

Assessment of Potential Risk Factors for Congenital Anomalies in Low Risk population at tertiary care hospital

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ABSTRACT

Aim: To determine the frequency of preventable factors causing congenital anomalies

Methods: This observational study was conducted at Obstetric unit of Govt. Lady Aitchison Hospital, Lahore, from January, 2012 to December, 2012. Patients were admitted through emergency unit & out patients department. Patients' demographic record including age, parity, education, socio-economic status, along with mode of admission, antenatal care status, previous scar (Myomectomy, Cesarean, D&C C -Hysterectomy, Blood transfusion and duration of hospital stay was noted from patients record.

Results: Among total 80 newborns born with anomalies, 47(59%) were males whereas rest of 33(41%) were females. A total of 38(47%) newborns had Hydrocephaly, 25(31%) had Anencephaly, 8(10%) had Arcania, 4(5%) had ompaloccele, 3(4%) had spina bifida and only 2(3%) had Arnold Chiari. A total of 47(59%) subjects were compatible with life, among whom 38(81%) were hydrocephalus whereas only 4(9%) were ompaloccele, 3(6%) were spina bifida and 2(4%) were having Arnold Chiari. The age of mothers of the subjects was ≤ 20 in 40(50%) of the patients, majority of the deliveries 64(80%) were un-booked and 54(67%) mothers were having cousin marriages.

Conclusion: The Hydrocephaly, Anencephaly, Arcania, ompaloccele, spina bifida and Arnold Chiari were most commonly observed types of anomalies in our study. Young maternal age, cousin marriages, intake of drugs, previous baby and family history of anomalies and lack of maternal care were major identified risk factors.

Keywords: Congenital Anomalies

INTRODUCTION

Congenital anomalies are actually the structural defects at the time of birth as defined by the World Health Organization¹. These have become a serious concern for public health and hence emphasis is being made for identification of the risk factors and preventive measures of congenital anomalies. A number of genetic as well as environmental factors contribute to develop the congenital malformations and may result in permanent defects. Due to which infant mortalities have greatly increased in past two decades². The most common defect in all malformations is the NTD (Neural tube defect) that causes infant morbidity and mortality³.

Many clinical studies have presented the epidemiological figures of congenital anomalies. Approximately 495, 000 deaths globally were accounted due to congenital malformations in 1997. Among all these deaths, mostly occurred in the very first year of life and hence it contributed the most to the infant mortality rate i.e., the number of deaths / 1000 live births between the birth and exactly one year of age⁴. One international study demonstrated that the maximum mortality rate was among the

newborns of mothers born in Pakistan (standardised mortality ratio 237), followed by the newborns of mothers born in India (standardised mortality ratio 134), East Africa (standardised mortality ratio 126), and Bangladesh (standardised mortality ratio 118)⁵.

Despite of various descriptive and epidemiologic studies carried out worldwide, not much data is still available in Pakistan. However, one population based study focusing to assess the incidence of specifically cleft lip and palate was conducted in the northern Pakistan. It showed the incidence for cleft lip and / or cleft palate was observed as 1.91 per 1000 births i.e., 1 per 523 births. Cleft lip alone was observed in 42% and hence was more frequently observed than the isolated cleft palate (24%) and also from the combined cleft lip and palate deformities (34%). Male gender was more frequently influenced by the cleft lip and cleft lip with cleft palate whilst females were more frequently affected by the isolated cleft palate⁶. Genetic factors are an obvious cause of these congenital anomalies^{7,8}. The maternal factors like primiparas, history of consanguineous marriage and BMI also contribute as causative factors^{3,9}. Additionally, the environmental factors as nutritional excesses or deficiencies (e.g. folic acid), maternal illness or infection (e.g. diabetes, rubella), drugs taken during pregnancy (e.g. thalidomide), chemical

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exposure in the workplace or home (e.g., to solvents or pesticides) and radiation (e.g., medical X-ray) are also counted as associated risk factors of congenital anomalies^{1,10,11}. Considering the impact of these malformations on overall infant mortality particularly in developing countries¹² like Pakistan, it is important to decrease their incidence by identifying all potential risk factors and adopting optimum preventive measures.

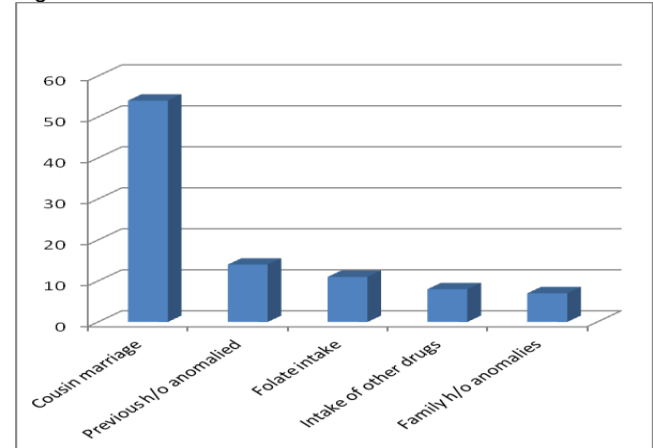
MATERIALS AND METHODS

This prospective observational study was conducted in the Obstetric unit of Govt. Lady Aitchison Hospital, Lahore on 80 infants who were admitted through emergency unit & out patients department. Patients' demographic record including age, parity, education, socioeconomic status, along with mode of admission, antenatal care status, previous scar (Myomectomy, Cesarean, D&C), Hysterectomy, Blood transfusion and duration of hospital stay was noted from patients record. All the relevant data was entered and analyzed through SPSS 16. All quantitative data was presented in form of mean \pm S. D. Qualitative variables were presented in form of frequency (%).

RESULTS

In this two years study (2010-2012), a total of 80 newborns with different anomalies were admitted in Lady Aitchison Hospital, Lahore. Among these 47(59%) were males whereas rest of 33(41%) were females. Out of these 80 newborns, 38(47%) had Hydrocephaly, 25(31%) had Anencephaly, 8(10%) had Arcania, 4(5%) had ompaloccele, 3(4%) had spina bifida and only 2 (3%) had Arnold Chiari. A total of 47 (59%) subjects out of 80 were compatible with life, among whom 38(81%) were hydrocephalus whereas only 4(9%) were ompaloccele, 3(6%) were spina bifida and 2(4%) were having Arnold Chiari. Majority of these deliveries 64(80%) were un-booked, that clearly indicates lack of awareness and attention towards this issue. The age of mothers of the subjects was ≤ 20 in 40(50%) of the patients, 21-30 years in 22(28%) and 31-45 years in 18(22%) patients. There were 14(18%) subjects, whose mothers had previous history of anomalies in other children as well while in 7(9%) subjects; there was a positive family history of these anomalies. The intake of folate was observed in only 11(14%) mothers and intake of other drugs was seen in 8 mothers. The history of Anti Epileptic drugs intake was also seen in 8 patients. Also, 54(67%) mothers were having cousin marriages.

Fig-I: Distribution of various risk factors



DISCUSSION

Congenital anomalies are quite complicated and pose serious physical, psychological and physiological influences. It is therefore the primary focus of investigators to successfully manage the children with such anomalies. For this purpose, however, expertise and knowledge of genetics, microbiology, reconstructive surgery and pediatrics is imperative¹³. Various genetic and maternal factors are mostly involved in contributing different types of anomalies, most commonly the NTD (Neural tube defect). Studies have shown that these congenital deformations and malformations account for more than 40% of deaths worldwide, and among these 75% are due to single gene defect¹⁴. Also, despite of high incidence of these anomalies, in developing Asian countries like Pakistan, the identification of risk factors, updated epidemiological figures and management measures are still not well recognized¹⁵.

Out of 80 newborns born with different anomalies during our study period, 47(59%) were males whereas rest of 33(41%) were females. Different types of anomalies present in these children were observed. The most common was Hydrocephaly present in 38(47%) newborns, while 25(31%) had Anencephaly, 8(10%) had Arcania, 4(5%) had ompaloccele, 3(4%) had spina bifida and only 2(3%) had Arnold Chiari. Hence, the musculoskeletal and nervous system was most commonly effected systems, quite similar to another international study. In that study the most frequently affected systems were cardiac (37.6%), musculoskeletal (14.7%) and central nervous systems (9.8%) and anomalies involving multiple organ systems (16%)¹⁶. However, another study showed more prevalence of cardiovascular and clubfoot anomalies to be more common in their setting and inclusion criteria¹⁷.

Also, maternal factors are unavoidably important in development of congenital anomalies¹⁴. Studies showed a number of maternal factors that could possibly be involved in these malformations. One study indicated that increasing maternal age, specifically 35 years or older and intake of drugs and smoking significantly contributes in occurrence of these anomalies¹⁸. Additionally, maternal obesity, stress, poor socio economic status and diabetes are crucial maternal factors that significantly increase the risk of these malformations^{2,5,9,19,20}. In our study, the age of mothers of the subjects was ≤ 20 in 40(50%) of the patients, 21-30 years in 22(28%) and 31-45 years in 18(22%) patients. There were 14(18%) subjects, whose mothers had previous history of anomalies in other children as well while in 7(9%) subjects; there was a positive family history of these anomalies. The intake of folate was observed in only 11(14%) mothers and intake of other drugs was seen in 8 mothers. The history of Anti Epileptic drugs intake was also seen in 8 patients. Also, 54(67%) mothers were having cousin marriages. The survival in 47(59%) subjects out of 80 was seen in our study, among whom 38(81%) were hydrocephalus whereas only 4(9%) were omphalocele, 3(6%) were spina bifida and 2(4%) were having Arnold Chiari. A large population based study investigated the survival rate of children with anomalies in data from in UK Northern Congenital Abnormality Survey (NorCAS) for a time span of 1985-2003. In this study, 20-year survival was found to be 85.5% in newborns born with minimum of one congenital anomaly, 89.5% in newborns of cardiovascular system anomalies, 79.1% in chromosomal anomalies, 93.2% in urinary system anomalies, 83.2% for digestive system anomalies, 97.6% for orofacial clefts and 66.2% for nervous system anomalies. The study also showed that the survival varied between subtypes within same congenital anomalies group²¹.

CONCLUSION

The hydrocephaly, anencephaly, arcania, omphalocele, spina bifida and arnolad chiari were most commonly observed types of anomalies in our study. Young maternal age, cousin marriages, intake of drugs, previous baby and family history of anomalies and lack of maternal care were major identified risk factors.

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