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Prevalence and Frequency of Congenital Anomalies in Al - Rifai Teaching Hospital

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Abstract: Background: Congenital anomalies define as abnormalities of body structure that originated before birth, about 3% of all children are born with a serious structural defect that interferes with normal body function and can lead to lifelong handicap or even early death. There is a variation in the frequency of congenital anomalies in different populations.

Aim of study: To identify the most common types of congenital abnormalities and their percentage among newborn infants in neonatal care unit in Al - Rifai teaching Hospital, And To identify the probable predisposing factors that result in these congenital abnormalities

Patient and Method: This was a retrospective study performed in Al - Rifai teaching Hospital at the neonatal care unit (which serves both urban and rural area) in a period from the 1st of January 2010 to the 31th of December 2014. The total number of deliveries was 50917 live birth. From all these deliveries, there were 670 with gross congenital anomalies where evaluated by pediatrician in the neonatal intensive care unit..

Result: 670 cases had have a gross congenital anomalies. The average of Prevalence during five years was 1.3% with high incidence during 2019.this study showing male predominance and the most affected system was CNS 255(33.6) fallowed by SYNDROMES 245(32.3),GIT 80(10.5) RENAL 67(8.8) MUSKELOSKELETAL 60(7.9)and lastly RESPIRETORY 50(6.6).the affected maternal age was between 20-30 years. Body weight consanguinity and maternal risk factor like chronic disease drugs exposure and radiation had important role.

Conclusion: Neurological anomalies, especially neural tube defects, are the most common type of congenital abnormalities in newborn infants with CNS relatively higher male than female infants. Fallowed by syndromes especially (down syndrome).

Keywords: prevalence, congenital anomalies, congenital abnormalities.

Introduction

Congenital anomalies (CAs), sometimes referred to as birth defects, are structural and functional abnormalities of any organ system that may be identified during pregnancy, at the time of

delivery, or subsequently in life (1,2). Congenital malformations or birth defects are common among all races, cultures, and socioeconomic strata. Birth defects can be isolated abnormalities or part of a syndrome and continue to be an important cause of neonatal and infant morbidity. The World Health Organization (WHO) projected that in 2008, around 260,000 infants born with congenital anomalies died within the first 28 days of life (3).

Approximately one in every 33 infants is born with a congenital anomaly globally (4,5). Annually, it is estimated that 3–7% of children are born with congenital anomalies (6). The prevalence of CAs differs among countries and even within regions of the same country. Deformations arise from extrinsic mechanical compression of one or more regions of the body during fetal development. The most common causes of deformations are amniotic bands, twinning, uterine malformations and masses. (7-9). A study conducted in the United States and the United Kingdom revealed that the prevalence of CAs was 6% and 3.3%, respectively (10). The frequency of CAs differs among communities engaged in identical occupations and sharing comparable lifestyles and environments. Furthermore, the issues exert a considerable socio-economic and psychological influence on individuals, families, and communities (6,7).

The precise etiologies of numerous cancers remain unidentified, while the causes of some cancers are acknowledged to be associated with multifactorial origins and hereditary factors.(11-14), and environmental factors (15-17). Similarly, consanguineous unions and chromosomal anomalies, including as neurological disorders, have been identified as contributors to congenital anomalies(18,19). Nevertheless, such unions are infrequent among Ethiopian women owing to societal and cultural conventions.

A familial history of birth defects correlates with an elevated risk of conceiving another child with congenital anomalies, with a recurrence rate of 2 to 5% for neural tube defects and Down syndrome, respectively (20). Fouzia et al. (2013) also showed a higher prevalence of neural tube abnormalities in families with low socioeconomic and educational status (21).

The birth of a child with an abnormality is a traumatic event for both parents and the community. In Ethiopia, numerous children succumb to and become crippled from congenital anomalies. Moreover, when mothers bear children with congenital anomalies, communities often ascribe this to sin or divine wrath; hence, parents are prone to experiencing anxiety and guilt. Nevertheless, the issue is not receiving adequate attention from policymakers and scholars.

Methodology

This was a retrospective study performed in Al - Rifai teaching Hospital at the neonatal care unit (which serves both urban and rural area) in a period from the 1st of January 2010 to the 31th of December 2014. The total number of deliveries was 50917 live birth. From all these deliveries, there were 670 neonates have an obvious congenital anomalies admitted to the Neonatal Intensive Care Unit and evaluated by pediatricians. Information list for each newborn, taking the details from the mother which includes: age, gravidity, parity, , residence, consanguinity, , occupation of parents. history of her present pregnancy if any complications like chronic illness, rash, fever, any medication, folic acid supplementation and X ray exposure, previous abortion or fetal death or previous fetal anomalies and the type of the anomalies according to the system affected . gender and body weight of the baby.

In this study, only the gross anomalies (which was diagnosed at birth by a clinical examination only) were included, congenital malformation collected in syndrome were evaluated in separate group .

Statistical analysis was done using SPSS version 20 software program, Chi square test was used and a p-value < 0.05 was considered significant.

Result

Table 1 shows the distribution of congenital anomalies according to the frequency and sex

Years	Sex	Total live birth	Malformed neonate	%
2010	Male	7832	136	1.73 %
	Female	3403	89	2.6 %
	Total	11235	225	2 %
2011	Male	5341	52	0.9%
	Female	4616	46	0.9 %
	Total	9957	98	0.9 %
2012	Male	4017	128	3.1%
	Female	6853	65	0.9%
	Total	10870	193	1.7%
2013	Male	7458	50	0.6%
	Female	3784	28	0.7%
	Total	11242	78	0.6%
2014	Male	2801	42	1.4%
	Female	4812	34	0.7%
	Total	7613	76	0.9%

The study included 50917 neonates delivered in obstetrical ward of Al - Rifai teaching Hospital during the 5 years period, of them 670 cases had have a gross congenital anomaly. The average of Prevalence during five years was 1.3%.Our study shows a predominant of male in all years as shown in table (1).The highest percentage of congenital anomalies was revealed in 2010 (2%)

Table 2 shows the distribution of cases according to the system affected in each year:

System.affacted 2010	No.	Male no.& %	Female no& %	% From total
CNS.	97	63(64,9%)	34(35,05%)	43.1%
GIT.	23	13(56,5%)	10(43,4%)	10.2%
Mus.Sk.	15	4(26,6%)	11(73,3%)	6.6%
Ren.	14	14(100%	0(0%)	6.2%
Resp.	11	6(54,4%)	5(45,4%)	4.8%
Synd.	65	36(55,3%)	29(44,6%)	28.8%
Total	225	136(60%)	89(40%)	100%
System.affacted 2011	**No.**	**Male no.& %**	**Female no& %**	**% From total**
CNS.	39	19(48,7%)	20(51,28%)	39.7%
GIT.	20	11(55%)	9(45%)	20.4%
Mus.Sk.	6	2(33%)	4(66,6%)	6.1%
Renal	8	8(100%)	0(100%)	8.1%
Resp.	4	3(75%)	1(25%)	4.08%
Synd.	21	9(42,8%)	12(57,1)	21.4%
Total	98	52(53%)	46(47%)	100%
System.affacted 2012	**No.**	**Male no.& %**	**Female no& %**	**% From total**
CNS.	83	52(62,6%)	31(37,3%)	43%
GIT.	16	13(81,5%)	3((18,75%)	8.2%
Mus.Sk.	21	12(57,1%)	9(42,8%)	10.8%
Ren.	20	20(100%)	0(100%)	10.3%
Resp.	19	12(63,1%)	7(36,8%)	9.8%

Synd.	34	19(55,8%)	15(44,1%)	17.6%
Total	193	128(66%)	65(34%)	100%
System.affacted 2013	**No.**	**Male no.& %**	**Female no& %**	**% From total**
CNS.	17	11(64,7%)	6(35,2%)	21.7%
GIT.	12	5(41,6%)	7(58,3%)	15.3%
Mus.Ske.	6	4(66,6%)	2(33,3%)	7.6%
Ren.	11	11(100%)	0(0%)	14.1%
Resp.	6	1(16,6%)	5(83,3%)	7.6%
Synd.	26	18(69,2)	8(30,7%)	33.3%
Total	78	50(64%)	28(36%)	100%
System.affacted 2014	**No.**	**Male no.& %**	**Female no& %**	**% From total**
CNS.	19	7(36,8%)	12((63,1%)	25%
GIT.	9	3(33,3%)	6(66,6%)	11.8%
Mus.Ske.	12	4(33,3%)	8(66,6%)	15.7%
Ren.	14	9(64,2)	5(35,7%)	18.4%
Resp.	10	10(100)	0(0%)	13.1%
Synd.	22	9(40,9)	13((59,09)	28.9%
Total	76	42(55%)	34(45%)	100%

Table two show the distribution of syndromes among the five years its signifies the Down syndrome was highly frequency among the five years

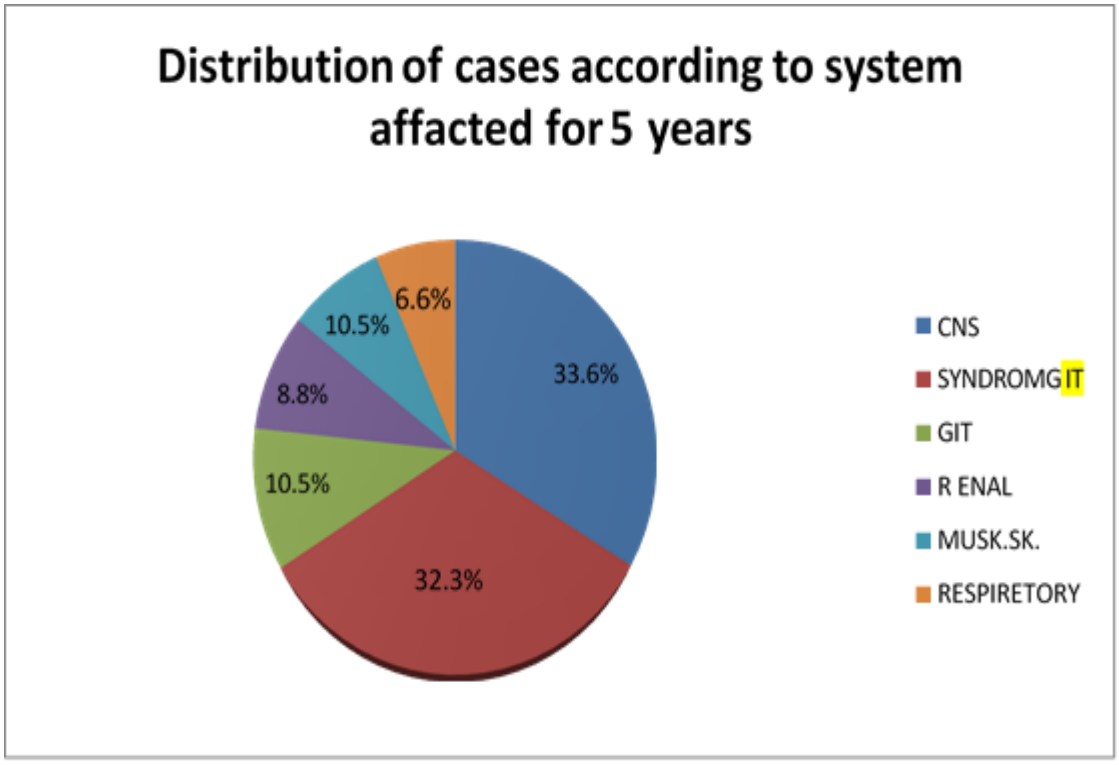

Figure (1) Distribution of cases according to system affected for 5 years

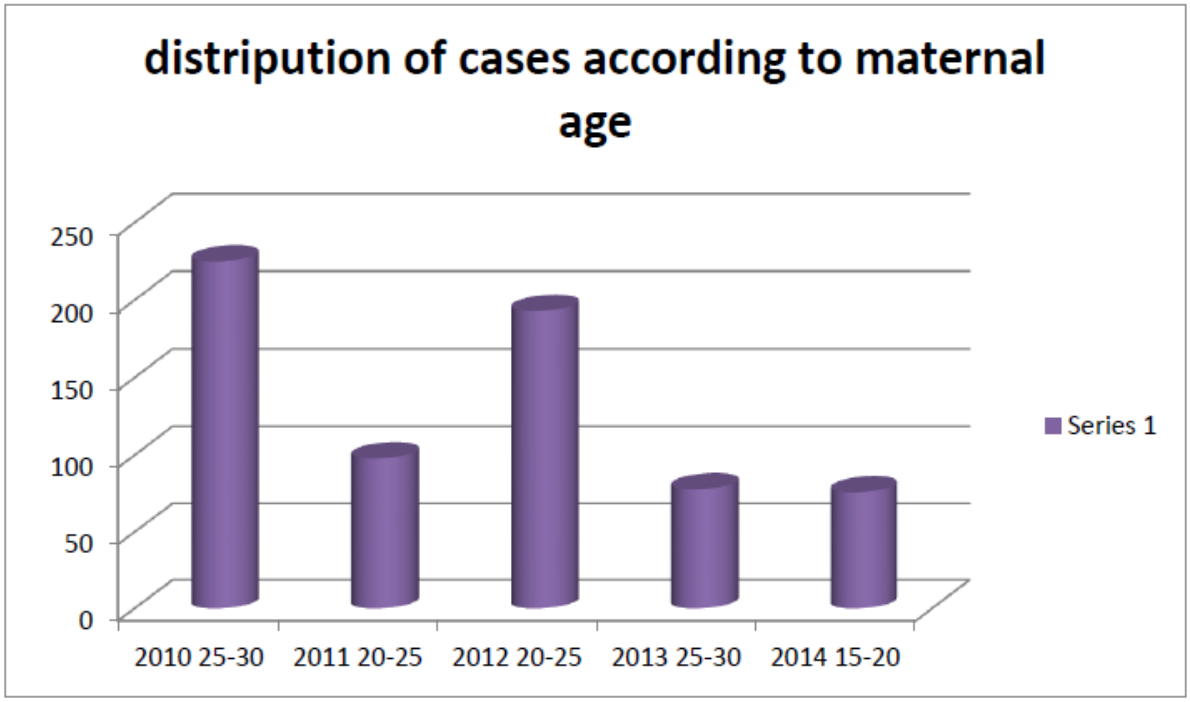

Figure 2 :Distribution of cases according to maternal age. Our study showed that the maternal age was an important risk factor for most of the malformations

Table (3) The distribution of cases according the risk factors(family hx,maternal chronic disease, drugs and x-ray exposure

Years	Total no.	family hx no. (%)	Chronic disease no.(%)	Drug hx no(%)	X _ray exposure no.(%)
2010	225	27 (12%)	14(6.2%)	9(4%)	ZERO
2011	98	11(11,2%)	12 (12.2)	2 (2%)	1 (1%)
2012	193	21(10.8%)	24(12.4)	3(1.5%)	ZERO
2013	78	9(11.5%)	8(10.2)	7 (9%)	1 (1%)
2014	76	8(10.5%)	4(5.2)	2 (2.6)	ZERO
Total no &%	670	76 (11.3)	62(9.2%)	23(3.4%)	0.2%

our study showing high relation between congenital anomalies and maternal risk factor as in table no 3.

Discussion

In the present study, the prevalence of congenital malformations among 50,719 live births was 1.3% .this agrees with National Neonatal Perinatal database with a network of 17 hospitals in India reported prevalence of congenital malformation as 17/1000(22).. but it was much less than the Birth Defe Registry under auspices of the non-governmental sector reported 1750 cases of birth defects among 185,849 births with a crude birth prevalence of 9.42/1000.(23). this is because they took a large data from 5 big hospitals and they used the prenatal scan for the diagnosis of the congenital anomalies. In our study the prevalence was slightly higher in male than female , as male to female ratio was 1.5:1 . This finding was in accordance with the Iranian study (24)this study showed that the commonest anomalies were neurological ones (33.6%), to be followed by syndromes (32.3%), then gastrointestinal tract anomalies (10.5%); among the neurological anomalies, the neural tube defects was the commonest ones. Different observations were recorded in other studies , A study in India(25,26)revealed increase in frequency of

musculoskeletal anomalies ,(%30)neurological (20.5%), then cleft lip and palate; (%18.5)other studies in Iran and Tunis (27,28) showed higher incidence of cleft lip and palate; while a study in Saudi Arabia(29) reported that major anomalies are genitourinary (25%), Cardiovascular (15%) then neurological (10%) . This partly implies a poor compliance of pregnant women regarding the intake of folic acid, in addition to poor antenatal care in regard to screening for such anomalies. The neurological anomalies in this study was 33.6%, while in Wales ,49 (%1) and in Germany (2%) 50) ; this could be related to inadequate education of our people in regard to supplementation of folic acid during pregnancy and poor antenatal care, while in Wales and Germany, there are facilities for prenatal diagnosis and interruption of affected pregnancy.

The chromosomal abnormalities in this study was 32.3% which was much higher than the study of United Kingdom (30) and Norway (31).this is because they took only the trisomy 21.

Our study showed that parental consanguinity was an important cause for most of the malformations. this study showed that the percentage of occurrence of congenital abnormalities was 70.1% among newborns delivered to consanguineous parents, which is similar to the figure in India and Iran and Saudi Arabia studies(29,32). Despite the high prevalence of consanguineous marriages, the overall incidence of congenital abnormalities was not higher than developed countries (33).

The number of cases with congenital abnormalities was very high among mothers aged 20 to 30 years (594 cases(88.5%)), as proved in this study .A nother study done in England, who concluded that the increasing age of the mother may increase the risk of congenital abnormalities especially chromosomal defects (34) , which may be attributable to the fact that this age is a common age of child bearing and higher fertility rate that is why most congenital abnormalities can be diagnosed in this age group.

Regarding this study showed that there is significant family history of congenital abnormalities, as there were Thirteen (11.3%) cases reported to have such a history which could be explained by the fact that most anomalies would be the result of genetic inheritance or mutation of certain gene in the family. This had been approved by a study done in (Tokyo by Otake, M, Schull, WJ, Yoshimaru) (35) which revealed high frequency of congenital anomalies (10 % out of 1000 famalies with history of congenital anomalies. this study showed that the diseases during pregnancy with drugs taken during such period were relatively insignificant regarding the occurrence of congenital abnormalities in newborns, as only 9,2% mothers had disease during pregnancy took drugs. This could be due to that either most pregnant ladies in our society have no regular antenatal care follow up so most diseases passed undiagnosed, or the pregnant women who had medical disease during their pregnancy are well controlled by medication that had no impact on growing fetus.

Conclusion

Neurological anomalies, especially neural tube defects, are the most common type of congenital abnormalities in newborn infants with CNS relatively higher male than female infants. Fallowed by syndromes especially (down syndrome)

Conflict of interest

the author decelerate any conflict

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