned termination.

1. Introduction

Congenital defects are a major cause of perinatal and neonatal deaths globally, affecting both industrialized and low-income countries. These malformations arise from a range of factors, with approximately 40% of cases being idiopathic. There is evidence suggesting a higher prevalence in populations with consanguineous marriages(Sallout etal.,2008; Shetty etal.,2023).

The development of a fetus from a fertilized egg involves a series of intricate processes, any of which can potentially lead to defects or variations. For instance, the formation of the upper extremities occurs between the fourth and sixth weeks of pregnancy, when the embryo is about an inch long and resembles a miniature baby. Estimates suggest that 1 in 20 infants may present with some form of imperfection (Mashuda etal.,2014; Silesh etal.,2021).

Some congenital abnormalities are inherited in a manner similar to traits such as hair and eye color. These genetic traits may skip generations and manifest only when both parents pass on a recessive gene to their child. Additionally, certain genetic conditions may arise de novo, meaning the baby is the first to exhibit the condition, though it may be passed

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https://doi.org/10.61856/1emwm102

on to future generations (AbouEl-Ella etal.,2018; Kurdi etal.,2019).

Furthermore, specific medications, such as chemotherapy agents and thalidomide, are known to cause birth defects. Understanding the causes of congenital abnormalities is crucial for improving prevention and treatment strategies(Togoo etal.,2012; Eltyeb etal.,2023).

Recreational drugs, tobacco, and alcohol are known to impact fetal development, but there is no specific evidence linking them to upper extremity abnormalities(Alshehri,2005). One notable condition associated with congenital deformities is congenital constriction bands, where threads of the amniotic membrane detach and wrap around the fingers or hands of the baby (Fida etal.,2007). The exact cause of these bands remains unknown. Many congenital abnormalities arise without a clear explanation, potentially resulting from disruptions in the complex developmental processes of the fetus. Researchers and geneticists are actively working to identify specific diagnoses and determine whether these conditions are hereditary(Sallout etal.,2015).

2. Methodology

A descriptive study design was employed to examine the variables and their relationships in this research. This design was selected to fulfill the objective of assessing **the frequency and variety** of birth defects in newborns in Hilla City during the period from 2022 to 2023.

The study was conducted with the necessary permissions from the relevant administrative bodies and ethical committees to ensure compliance with ethical standards and regulations.

The study was carried out at the Babylon Teaching Hospital for Maternity and Children in Hilla City.

The data was collected from the hospital's statistics department for the years 2022 and 2023 where study utilized a random sampling method, involving 5,034 newborns. Out of these, 60 were diagnosed with congenital malformations. Data was statistically analyzed using the (SPSS) version 25 and Microsoft Excel (2016). Various statistical measures were applied to evaluate frequency , percentage and p value. All continuous quantitative variables and overall knowledge scores were tested for normality distribution and adhered to the normal statistical distribution.

3. Results and discussion

The 5,034 newborns were delivered in 2022 and 2023. Of these, 60 were diagnosed with birth defects, resulting in rate of 1.19%.

The predominant malformation involved was Multiple Congenital malformations (56.52%) and Down's syndrome (13.04%) [Table 1].

Table 1 Distribution of congenital malformations in 2022.

Malformations	Frequency	Percentage
Down's syndrome	3	13.04
Reproductive system malformations	1	4.35
Ichthyosis	2	8.7
Multiple Congenital malformations	13	56.52
Musculo-skeletal system malformations	1	4.35
Congenital heart disease	1	4.35
Imperforate anus	1	4.35
Abdominal malformation	1	4.35
Total	23	100.0

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The predominant malformation involved was Multiple Congenital malformations (59.46%) followed by Congenital heart disease (18.92%) [Table 2].

Table 2 Distribution of congenital malformations in 2023.

Malformations	Frequency	Percentage
Lungs malformation	1	2.7
Multiple Congenital malformations	22	59.46
Congenital heart disease	7	18.92
Reproductive system malformations	4	10.81
Hydrocephalus	1	2.7
Skin and joints malformation	2	5.41
Total	37	100.0

There is a meaningful association between mothers' age and birth defects. Also, Newborn gender in relation with birth defects , p value was <0.0.5[Table 3]..

Table 3 Association among birth defects and mothers' age and gender of newborn for both years 2022 and 2023. Total number(60).

Variable	Group	Frequency (%)	Congenital anomalies P value
Maternal age	≤ 20	32(53.33)	0.027
	20-30	18(30.0)	
	31-40	8(13.33)	
	≥40	2(3.33)	
Newborn gender	Male	34(56.67)	0.041
	Female	26(43.33)	
Years	2022	23(38.33)	0.073
	2023	37(61.67)	

The occurrence and distribution of congenital abnormalities can change considerably over time and across various regions, influenced by a complex combination of genetic, environmental, socio-cultural, racial, and ethnic factors. In low-income countries, where progress has been made in addressing infections and nutritional deficiencies, birth defects have become a leading cause of perinatal death (Taksande et al.,2010).

In the current study, the occurrence of birth defects in newborns was found to be 1.19%. This figure is similar to the results of a study in India, which registered occurrence rates of 2.72% and 1.9%. However, a study conducted in Erbil City, Iraq, observed a higher prevalence of 3.5%. The differences in prevalence rates could be because of variations in study methods, population characteristics, or environmental influences (Othman ,2013).

An interesting feature of this study is the notable correlation between mothers' age and the incidence of birth defects. This result is consistent with similar researchs conducted in Morocco by (Elghanmi et al.,2020) and study of (Green et al.,2010) which also found a significant link between mother age and birth defects. In contrast, a study in India by (Sachdeva et al.2014) did not observe this association, possibly due to regional and contextual differences. Study conducted by (Reefhuis and Honein,2004) found that younger age of mother associated with several birth defects.Regarding gender distribution, this study observed a variation in the incidence of congenital anomalies between male and female newborns. Consistent with a study conducted in Iran by (Abdi-Rad et al., 2008)which found congenital anomalies to be more prevalent in female infants, our results also indicate a higher prevalence in females. However, a study in Kuwait by (Madi et al.2005) found a predominance of congenital anomalies in male babies. This discrepancy highlights the need for further investigation into the biological and environmental factors contributing to these gender differences.

In assessing the factors contributing to congenital anomalies, variables such as gender distribution, preterm births, birth weight, family history, and birth order were taken into account. Both hereditary and ecological influences are critical in conditions like congenital heart diseases and neural tube defects (McIntosh et al.,1995,Mashuda etal.,2014).The effect of consanguineous marriages on certain anomalies highlights the

requirement for genetic counseling and understanding initiatives for couples considering such marriages.

Furthermore, factors like family history, calcium intake, and pregnancy-related hypertension are important in relation to congenital anomalies. Health issues during pregnancy, use of medications, contraceptive methods, and supplementation with iron and folic acid also play a role in the risk of certain congenital defects. Recognizing these factors is vital for healthcare contributors to manage pregnancies properly and reduce the risks linked to congenital anomalies.

4. Conclusions

Our study revealed that whenever mother age decrease, the risk of congenital defects increases. Also, gender was in significant relation with congenital anomalies happening . Despite advancements in molecular diagnostics for congenital abnormalities, the initial diagnosis and decision to refer patients for further molecular analysis and costly genetic tests often depend on clinical and radiological evaluations. Given the little of other studies, additional research in this area is recommended.

References

Abdi-Rad, I.; Khoshkalam, M.; Farrokh-Islamlou, H.R.(2008). The Prevalence at Birth of OvertCongenital Anomalies in Urmia Northwestern Iran. Arch. Iran. Med. , 11, 148–151. PMID: 18298290

AbouEl-Ella, S.S.; Tawfik, M.A.; El-Fotoh, W.M.M.A.; Elbadawi, M.A.(2018). Study of congenital malformations in infants and children in Menoufia governorate, Egypt. Egypt. J. Med. Hum.Genet. 19,359–365. https://doi.org/10.1016/j.ejmhg.2018.04.002

Alshehri, M.A.(2005). The Pattern of Major Congenital Anomalies in Southwestern Saudi Arabia. Bahrain Med. Bull.27, 1–6. PMCID: PMC3649744 PMID: 23667734

Birch MR, Grayson N, Sullivan EA. AIHW Cat. No. PER 23. Birth Anomalies Series No. 1. Sydney: AIHW National Perinatal Statistics Unit; 2004. Recommendations for development of a new Australian birth anomalies system: A review of the congenital malformations and birth defects data collection. 70:572–579, 2004. PMCID: PMC6299654 PMID: 30563491

Elghanmi, A.; Razine, R.; Jou, M.; Berrada, R.(2020). Congenital malformations among newborns in Morocco: A retrospective study. Pediatr. Rep. , 12, 7405 doi: 10.4081/pr.2020.7405

Eltyeb, E.E.; Halawi, M.H.A.; Tashari, T.B.M.; Alharbi, K.; Alsayari, O.S.; Albarrak, D.A.; Eltayeb, R.A.; Al-Makramani, A.A.A.; Medani, I.E.M. (2023).Prevalence and Pattern of Birth Defects in Saudi Arabia: A Systematic Review of Observational Studies. Pediatr. Rep. 15, 431–441. https://doi.org/10.3390/pediatric15030040

Fida, N.M.; Al-Aama, J.; Nichols, W. A.(2007). prospective study of congenital malformations among live-born neonates at University Hospital in Western Saudi. Saudi Med. J. 28, 476–484. PMID: 17768462

Kurdi, A.M.; Majeed-Saidan, M.A.; Al Rakaf, M.S.; AlHashem, A.M.; Botto, L.D.; Baaqeel, H.S.; Ammari, A.N.(2019).Congenital anomalies, and associated risk factors in a Saudi population: A cohort study from pregnancy to age 2 years. BMJ Open . 9, e026351. DOI: 10.1136/bmjopen-2018-026351

Madi, S.A.; Al-Naggar, R.L.; Al-Awadi, S.A.; Bastaki, L.A.(2005). Profile of major congenital malformations in neonates in the Al-Jahra region of Kuwait. East. Mediter. Health J. , 11, 700–706. https://doi.org/10.1159/000026088

Mashuda, F.; Zuechner, A.; Chalya, P.L.; Kidenya, B.R.; Manyama,M.(2014). Pattern and factors associated with congenital anomalies among young infants admitted at Bugando Medical Center, Mwanza, Tanzania. BMC Res. Notes , 7, 195. https://doi.org/10.1186/1756-0500-7-195

McIntosh, Given C.1; Olshan, Andrew F.2, 3; Baird, Patricia A.4.(1995). PATERNAL AGE AND THE RISK OF BIRTH DEFECTS IN OFFSPRING. Epidemiology 6(3):p 282-288 https://doi.org/10.1097/00001648-199505000-00016

Othman GO.(2013). The prevalence and types of congenital anomalies in newborns in erbil. Medical Journal of Islamic World Academy of Sciences. Jan;109(555):1-4. https://doi.org/10.12816/0000209

Reefhuis,J.and Honein M.A.(2004). Maternal age and non-chromosomal birth defects, Atlanta—1968–2000: Teenager or thirty-something, who is at risk?† Published 2004 Wiley-Liss,Inc. https://doi.org/10.1002/bdra.20065

https://doi.org/10.61856/1emwm102

Ridgely Fisk Green, Owen Devine, Krista S. Crider, Richard S. Olney, Natalie Archer, Andrew F. Olshan, Stuart K. Shapira (2010),Association of Paternal Age and Risk for Major Congenital Anomalies From the National Birth Defects Prevention Study, 1997 to 2004,Annals of Epidemiology,Volume 20, Issue 3, ,Pages 241-249,https://doi.org/10.1016/j.annepidem.2009.10.009

Sachdeva, S.; Nanda, S.; Bhalla, K.; Sachdeva, R. (2014).Gross congenital malformation at birth in a government hospital. Indian J. Public Health , 58,54–56.https://doi.org/10.4103/0019-557x.128170

Sallout, B.; Obedat, N.; Shakeel, F.; Mansoor, A.; Walker, M.; Al-Badr, A. (2015).Prevalence of major congenital anomalies at King Fahad Medical City in Saudi Arabia: A tertiary care center-based study. Ann. Saudi Med. , 35, 343–351.https://doi.org/10.5144/025604947.2015.343

Sallout, B.I.; Al-Hoshan, M.S.; Attyyaa, R.A.; Al Suleimat, A.A.(2008). Antenatal diagnosis, prevalence, and outcome of major congenital anomalies in Saudi Arabia: A hospital-based study. Ann. Saudi Med. 28, 272–276. https://doi.org/10.4103/0256-4947.51703

Shetty, N.; Mantri, S.; Agarwal, S.; Potdukhe, A.; Wanjari, M.B.; Taksande, A.B.; Yelne, S.(2023). Unraveling the Challenges: A Critical Review of Congenital Malformations in Low Socioeconomic Strata of Developing Countries. Cureus 15,e41800.https://doi.org/10.7759/cureus.41800

Silesh, M.; Lemma, T.; Fenta, B.; Biyazin, T.(2021). Prevalence and Trends of Congenital Anomalies Among Neonates at Jimma Medical Center, Jimma, Ethiopia: A Three-Year Retrospective Study. Pediatric Health Med. Ther. 12,61–67. https://doi.org/10.2147/phmt.s293285

Taksande A, Vilhekar K, Chaturvedi P, Jain M.(2010). Congenital malformations at birth in Central India: A rural medical college hospital based data. Indian J Hum Genet. 16:159–63. https://doi.org/10.4103/0971-6866.73412

Togoo, R.A.; Yaseen, S.M.; Meer, Z.; AlMohy, A.; AlQahtani, J. A. (2012).Preliminary Report on Cleft Deformities of the Face and Associated Anomalies in Abha, Saudi Arabia. J. Orofac. Res. , 2, 187–191. https://doi.org/10.5005/jp-journals-10026-1039