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A Study of Postnatal Congenital Anomalies in Neonates in a Teaching Institute

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ABSTRACT

This study aimed to find out the incidence of postnatal congenital anamolies and to find out incidence of various congenital anomalies in still birth. Preterm delivery among 9.4% of the cases and term delivery among 90.6% of the cases. Based on the birth, live birth was recorded among 99.5% of the participants while 0.5% still birth was recorded in our study. Birth weight was found to be VLBW, LBW and normal among 0.9%, 3.8% and 95.3% of the babies. In this recent study congenital malformation was noted among 2.1% of the newborns., however 97.9% of the newborns had no congenital malformations. On assessing the number of congenital malformations multiple malformations was noted among 0.2% of the babies, single malformation among 1.9% of the babies. Nervous system was involved among 11.1% of the babies, Circulatory system among 15.3% of the babies, musculoskeletal system involved among 19.4% newborns while GIT and Genito-Urinary system malformation was found among 20.8% and 27.8% of the cases respectively. Among 5.6% of the cases other system was involved in this present study. With respect to nervous system involvement 37.5%, 25%, 25% and 12.5% newborns had hydrocephalous, myelomeningeocele, closed sacral spina Bifida and vermian agenesis respectively. Similarly Congenital Anomalies (CA) in the circulatory system was noted to be ASD, TOF, Ectopiacordis, other cardiac anomalies and Single UA among 27.3%, 36.4%, 9.1%, 18.2% and 9.1% in this study respectively. Musculoskeletal anomalies was found to be Congenital Dislocation of Hip, Talipesequinovarus, OsteogenesisImperfecta, Omphalocele and Diagphrematic hernia among 7.1%, 57.1%, 14.3%, 7.1% and 14.3% of the newborns respectively. In this study 28.8% and 71.2% of the newborns had CA who had previous CA and no CA history respectively. In this study the association between participants with CA and without CA based on previous CA in their newborns was statistically significant with p value noted as <0.0001. Among CA cases 21.2% were stillbirth and 77.3% are live birth. Among cases with CA 18.2%, 53% and 28.8% of the babies were VLBW, LBW and normal respectively while among babies without CA 0.6%, 2.7% and 96.7% were VLBW, LBW and normal respectively. The association between newborns with and without CA based on birth weight was statistically significant (p value=<0.0001). The mean birth weight of babies born with CA was 1236.7±257.5gms while the mean birth weight of babies born with no CA was 2654.1±351.8gms. There was significant difference noted for birth weight between the babies born with and without CA (p=<0.00010).

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Key Words
Congenital anomalies, ectopiacordis, cardiac anomalies

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INTRODUCTION

Congenital abnormalities/anomalies, CAs, and birth defects are all terminology used to refer to developmental problems that are evident at birth[1]. Congenital abnormalities are the result of early foetal developmentally faulty morphogenesis. A broader meaning encompasses cellular metabolic or microscopic flaws. Major defects have negative effects on health, surgery, and appearance[2]. The WHO states that the term "CAs" should only refer to birth abnormalities that are structural. Although external risk factors are well known and preventable, the precise cause of CAs is still unknown. The frequency of CAs at birth varies greatly from country to country, according to a general surveillance programme that has been running since 1960 to track the occurrence of CAs in different populations around the world[3]. Social, racial, ecological and economic variables are to blame for these variances[4,5]. The major cause of foetal death, childhood and adult morbidity, as well as preterm delivery and foetal death, are CAs. Due to advances in assisted reproductive technologies and advancing maternal age at conception, CAs have increased significantly during the past few decades[6-8]. About 1 in 33 infants are impacted by CAs, which results in 6.6% infant mortality and substantial morbidity in children[9]. According to a community-based study by the ICMR, congenital abnormalities were responsible for 6.6% of infant fatalities in both rural and urban slum populations[10]. In India, CAs are also responsible for 8-15% of prenatal mortality and 13-16% of neonatal deaths[11,12]. Pediatricians have a comparatively uncommon but extremely challenging task when dealing with patients who have several CAs. Due to improvements in prenatal and neonatal care, the percentage of perinatal deaths caused by congenital abnormalities is rising while mortality from other causes is down. In facilities offering quality newborn care, this will rank as one of the major causes of death and morbidity in the ensuing decades. CAs are prenatal illnesses that can be brought on by chromosomal abnormalities, environmental teratogens, gene mutations, multi factorial syndromes and vitamin deficiencies. Other factors that contribute to CAs include maternal rubella, DM, iodine and folic acid deficiencies, some medications, substance addiction, pollutants and irradiation. The frequency and requirements for CAs vary from country to country and region to region. This depends on how they were defined, how they were discovered, how long the population was observed and the ethnic and socioeconomic makeup of the community under investigation[13]. Major CAs require surgical treatment or possibly have the potential to kill the newborn., mild CAs do not. Minor CAs have a negative impact on newborn health and quality of life[14]. Worldwide, they are regarded as the primary contributors to prenatal mortality, morbidity and impairment in children[15]. In 60% of cases, these can be avoided[16], although epidemiological data is required. CAs are associated with negative pregnancy outcomes, including IUGR, preterm birth, breech presentations, preeclampsia, placental abruption and perinatal and neonatal death and morbidity[17]. CAs are becoming a significant prenatal concern that significantly contributes to perinatal death and morbidity with significant effects on mothers and families impacted. The best chances of survival with these infants are with early detection, surgical correction, or palliation, therefore the life-threatening CAs must be discovered by careful clinical examination[18]. The majority of earlier research has concentrated on infections and how they affect infants and children. The incidence rates and outcomes related to CAs have only been the subject of a very small number of research. With these contexts in mind, this investigation was carried out to determine the precise current burden of CAs in a tertiary care hospital.

Aims and objectives: To find out the incidence of postnatal congenital anamolies and to find out incidence of various congenital anomalies in still birth.

MATERIALS AND METHODS

Study Design: A cross-sectional study was conducted to assess the incidence of Cas.

Study Area: Department of Paediatrics, Fathima Institute of Medical Sciences, Kadapa, A.P.

Study Population: Newborns who were born in the study center.

Inclusion Criteria:

- Neonates who were born in study centre.
- Gestational age of mothers between 28-42 weeks.

Exclusion Criteria:

- Mothers who refused to participate in the study.

Sample Size: All deliveries which occurred during the study period after assessing the inclusion and exclusion criteria were decided to be included in the study. Hence at the end a total of 3084 newborns were included in the study.

Data Collection: After taking the written informed consent and assent, all mothers were assessed for the demographic and clinical presentation by the principal investigator using a pre structured proforma. Following which the principal investigator assessed the detailed history of the participants from their parents and clinical examination was done on newborns. All the reports from both cases and controls were entered in

the same proforma where clinical presentation was entered by the principal investigator.

Data Analysis: The data was entered in excel sheet and analyzed using SPSS (Version 16). Descriptive statistics with mean, standard deviation and proportions (%) were calculated for quantitative variables. To test the hypothesis Chi Square test was used. p value <0.05 was considered as statistically significant.

RESULTS AND DISCUSSIONS

In this study to find congenital postnatal anomalies in neonates, the age of mothers were ≤25 years, 26-30 years, 31-35 years and > 35 years among 18.8%, 36.7%, 30.9% and 13.5% of the mothers respectively. Among the study participants 52.4% of the mothers were multiparous while 47.6% of the mothers were primipara. In this current study 10.1% of the parents took treatment for infertility while 89.9% had no history of treatment for infertility. Based on previous history of congenital anomalies 2.9% of the study participants had congenital anomalies among their babies while 97.1% of the participants had no congenital anomalies. Regarding consanguinity 18.2% of the participants had consanguineous marriage whereas 81.8% of the participants had no consanguinity. The mean GA among the study subjects was noted to be 39.3±2.4 weeks. A at delivery was found to be preterm delivery among 9.4% of the cases and term delivery among 90.6% of the cases. Based on the birth, live birth was recorded among 99.5% of the participants while 0.5% still birth was recorded in our study. The gender of newborns in this current study was male babies among 48.6% of the others and female babies among 51.4% of the mothers. Birth weight was found to be VLBW, LBW and normal among 0.9%, 3.8% and 95.3% of the babies. The mean birth weight of newborns was noted to be 2684.8± 346.7gms. In this recent study congenital malformation was noted among 2.1% of the newborns; however 97.9% of the newborns had no congenital malformations. On assessing the number of congenital malformations multiple malformations was noted among 0.2% of the babies, single malformation among 1.9% of the babies. Nervous system was involved among 11.1% of the babies, Circulatory system among 15.3% of the babies, musculoskeletal system involved among 19.4% newborns while GIT and Genito- Urinary system malformation was found among 20.8% and 27.8% of the cases respectively. Among 5.6% of the cases other system was involved in this present study. With respect to nervous system involvement 37.5%, 25%, 25% and 12.5% newborns had hydrocephalous, myelomeningeocele, closed sacral spina Bifida and vermian agenesis respectively. Similarly CA in the circulatory system was noted to be ASD, TOF, Ectopiacordis, other cardiac anomalies and Single UA among 27.3%, 36.4%, 9.1%, 18.2% and 9.1% in this study respectively. Musculoskeletal anomalies was found to be Congenital Dislocation of Hip, Talipesequinovarus, OsteogenesisImperfecta, Omphalocele and Diagphrematic hernia among 7.1%, 57.1%, 14.3%, 7.1% and 14.3% of the newborns respectively. In GIT system Cleft lip, Cleft palate, Both Cleft lip and palate, Imperforate Anus and Atresia was seen among 20%, 20%, 6.7% and 26.7% of the cases in our study. Genito urinary systemanomalies like Hydronephrosis, Hypospadias, Undescended testis, Renal Agenesis, PUJ obstruction and Polycystic kidney was recorded among 20%, 15%, 10%, 20%, 20% and 15% off the cases respectively. Other anomalies like ear tags and Down syndrome was noted among 75% and 25% of the cases respectively, in this study. Among newborns with CA, 6.1%, 22.7%, 27.3% and 43.9% of the mothers were in the age group of = 25 years, 26-30 years, 31-35 years and >35 years respectively. The association for maternal age among participants with CA compared to without CA was significant (p value =<0.0001). Based on the parity status of babies with CA 37.9% of their mothers were primipara while 62.1% of the mothers were multipara compared to babies without congenital anomalies were 47.6% of the mothers are primipara and 52.4% of the cases are multipara. There was no association recorded to be significant in this study for parity status (p value =0.1087). Among parent who had taken infertility treatment 19.7% of the babies had CA while 80.3% of the babies with CA had no history of infertility treatment among their parents. The association between participants with and without CA in newborn based on infertility treatment was significant (p value =0.0094). In this study 28.8% and 71.2% of the newborns had CA who had previous CA and no CA history respectively. In this study the association between participants with CA and without CA based on previous CA in their newborns was statistically significant with p value noted as <0.0001. Among cases with and without consanguinity 33.3% and 66.7% babies had CA. There was significant association noted for consanguinity between babies with and without CA, the p value was registered as <0.0001. The mean GA of newborns with CA was 34.7±4.7 weeks whereas the mean GA among babies without CA was 38.6±1.4 weeks. The difference in mean GA between cases with CA and without CA was statistically significant with p value of <0.0001. Among 36.4% of the cases with CA the delivery was preterm while among 63.6% of the cases with CA the GA at delivery was term. Similarly among cases without CA 8.8% of the babies was preterm and 91.2% of the cases were term. The association between GA at delivery between new borns with and without CA was statistically significant (p value=<0.0001). Among CA cases 21.2% were stillbirth and 77.3% are live birth. The association for

birth status between babies with CA and without CA was significant with p value of <0.0001. In this study among newborns with CA 47% of them were males and 53% of them were females whereas among newborns without CA 48.6% were males and 51.4% of the cases were females. The association between CA and non-CA cases based on gender was not significant (p value =0.8523). Among cases with CA 18.2%, 53% and 28.8% of the babies were VLBW, LBW and normal respectively while among babies without CA 0.6%, 2.7% and 96.7% were VLBW, LBW and normal respectively. The association between newborns with and without CA based on birth weight was statistically significant (p value=<0.0001). The mean birth weight of babies born with CA was 1236.7±257.5gms while the mean birth weight of babies born with no CA was 2654.1±351.8gms. There was significant difference noted for birth weight between the babies born with and without CA (p value=<0.00010).

In this current study 10.1% of the parents took treatment for infertility while 89.9% had no history of treatment for infertility. Based on previous history of congenital anomalies 2.9% of the study participants had congenital anomalies among their babies while 97.1% of the participants had no congenital anomalies. Regarding consanguinity 18.2% of the participants had consanguineous marriage whereas 81.8% of the participants had no consanguinity. The mean GA among the study subjects was noted to be 39.3±2.4 weeks. GA at delivery was found to be preterm delivery among 9.4% of the cases and term delivery among 90.6% of the cases. Based on the birth, live birth was recorded among 99.5% of the participants while 0.5% still birth was recorded in our study. The gender of newborns in this current study was male babies among 48.6% of the others and female babies among 51.4% of the mothers. Birth weight was found to be VLBW, LBW and normal among 0.9%, 3.8% and 95.3% of the babies. The mean birth weight of newborns was noted to be 2684.8±346.7gms. In this recent study congenital malformation was noted among 2.1% of the newborns., however, 97.9% of the newborns had no congenital malformations. On assessing the number of congenital malformations multiple malformations was noted among 0.2% of the babies, single malformation among 1.9% of the babies. Nervous system was involved among 11.1% of the babies, Circulatory system among 15.3% of the babies, musculoskeletal system involved among 19.4% newborns while GIT and Genito-Urinary system malformation was found among 20.8% and 27.8% of the cases respectively. Among 5.6% of the cases other system was involved in this present study. With respect to nervous system involvement 37.5%, 25%, 25% and 12.5% newborns had hydrocephalous, myelomeningeocele, closed sacral spina Bifida and vermian agenesis respectively. Among newborns with CA, 6.1%, 22.7%, 27.3% and 43.9% of the mothers were in the age group of ≤25 years, 26-30 years, 31-35 years and >35 years respectively. The association for maternal age among participants with CA compared to without CA was significant. Based on the parity status of babies with CA 37.9% of their mothers were primipara while 62.1% of the mothers were multipara compared to babies without congenital anomalies were 47.6% of the mothers are primipara and 52.4% of the cases are multipara. There was no association recorded to be significant in this study for parity status. Among CA cases 21.2% were stillbirth and 77.3% are live birth. The association for birth status between babies with CA and without CA was significant. In this study among newborns with CA 47% of them were males and 53% of them were females whereas among newborns without CA 48.6% were males and 51.4% of the cases were females. The association between CA and non-CA cases based on gender was not significant. Among cases with CA 18.2%, 53% and 28.8% of the babies were VLBW, LBW and normal respectively while among babies without CA 0.6%, 2.7% and 96.7% were VLBW, LBW and normal respectively. The association between newborns with and without CA based on birth weight was statistically significant. The mean birth weight of babies born with CA was 1236.7±257.5gms while the mean birth weight of babies born with no CA was 2654.1±351.8gms. There was significant difference noted for birth weight between the babies born with and without CA. Findings of the present study was comparable with the following studies. Chinara[19] revealed that in their investigation, congenital abnormalities affected still horns (6.6%) more than living horns (1.9%), a significant difference. 34 percent of the 32 live births of abnormal children were preterm. The MSS, GIS and CNS were the parties most commonly involved. Khalil[20] reported that 3.9/1000 live newborns in their study had CHD. Preterm births had a greater incidence of CHD than full-term live babies. Echocardiography, which includes 2D, Doppler, and colour flow imaging, was used to confirm the diagnosis. Twenty eight percent of newborns with CHD also had additional somatic defects, the most prevalent of which was Down syndrome (9.3%). The most frequent lesions were PDA (41.9%) and VSD (34.9%), with incidences of 1.6 and 1.4/1000 live births, respectively. PDA incidence was likely increased due to the greater number of pre-term births. 34.9% of infants with CHD died during follow-up between 6 and 18 months. In 20% of the deceased, the CHD diagnosis was confirmed at autopsy.

CONCLUSION

In the present study congenital malformation was noted among 2.1% of the newborns., however 97.9% of the newborns had no congenital malformations. Nervous system was involved among 11.1% of the

babies, Circulatory system among 15.3% of the babies, musculoskeletal system involved among 19.4% newborns while GIT and Genito-Urinary system malformation was found among 20.8% and 27.8% of the cases respectively. Among 5.6% of the cases other system was involved in this present study. In this study, the presence of CAs were found to be associated with increasing maternal age, history of treatment for infertility, congenital anomalies in previous delivery, consanguinity, gestational age at delivery, still birth and birth weight. However, Parity and gender of newborns were not linked with the presence of Cas. We conclude that the burden of congenital anomalies are not negligible and thus more efficient antenatal screening tools needs to be addressed in order to identify the CAs at early stages of pregnancy and further prompt actions can be taken up, accordingly.

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