Original Article

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Anatomy Section

Study of Incidence and Prevalence of Musculoskeletal Anomalies in a Tertiary Care Hospital of Eastern India

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ABSTRACT

Introduction: Congenital anomalies or malformations are anatomical. Structural or functional defects present at birth leads to physical and mental disabilities. With the advent of newer drugs, infectious diseases have taken the backseat and congenital defects have emerged as an important cause of neonatal morbidity and mortality. In India, anomalies of musculoskeletal system have been most commonly reported.

Aims and Objectives: With this in view, the present study was carried out to find the incidence and types of musculoskeletal defects in a tertiary care hospital in Eastern India. Various maternal factors were also correlated and analyzed. The purpose of this communication is to report these defects so as to help doctors and parents to prevent unexpected fetal loss and better parental counseling.

Materials and Methods: This study was done in the Department of Obstetrics and Gynaecology in association with Department of Paediatrics of a tertiary care hospital in Odisha from for a period of 1 year. The newborns were examined within 1st three days of delivery for congenital malformations. The study group included all live borns along with still borns after 28 weeks of gestation or those dead babies whose weight was about 1kg. A thorough physical examination from head to toe was done to look for musculoskeletal defects within 24hrs of delivery.

Observation and Results: Out of total 7268 babies delivered, 116 babies were found to have anomalies. Thirty two of these had musculoskeletal defects. Talipes equinovarus was the commonest anomaly observed followed by polydactyly. The ratio of male babies with musculoskeletal defects to female babies was found to be 1.28:1.The malformed babies were mainly born to term mothers (77.6%), who were mostly unbooked (62.5%) and belonged to lower or middle class. But no significant relationship could be established between these factors and defects. Most mothers were in the age group of 20-35 years and there was no history of drug addiction, smoking, trauma or irradiation that could be related to the occurrence of congenital malformations.

Conclusion: It is concluded that better maternal care and improved standards of living have very little effect on the overall frequency of congenital malformations. For the better future of neonates an early recognition of correctable lesions is essential, which calls for a systematic approach to the study of musculoskeletal defects.

Keywords: Congenital, Incidence, Musculoskeletal, Newborns

INTRODUCTION

Interest in congenital malformations goes back to the dawn of history. William Harvey made an attempt to look for causes of malformations and his studies lead him to believe that teratological phenomena resulted from disturbances of development.

Congenital malformations may be defined as abnormalities of structure present at birth and attributable to faulty development. Malformations occur due to complex interaction of genetic and environmental factors. Multifactorial inheritance is believed to underlie most common malformations.

Various teratogens when applied during intrauterine life may affect the developing fetus producing permanent postnatal damage, change in morphology or function. Such agents can be drugs like thalidomide, infections like rubella, radiations, chromosomal disorders and nutritional deficiencies.

These congenital defects have been associated with various maternal factors like maternal age, parity, antenatal illness and drugs. History of previous abortions, concomitant illness or of pre-eclampsia during the current pregnancy was more frequent in mothers who gave birth to malformed babies [1].

In India, interest in congenital malformations emerged in 60's when study on various congenital malformations was published from the data collected from several maternity hospitals in Mumbai, India [2]. Soon more and more studies were done in different parts of the country discussing different aspects of congenital malformations.

The incidence of entire spectrum of congenital malformations is approximately 2% of total births [3].

The incidence of individual malformations differs widely in different races of man but the total incidence appears to be similar in various races like Europeans, North American whites, and Japanese.

In most parts of India abnormalities of the musculoskeletal system were most commonly reported [4,5]. A study showing an incidence of musculoskeletal defects as high as 9.69/1000 was also reported.

With all this in view the present study was undertaken to evaluate the various musculoskeletal defects among newborns (both live and still borns) with the possible etiological factors and associated maternal factors if any in a tertiary care teaching hospital in Odisha,India.

This study was a trial to determine the overall incidence, types and distribution of various musculoskeletal defects both in live borns and still borns.

MATERIALS AND METHODS

The present study was done in the Department of Obstetrics and Gynaecology in association with Department of Paediatrics of a tertiary care hospital in Odisha, India from 1st July 2010, for a period of one year.

The newborns delivered during this period were examined within 1st three days of delivery for congenital malformations. The study group included all live births along with still births born after 28 weeks of gestation or those dead babies whose weight was about 1 kg. A thorough physical examination from head to toe was done within 24h of delivery. Those live borns, who had congenital defects, were again re-examined at the time of discharge if they survived.

In all cases a detailed maternal history relating to maternal age, socioeconomic status, and antenatal checkups, obstetric history, any history of congenital malformations, maternal illness during pregnancy etc. were taken.

All grossly visible musculoskeletal defects detected were recorded in a predesigned proformma. The clinical diagnosis was complemented by investigations as and when necessary.

The data was collected and tabulated. It was then statistically analyzed by using the chi-square test and probability test (ANOVA) [6]. The software used was MSTATC. The website referred was www.graphpad.com.

OBSERVATIONS

A total of 7268 babies were delivered during this period out of which 116 babies were found to have congenital malformations.

*An individual with multiple malformations has been entered more than once. While counting the total incidence, the individual has been counted once only.

Out of 116 babies showing various congenital malformations, 32 showed musculoskeletal defects. Among these 26 babies had only musculoskeletal defects which accounted for 22.4% cases of total malformed babies while [Table/Fig-1] 6 babies showed multisystemic involvement. Talipes equinovarus was the most common abnormality seen [Table/Fig-2] followed by polydactyly which was the second most common abnormality seen. Polydactyly [Table/Fig-3] was usually seen in babies with other associated defects. A baby with cleft lip and palate as principal malformation had polydactyly of left hand. One case each of cleft hand, cleft foot, myotonia congenita and absent pectoralis major was seen [Table/Fig-4].

As seen in [Table/Fig-5], the incidence of males with musculoskeletal defects was 56.25% while that of females was 43.75% ($p < 0.01$). So the male: female ratio was found to be 1.28:1.

The distribution of musculoskeletal defects according to gestational age is shown in [Table/Fig-6].

As seen from [Table/Fig-6], most malformed babies were born to mothers having term pregnancies (77.6%) and only 1.7% to post term mothers.

Most of the babies weighed between 2.1-3kg. Only 3 babies were low birth weight in the range 1.6-2kg.

MATERNAL FACTORS

[Table/Fig-7] shows maternal factors like antenatal checkup; follow up of pregnancy, education of the mother and their socio-economic condition.

The above observations clearly indicate that babies with musculoskeletal defects were born to un-booked mothers without any antenatal care (62.5 %) than booked mothers (37.5 %).

Also history of antenatal illness was obtained in some mothers. History of previous abortion was reported in 4 mothers, one had fever during 1st trimester, 2 mothers suffered from Antepartum Hemorrhage, two had hyperemesis gravidarum and one had Pregnancy Induced Hypertension.

Family history of congenital malformation was found only in one patient (3.125%). The baby was born with polydactyly of 5th finger attached with a skin tag. The baby's father also had the same at birth.

There was no history of drug addiction, smoking, trauma or irradiation that could be related to occurrence of congenital malformations.

[Table/Fig-8] shows that 68.75% mothers were in the age group of 20-35 years while only 12.5% cases were < 20 years of age.

Eighteen babies with musculoskeletal defects were born to primiparas, thus accounting for 56.25% cases.

In many cases medical and surgical intervention was done with successful results, but 2 babies died. One of them died during its hospital day due to extreme prematurity while another was born dead with anencephaly.

[Table/Fig-1]: Talipes equinovarus

Musculoskeletal System	32	Incidence/1000
Talipes equinovarus	15	2.0
Polydactyly	8	1.1
Osteogenesis imperfect	2	0.3
Absent pectoralis major	1	0.14
Syndactyly	3	0.4
Cleft hand	1	0.14
Cleft foot	1	0.14
Myotonia congenita	1	0.14

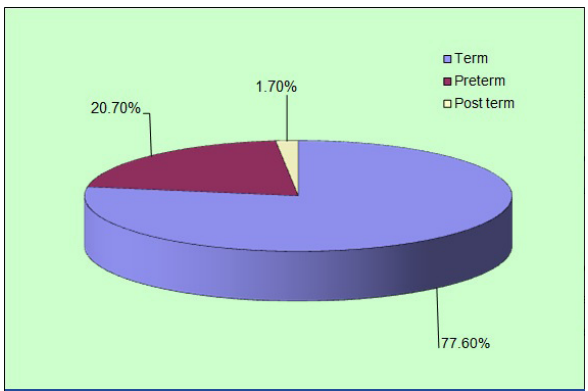
[Table/Fig-2]: Incidence of musculoskeletal defect/1000

[Table/Fig-3]: Polydactyly

[Table/Fig-4]: Absent pectoralis major

S.No.	Total cases	No	Percentage
1.	Male	18	56.25**
2	Female	14	43.75**

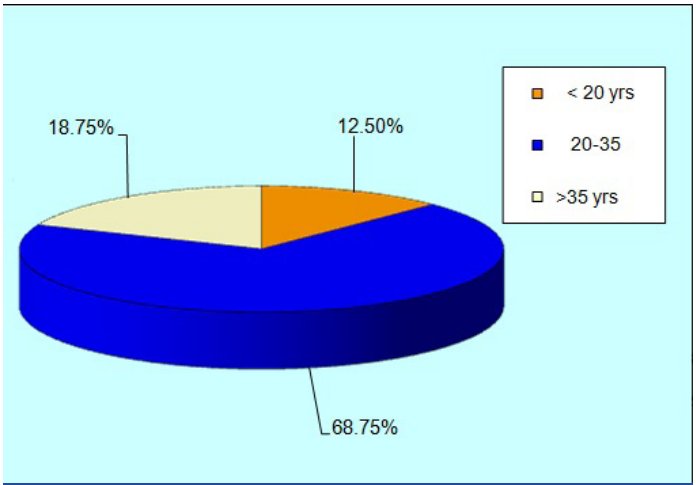
[Table/Fig-5]: No. of cases (male and female)



[Table/Fig-6]: Distribution of musculoskeletal defects according to gestational age

Sl No.			No.	(%)
1	**Booking Status**			
	Booked		12	37.5
	Not booked		20	62.5
2.	**Formal education**			
	Totally uneducated		10	31.25
	Educated	School	15	46.87
		College	7	21.88
3.	**Socio-economic condition***			
	Upper class		2	6.25
	Middle class		11	34.37
	Lower class		19	59.38

[Table/Fig-7]: Maternal factors. *p< 0.05



[Table/Fig-8]: Musculoskeletal defects according to maternal age

DISCUSSION

With better control of infections and nutritional deficiency diseases in developed countries, congenital malformations have emerged as an important cause of perinatal mortality, and would soon be an important determinant of perinatal mortality in India [7,8].

The present study revealed that the incidence of musculoskeletal defects is 4.4/1000 i.e. 0.44%. Musculoskeletal defects were the commonest in our study accounting for 22.4% of cases. In most parts of India abnormalities of musculoskeletal system are the commonest malformations as reported by many workers [9,10]. The incidence in different studies can vary depending upon the population sampled, selection of study material, and astuteness of clinician and availability of lab aids.

The commonest malformation of this system observed in present study was Talipes (15 cases) and polydactyly (8cases). In a WHO sponsored Global study the incidence of Talipes was found to vary from 3.42/1000 in Kolkata to 10.95/1000 in Panama City as reported by Stevenson et al., [11]. The main reason for this variation could be that in some hospitals, any malposition of feet was recorded as Talipes. Musculoskeletal defects top the list of malformations in most series perhaps because they are externally visible and hence readily identified at birth. They may at times be over diagnosed and merely represent postural constraints of fetus in utero.

Age of the mother didn't seem to influence the frequency of malformed babies. Similar findings have been reported by many other workers [12-14]. It was also observed that better maternal care and improved standards of living have very little effect on the overall frequency of congenital malformations [15,16].

CONCLUSION

This study helps us to know the various types of musculoskeletal defects observed in Eastern India and the various maternal factors in relation to these anomalies.

In an effort to analyse the causative factors of these defects it was found that in a majority of patients the cause remains obscure Early detection and proper management can help us to reduce the incidence of these defects. For this proper antenatal care and a high degree of awareness are essential.

Antenatal diagnosis by use of USG, amniotic fluid studies and restricted use of medication in early pregnancy play a significant role in reducing incidence of malformation.

A history of previous abortion, still birth or birth of a malformed baby should be a signal of caution for the physicians to look for malformations in early part of next pregnancy.

So to conclude, antenatal awareness of both parents and doctors is the only preventive measure to reduce the incidence of these malformations which constitute most important causes of morbidity and mortality in neonatal period.

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