ORIGINAL RESEARCH PAPER

Volume-8 | Issue-4 | April-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

FREQUENCIES OF BIRTH DEFECTS REPORTED AT DISTRICT LEVEL SPECIAL CARE NEWBORN UNIT IN SOUTH KASHMIR.

Neonatology

Aasif Aziz Wani Consultant Pediatrics G.M.C Anantnag Kashmir.

Shazia Ashraf* Senior Resident anaesthesia G.M.C Srinagar. *Corresponding Author

ABSTRACT

Introduction: Congenital anomalies figure as fifth largest cause of neonatal mortality in India. Their pattern and frequency differs in different parts of world and hence prevalence studies need to be done.

Material and Methods: A prospective hospital-based study was conducted at maternity and child health hospital Anantnag from June 2017 to May 2018. All neonates born with congenital anomalies were included in the study and complete maternal data and clinical examination supplemented with radiological or sonographic studies was done. Data was analysed in Microsoft excel and expressed as frequencies and percentages.

Results: Out of total 65 babies with CA around 56% were males; 43% were preterm, 61% were low birth weight. 60% babies were born by consanguinity. There was bimodal age of distribution in mothers; in less than 20 yrs (30%), and greater than 30 years (46%). Congenital heart disease (21%) and central nervous system anomalies (20%) followed by musculoskeltal anomalies (15%) were the commonest anomalies encountered.

Conclusion: The pattern of congenital anomalies is similar to other parts of northern India. Prenatal diagnosis and preventive measures like folic acid supplementation can pave a long way in prevention of a sizable fraction of congenital anomalies at least of neural tube defects.

KEYWORDS

congenital malformation, neural tube defects, congenital heart disease, folic acid supplementation.

INTRODUCTION

Congenital anomalies include all structural and functional alterations in embryonic or fetal development resulting from genetic, environmental or unknown causes, which result in physical and/or mental impairment. These defects may be isolated or multiple and are due to multiple etiological factors.(Obu, Chinawa, Uleanya, Adimora, & Obi, 2012) While the highest contributors to neonatal deaths in India were preterm births (34.7%), intrapartum complications (19.6%), pneumonia (16.3%) and neonatal sepsis (15%), congenital anomalies constituted the fifth largest cause, being responsible for an estimated 9% of neonatal deaths in the year 2010. (Liu et al., 2012) Owing to advancement in healthcare delivery especially in urban areas in India, and control of infectious diseases the proportion of mortality due to congenital anomalies is likely to increase. Global estimates suggest that congenital anomalies affect 2–3% of births. (Dolk, Loane, & Garne, 2010)

Any insult during the period of organogenesis in 3rd to 8th weeks of gestation, can cause a congenital abnormality. This is the period where preventive intervention strategy will reduce the incidence of developing CMs. (Obu et al., 2012) The etiology of CMs may be genetic, environmental or unknown. Among genetic causes, 6% are due to chromosomal abnormality, 25% single-gene disorders, and 20-30% multifactorial. In 50% cases, the cause is unknown.(Sayee Rajangam, n.d.) Low birth weight babies are particularly at risk (Obu et al., 2012) and consanguineous marriages have higher incidence of congenital malformations.(Sayee Rajangam, n.d.) Other risk factors are maternal age, drug intake, teratogens, radiation exposure, maternal illnesses, smoking and alcohol consumption. (Perveen & Tyyab, 2007) Although different studies have been conducted in India, no study of prevalence or pattern of congenital anomalies is available in Kashmir province. This study was done to quantify the magnitude of this problem and to consequently prioritize resources for preventive and diagnostic modalities.

MATERIAL AND METHODS:

A prospective hospital-based study was conducted from June 2017 to May 2018 in maternity and child health hospital Anantnag, which has an attached special newborn care unit (SNCU).

INCLUSION CRITERIA: All women who gave birth to babies with structural defect after 24 weeks of gestational age.

Proper neonatal examination to detect any kind of birth anomaly was done by the pediatrician at the time of admission. A complete proforma of risk factors including age, residence, booked/un-booked ante-natal status of mother, estimated period of gestation, gravidity, sex of newborn, type of delivery was filled. Ultrasonography and radiological investigations were performed by the hospital radiologist to detect and rule out multiple internal anomalies. Echocardiography and genetic studies were requested when required from our nearest tertiary care centers at Srinagar. Consent was taken beforehand from parents.

Data was analysed using Microsoft excel. The patient's variables were reported as percentages or mean ± standard deviation (SD).

Approval of institutional ethics committee was taken before the study.

RESULTS

A total of 3500 neonatal admissions were recorded from June 2017 to May 2018 . During the study period a total of 65 babies with various congenital anomalies were admitted resulting in incidence of around 18.5/1000 live births. Four babies were infants of diabetic mothers, two mothers were treated for hypothyroidism and ten mothers had pre-eclampsia. Oligohydramnios was present in six mothers. The maternal and other demographic variables are summarized in Table 1.

TABLE 1: MATERNAL CHARACTERISTICS

VARIABLES		Number	Percentage
GENDER	MALE	37	56.9
	FEMALE	28	43.07
GESTATION	TERM	30	46.1
	PRETERM	28	43.07
	POST TERM	7	10.7
WEIGHT	LBW	40	61.5
	AGA	20	30.7
	LGA	5	7.6
CONSANGUINITY	YES	40	61.5
	NO	25	38.4
FAMILY HISTORY	YES	28	43.07
	NO	37	56.9
GRAVIDITY	FIRST	20	30.7
	TWO OR MORE	45	69.2
MATERNAL AGE	<20 YEARS	20	30.7
	20-30 YEARS	15	23.07
	>30 YEARS	30	46.1
BOOKED CASE	YES	25	38.4
	NO	40	61.5
DELIVERY	CAESAREAN	30	46.1
	VAGINAL	35	53.8

Congenital heart disease was the commonest followed by CNS anomalies, musculoskeltal anomalies, renal and urogenital anomalies, gastrointestinal anomalies, oro-oculo-facial and some well recognized syndromes(down's syndrome, pierre robin sequence, trisomy 18 etc). Table 2

TABLE 2: CONGENITALANOMALIES

SYSTEM	MALFORMATION	Frequency	Percentage
Central Nervous System	Anencephaly	3	20
	Hydrocephalus/Microcephaly	2	
	Spina Bifida	8	
Musculoskeltal System	Amniotic Band sequence	4	15.3
	Polydactyly/syndactyly	3	
	Talipes	3	
Renal and Urogenital	Hydronephrosis	3	10.7
	Polycystic kidney	1	
	Undescended testis	1	
	Ambiguous genitalia	1	
	Epispadias/ Hypospadias	1	
Digestive tract	Trachea-esophageal fistula/atresia	1	6
	Diaphragmatic hernia	1	
	Duodenal atresia	1	
	Anorectal malformation	1	
Syndromes	Down's	5	10.7
	Edward	1	
	Pierre robin sequence	1	
Cardiovascular	Cyanotic	6	21.5
	Acynotic/complex	8	
Oro/ facio/ ocular	Cleft lip/palate	3	7.6
	Abnormal pinna/canal	1	
	Micropthalmia/buphthalmos	1	
Skin	Congenital icthyosis	2	7.6
	Congenital epidermolysis bullosa	3	

DISCUSSION

Our study focused on the first neonatal examination in special care newborn unit (SNCU). The problem with hospital based cross sectional studies is that they do not consider the whole spectrum of congenital anomalies which may be occurring in the community. A well designed longitudinal study has a lot of financial implications which may not always be feasible. Our study gave an incidence of around 18/1000 in hospital admissions. Worldwide congenital malformations have an incidence of around 3-7% but vary from country to country.(K.Park, 2005) One more limitation is that we have not included stillbirths and abortion cases in our data as we do not have the requisite facilities and parents would not allow for the same due to social and religious factors. It is an established fact that there is manifold increased incidence of congenital and chromosomal anomalies in stillborn and aborted fetuses. '(Dr. Akruti Parmar & , Dr. S.P.Rathod , Dr. S. V. Patel, 2010)

Most common anomalies reported in our study were those of central nervous system followed by musculoskeltal system, digestive system and genitourinary in that order. A similar order was observed in a study in Saudi Arabia (Asindi, Al Hifzi, & Bassuni, 1997) and Iran.(Abdi-Rad, Khoshkalam, & Farrokh-Islamlou, 2008) A similar study in our country revealed first ranking for CNS followed by Musculoskeletal and then cardiovascular system.(Gupta S, Gupta P, 2012) Neural tube defects including anencephaly were the commonest visible birth defects in our study. The prevalence of NTD is approximately 1-5/1000 live births and the risk of recurrence is 2-3%. Northern states, namely Punjab, Haryana, Rajasthan and Bihar have recorded the highest prevalence of neural tube defects.(Verma, 2000) The prevalence of NTD is approximately 1-5/1000 live births and the risk of recurrence is 2-3%.(Hall JG, 1994) Neural tube defects (NTDs) like anencephaly are potentially preventable through a low cost primary prevention method of pre- conception folic acid supplementation. ("Prevention of neural tube defects: results of the Medical Research Council Vitamin Study. MRC Vitamin Study Research Group.," 1991),(Berry et al., 1999) Talpes was the second commonest anomaly documented in our study. Community based studies have reported a higher prevalence of musculoskeletal anomalies, with talipes, a potentially treatable anomaly, being reported as the most common congenital anomaly among live births.(Bhide & Kar, 2018)

Male babies outnumbered females in the malformed group. The biological fragility of the male fetus and higher risk from obstetric catastrophes culminating in a higher incidence of congenital deformities in males has been postulated, although the fact cant be generalized yet.(Kraemer, n.d.) Some studies, however, have reported no overall differences in sex of the babies with CAs. '(Dr. Akruti Parmar & , Dr. S.P.Rathod , Dr. S. V. Patel, 2010)

Although preterm babies have been reported to have higher congenital anomalies(Oliveira, Richieri-Costa, Carvalho Ferrarese, Móz Vaz, & Fett-Conte, 2011) (Taksande, Vilhekar, Chaturvedi, & Jain, 2010) our study didn't document the same. A study in Pakistan showed similar higher incidence in term and post term babies. (Ali Khan, Azam Khattak, Hamid Ali Shah, Roshan, & Ul Haq, 2012) However there was definite increase in prevelance of congenital anomalies in LBW babies; and it is in concordance with several other studies.(Ali Khan et al., 2012) (Oliveira et al., 2011) (Taksande et al., 2010) Many of the babies were LSCS born probably because of fetal indications in these cases. Similar risk factors were reported earlier.(Taksande et al., 2010) (Gul, Jabeen, & Khan, 2012)

We observed a bimodal pattern in the incidence of CAs with regards to maternal age, similar to figures reported by other studies. (Singh & Gupta, 2009) There was higher incidence in age group > 30 years. Similarly less than 20 year maternal age group carried the higher incidence. Same findings were documented by other investigators.(Grover, 2000) (Dutta & Chaturvedi, 2000) (Khatami & ", 2005)

High incidence of CM among gravida 2 or more than primigravida was reported by our study and was similar to earlier reports. (Taksande et al., 2010)(Gul et al., 2012)

Consanguinity was significantly associated with increased rate of congenital malformations as reported by other authors too. (Grover, 2000) (Khatami & ", 2005) Increased incidence of CM in consanguineous couples is due to homozygous expression of recessive genes.(Tayebi, Yazdani, & Naghshin, 2010)

CONCLUSION

This study delineated the local pattern of congenital anomalies in rural Kashmir, and it shows a similarity of the pattern as in other parts of our country. Also it emphasizes that many of the anomalies can be prevented by low cost community interventions like preconceptional folic acid supplementation in women. Maternal disease prevention and treatment, avoidance of unnecessary drug/ teratogen exposures, routine antenatal screening and offering early termination in affected pregnancies can be helpful in preventing congenitally malformed newborns.

REFERENCES

1. Abdi-Rad, I., Khoshkalam, M., & Farrokh-Islamlou, H.-R. (2008). The prevalence at birth of overt congenital anomalies in Urmia, Northwestern Iran. Archives of Iranian Medicine, 11(2), 148–151. https://doi.org/08112/AIM.005
2. Ali Khan, A., Azam Khattak, T., Hamid Ali Shah, S., Roshan, E., & Ul Haq, A. (2012). Pattern of Congenital Anomalies in the Newborn. Journal of Rawalpindi Medical College (JRMC) (Vol. 16). Retrieved from https://pdfs.semanticscholar.org/ 2294/2de27d2607a9ea6a080a9ced8db004124512.pdf
3. Asindi, A. A., Al Hifzi, I., & Bassuni, W. A. (1997). Major congenital malformations among Saudi infants admitted to Asir Central Hospital. Annals of Saudi Medicine, 17(2), 250–253. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/17377444
4. Berry, R. J., Li, Z., Erickson, J. D., Li, S., Moore, C. A., Wang, H., … Correa, A. (1999). Prevention of Neural-Tube Defects with Folic Acid in China. New England Journal of Medicine, 341(20), 1485–1490. https://doi.org/10.1056/NEJM199911113412001
5. Bhide, P., & Kar, A. (2018). A national estimate of the birth prevalence of congenital anomalies in India: systematic review and meta-analysis. BMC Pediatrics, 18(1), 175. https://doi.org/10.1186/s12887-018-1149-0
6. Dolk, H., Loane, M., & Garne, E. (2010). The Prevalence of Congenital Anomalies in Europe. In Advances in experimental medicine and biology (Vol. 686, pp. 349–364). https://doi.org/10.1007/978-90-481-9485-8_20
7. Dr. Akruti Parmar, & , Dr. S.P.Rathod , Dr. S. V. Patel, D. S. M. P. (2010). A Study of Congenital Anomalies In Newborn -. National Journal of Integrated Research in Medicine, 1(1), 13–17. Retrieved from http://www.scopemed.org/?mno=3730
8. Dutta, V., & Chaturvedi, P. (2000). Congenital malformations in rural Maharashtra. Indian Pediatrics, 37(9), 998–1001. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/10992337
9. Grover, N. (2000). Congenital malformations in Shimla. Indian Journal of Pediatrics, 67(4), 249–251. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/10878862
10. Gul, F., Jabeen, M., & Khan, A. S. (2012). FREQUENCY OF CONGENITAL MALFORMATIONS AND ASSOCIATED RISK FACTORS AT LIAQAT MEMORIAL HOSPITAL, KOHAT. Retrieved from https://www.semanticscholar.org/paper/ FREQUENCY-OF-CONGENITAL-MALFORMATIONS-AND-RISK-AT-Gul-Jabeen/feab775d18edfb697ffa5b10cb1e1f0d42827f0f
11. Gupta S, Gupta P, S. J. S. (2012). A study on incidence of various systemic congenital malformations and their association with maternal factors. Natl J Med Research 2012; 2: 19-21, 2, 19–21.
12. Hall JG, S. F. (1994). Genetics of neural tube defects. Ment Retard Dev Disability, 4, 269–281.
13. K.Park. (2005). Park'S Text Book of Preventive and Social Medicine (15th editi). BANARSIDAS BHANOT PUBLISHERS.
14. Khatami, "F, & " G. A. M. (2005). Survey of congenital major malformation in 10,000 newborns. Iranian Journal of Pediatrics, 15(4), 315–320. Retrieved from http://ijp.tums.ac.ir/ index.php/ijp/article/view/560

15. Kraemer, S. (n.d.). The fragile male. BMJ (Clinical Research Ed.), 321(7276), 1609–1612. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11124200
16. Liu, L., Johnson, H. L., Cousens, S., Perin, J., Scott, S., Lawn, J. E., … Black, R. E. (2012). Global, regional, and national causes of child mortality: An updated systematic analysis for 2010 with time trends since 2000. The Lancet, 379(9832), 2151–2161. https://doi.org/10.1016/S0140-6736(12)60560-1
17. Obu, H. A., Chinawa, J. M., Uleanya, N. D., Adimora, G. N., & Obi, I. E. (2012). Congenital malformations among newborns admitted in the neonatal unit of a tertiary hospital in Enugu, South-East Nigeria - a retrospective study. BMC Research Notes, 5(1), 177. https://doi.org/10.1186/1756-0500-5-177
18. Oliveira, C. I. F., Richieri-Costa, A., Carvalho Ferrarese, V. C., Móz Vaz, D. C., & Fett-Conte, A. C. (2011). Birth defects in newborns and stillborns: an example of the Brazilian reality. BMC Research Notes, 4, 343. https://doi.org/10.1186/1756-0500-4-343
19. Perveen, F., & Tyyab, S. (2007). Frequency and pattern of distribution of congenital anomalies in the newborn and associated maternal risk factors. Journal of the College of Physicians and Surgeons--Pakistan : JCPSP, 17(6), 340–343. https://doi.org/06.2007/JCPSP.340343
20. Prevention of neural tube defects: results of the Medical Research Council Vitamin Study. MRC Vitamin Study Research Group. (1991). Lancet (London, England), 338(8760), 131–137. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/1677062
21. Sayee Rajangam, R. D. (n.d.). Consanguinity and Chromosomal Abnormality in Mental Retardation and or Multiple Congenital Anomaly. Retrieved from http://medind.nic.in/jae/t07/i2/jaet07i2p30.pdf
22. Singh, A., & Gupta, R. K. (2009). Pattern of congenital anomalies in newborn: A hospital based prospective study. JK Science. https://doi.org/10.9790/0853-1505025659
23. Taksande, A., Vilhekar, K., Chaturvedi, P., & Jain, M. (2010). Congenital malformations at birth in Central India: A rural medical college hospital based data. Indian Journal of Human Genetics, 16(3), 159. https://doi.org/10.4103/0971-6866.73412
24. Tayebi, N., Yazdani, K., & Naghshin, N. (2010). The prevalence of congenital malformations and its correlation with consanguineous marriages. Oman Medical Journal, 25(1), 37–40. https://doi.org/10.5001/omj.2010.9
25. Verma, I. C. (2000). Burden of genetic disorders in India. Indian Journal of Pediatrics, 67(12), 893–898. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/11262988