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Review Article

Rate, Pattern and Outcome of Congenital Malformed Babies at Omdurman Maternity Hospital in Sudan

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Abstract

Background

Major congenital anomalies can lead to fetal mortality; furthermore, they are a significant cause of infant morbidity and mortality. Majority of deaths due to congenital anomalies occur during the first year of life

Objective

The overall aim was to study rate, pattern and outcome of congenital malformed babies delivered at Omdurman Maternity Hospital in Sudan.

Methodology

It was cross-sectional, hospital based and total coverage study conducted in Omdurman Maternity Hospital in Sudan, during six months (January 2014 to June 2014). A total of 190 babies born with clinically detectable congenital anomalies during the period of study were included.

Results

The rate of congenital malformation reported in this study is 1.1% (190/17373). The number of congenital anomalies were more in females (F: M = 2.1:1.0). The pattern of congenital anomalies included musculoskeletal (39.0%), central nervous system (CNS) (30.0%), skin (5.0%) and multiple system defects (26.0%). In musculoskeletal group, polydactyl was most common malformation followed by spina bifida. In CNS group, meningeocele was the most common malformation followed by hydrocephalus and anencephaly. Frequency of congenital anomalies were more common in vaginally delivered babies as compared to cesarean born (68.4% vs. 31.6%) and in live born as compared to still born babies (73.0% vs. 27.0%).

Conclusion

The present study highlighted high rate congenital anomalies and showed that polydactyl defect is identified as major musculoskeletal congenital abnormality and meningeocele as major CNS congenital abnormality in this community.

Keywords: Rate; Pattern; Outcome; Congenital Malformation

Introduction

Congenital anomalies are developmental disorders present at birth. The prevalence and pattern of congenital anomalies varies between regions and may also vary over time. The most common body systems involved in congenital anomalies include musculoskeletal, central nervous system, gastro intestinal system and cardiovascular system with the least affected system being the urogenital system [1-4].

Worldwide, the incidence of congenital anomalies is estimated at 3-7%, but actual numbers vary widely between countries [5]. In the United States and Canada where congenital anomalies are diagnosed intra uterine and aborted, the incidence was 2-5% of all live births [6,7]. In Asia, the magnitude of congenital anomalies varies also with reported incidence of 2.5% of infants at birth in India [8]. In Africa, results from different studies vary on the frequency of congenital anomalies. The rate of congenital anomalies was found to be 20/1000 among children aged 0-18 years by a study done in Egypt [9]. Studies from East Africa reported incidences of above 2 20/1000 live births, while the incidence of major anomalies was found to be 15/1000 births [1,2]. The cause of up to 60% of congenital anomalies in humans is still unknown. For 20-25% of anomalies there seems to be a "multifactorial" cause, whereby there is a complex interaction of genetic with environmental risk factors. Another 10-13% of anomalies have a purely environmental cause (e.g. infections, illness, or drug abuse in the mother). Only 12-25% of anomalies have a purely genetic cause. Of those caused by genetic factors, the majority are chromosomal anomalies. Various environmental factors have been identified to be risk factors for congenital anomalies. Among the risk factors are advanced maternal and paternal ages, parental consanguinity, teratogenic agents, such as infectious agents and drugs, and nutritional deficiencies [10]. Rubella, cytomegalovirus, varicella and toxoplasma are infectious agents that can be transmitted to the fetus and cause adverse effects. Although different studies have been undertaken in different parts of the worlds but no such study has been undertaken in Khartoum state to best of our knowledge. The aim of this study is to study rate, pattern and outcome of congenital malformed babies delivered at Omdurman Maternity Hospital in Sudan.

Materials and Methods

It was cross-sectional, hospital based and total coverage study conducted in Omdurman Maternity Hospital, Sudan, during six months (January 2014 to June 2014). A total of 190 babies born with clinically detectable congenital anomalies during the period of study were included. Both mother and the baby were examined as a unit within 24 hours of birth and were further followed up to 72 hours. A detailed history was taken including all familial and gestational factors and a meticulous examination of baby was done. The inquiries were recorded by pre designed questionnaire. Data were collected by direct interview using structured data collection sheet well designed for this purpose.

Variables that were recorded include maternal age, social, educational status of mother, duration of gestation, parity, booking status, presence of risk factors including cousin marriage (first or second degree cousin), history of congenital anomalies, maternal medical disorders like diabetes, thyroid, and epilepsy, exposure of mother to viral infections in early part of pregnancy (flue like symptoms and fever), and maternal exposure to any drugs. Outcome of fatal anomalies were determined in terms of mode of delivery, and female to male ratio.

The data was analyzed by using Statistical Package of Social Science (SPSS). Obtained results presented in tables. The confidence interval of 95% and the P. value equal to 0.05 was used in this study. Mean, median and mode was used to explain demographic variables.

Ethical clearance and approval for conducting this research was obtained from the general manager of the hospital and informed written consent was obtained from every respondent who agreed to participate in the study. Of course, the respondents were informed that the study is not associated with any experimental or therapeutic intervention while information was collected from them.

Results

During this six month study, there were 17373 deliveries. Out of 17373 newborns, 190 had one or other congenital anomaly accounting to an incidence of 1.1% 190/17373. Out of these, 140 had single congenital anomaly and rest 50 had multiple malformations. The mean age for maternal age was 33+ 2.2 years**,** mean age for paternal was 38+ 3.1 years, mean gestational age at delivery is 37 weeks (SD+/- 2.41) and means birth weight of 3.16 kg (SD +/- 0.82). Almost 70% (133) of women were multiparous while 26% (49) were grandmultiparous and only 4% were primgravidas. Half of the mothers 97 (51.1%) have education to secondary school level. Febrile illness during pregnancy as risk factor was seen in (32%) of mothers.

Among the study group, (71.6%) were free from medical disorders. Epilepsy was seen in 4 mothers (2.1%). With respect to the types of drugs noticed to be used during pregnancy among the study group specifically the anti- epileptic agents; the congenital malformation seen in four cases, one as musculoskeletal anomaly and three cases with neurological defects.

Table 1. Demographic characteristics and risk factors of patients with congenital malformations.

Variable	Frequency	Percentage
Maternal age		
<20 years	06	(03.2%)
20-29 years	55	(28.9%)
30-39years	114	(60.0%)
40 -45 and above years	15	(07.9%)
Total	190	(100.0%)
Paternal age		
<20 years	03	(01.5%)
20-29 years	25	(13.2)
30-39years	104	(54.7%)
40 -45 and above years	58	(30.6%)
Total	190	(100.0)
Parity		
Primigravida	08	(04.2%)
Multipara	133	(70.0%)
Grandmultipara	49	(25.8%)
Total	190	(100.0%)
Education level		
No education	26	(13.7%)
Primary	45	(23.6%)
secondary	97	(51.1%)
University	22	(11.6%)
Total	190	(100.0%)
Antenatal care		
Yes	121	(63.6%)
No	69	(36.4)
Total	190	(100.0%)
Use of Antiepileptic drugs		
Yes	04	(02.1%)
No	186	(97.9%)
Total	190	(100.0%)
Consanguineous marriage		
Yes	83	(43.7%)
No	107	(56.3%)
Total	190	(100.0%)
History of congenital malformation		
Yes	37	(19.5%)
No	153	(80.5%)
Total	190	(100.0%)
History of chronic medical disorder		
Yes	54	(28.4%)
No	136	(71.6%)
Total	190	(100.0%)
History of febrile illness		
Yes	61	(32.1%)
No	129	(67.9%)
Total	190	(100.0%)

The pattern of congenital anomalies is shown in Table 2. The majority 74 (39%) of neonates with musculoskeletal anomalies, 57 (30%) with nervous system defects, 50 (26%) with multiple system defects, and 9 (5%) had skin lesions. In musculoskeletal group, polydactyl was most common malformation followed by spina bifida. In CNS group, meningeocele was

the most common malformation followed by hydrocephalus and anencephaly.

Regarding pregnancy outcome, out of the 190 cases 131 (68.9%) were delivered at term and alive, 11 (5.8%) were also at term but fresh still born babies and 4 cases (2.1%) were born macerated. Only 9 (4.7%) were delivered alive and preterm and alive, and 11 (5.8%) were preterm but fresh still born and 24 (12.6%) seen macerated at their preterm delivery. Frequency of congenital anomalies were more common in vaginally delivered babies as compared to cesarean born (68.4% vs. 31.6%) and in live born as compared to still born babies (73.0% vs. 27.0%) (Table 2).

Table 2. Pattern of congenital anomaly and pregnancy outcome of Patient with Congenital Malformation.

Variable	Frequency	Percentage
Pattern of congenital malformation		
Musk skeletal	74	(38.9%)
CNS	57	(30.1%)
Skin	09	(04.7%)
Multiple system	50	(26.3%)
Total	190	(100.0%)
Gestational age at delivery		
Term	146	(76.8%)
Preterm	44	(23.2%)
Total	190	(100.0%)
Mode of delivery		
vaginal	130	(68.4%)
cesarean section	60	(31.6%)
Total	190	(100.0%)
Gender		
Male	63	(33.2%)
Female	127	(66.8%)
Total	190	(100.0%)
Prenatal outcome		
Full term and alive	131	(68.9%)
Full term and fresh still birth	11	(05.8%)
Full term and macerated	04	(02.7%)
Pre-term and alive	09	(04.1%)
Pre-term and fresh still birth	11	(05.8%)
Pre-term and macerated	24	(12.7)
Total	190	(100.0%)
Birth weight		
<2.5 kg	42	(22.1%)
2.5 kg and more	148	(77.9%)
Total	190	(100.0%)

Discussion

The current study revealed that the incidence of congenital anomalies was 1.1%, Our results are in concordance with other studies [11-15], which showed that, the incidence varied from 1.2% to 1.81% in these studies. The patterns of congenital anomalies among the study are those apparently seen as musculoskeletal anomalies, nervous system defects and skin which typically like what seen in other studies from East Africa [1-3].

More over other numerous epidemiologic studies [11-15], have shown same finding that are along the same line as the current study. Additionally our result revealed that, in musculoskeletal group, polydactyl was most common malformation followed by spina bifida. In CNS group meningeocele was the most common malformation followed by hydrocephalus and anencephaly. The findings of the current study are correlate with previous studies [11,15]. To the contrary, Creasy and Alberman [16], performed a large study in London, a region with a fairly high neural tube defects (NTD) prevalence at birth, they estimated that the prevalence of NTDs (anencephaly or spina bifida) at 8 weeks' gestation (an estimate of true incidence) was 5.3 per 1,000 population. The concurrent prevalence of NTDs at birth was 2.8 per 1,000. The discrepancy between their study and our study may be explained by multiple factors, such as variation in prevalence by race, as well as a population difference or a difference in methodology of socioeconomic level and small sample size in the current study.

It was observed in the present study the congenital anomalies were more common in babies born to old mother (age

between 30-40 years) and again in mother aged 40 years and above. Similar observations were recorded in other studies also [11,17,18]. The congenital anomalies were seen more frequently in grandmultipara mothers who had parity of four and above which in our study was comparable to observations made by various authors[11]. Chaturvedi et al [19] recorded increase in frequency of CNS anomalies in primi and fourth gravida mothers.

General risk factors usually have a direct influence on pregnancy and delivery as for example medical and reproductive factors. Specific risk factors are those that we can call "causes behind the causes" through their indirect effects causing congenital malformation. They are mainly socio-demographic factors such as for example age, consanguinity and habits. An overlapping of these groups of factors could also occur as in the case of consanguinity. Consanguinity, which was found in almost 43% of study cases, is a socio- demographic indirect cause as well as a direct general risk factor. It increases the probability of congenital anomalies which in turn may associate with fetal death [13] . Consanguinity was noted in 83 parents out of 190 deliveries who had malformed babies. Also exposure to drugs was noted in four mothers who delivered congenital malformed babies. The offender drugs were antiepileptic. The effect of these factors is well documented in literature [13,14] .

Concerning the outcome of babies delivered with congenital anomalies in this study all have significant mortality and morbidity, the majority are alive at the time of assessment although with their major defect which may be fatal as most of the death occurred due to anomalies seen with in the first year of life our obtained result goes with what is reported in literature [6,10] , although our study is cross sectional one and lack of follow up limits the rest of detailed morbidity but still at the assessment the morbidity was proved. More over our study showed that stillbirth rate was 26.3%, 28 out of 50 were macerated and the remaining 22 out of 50 was fresh stillbirth. Prevalence of preterm delivery among the study group was 23.2%. Our finding is comparable with other studies [13,14] .

Conclusion

The present study highlighted high rate congenital anomalies and showed that polydactyl defect is identified as major musculoskeletal congenital abnormality and meningeocele as major CNS congenital abnormality in this community. The study definitely helps to know the pattern of congenital anomalies and to plan future strategies for prevention, early diagnosis and timely management.

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