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Study of Various Types Congenital Anomalies of Hand

Bilodi A.K.S.¹ and Gangadhar M. R.²

1 Department of Anatomy, Velammal Medical College Hospital and Research Institute, Tamilnadu, India

2 Department of Anthropology, University of Mysore, Karnataka, India

*Corresponding Author: Bilodi A.K.S.

Abstract

The present study is aimed at studying the various types, patterns and their percentages of incidences of anomalies of hand and associated with any other anomalies in district of Bangalore. A four years study was done in Bangalore district Bangalore. from 2007—2011. This four years study was done on 1257 males 743 females of human hands for the presence of any anomalies. Out of them, only forty subjects had anomalies of hand ranging from new born to adult age group. Each case, a detailed history of family, personal history past history of drug intake in first trimester associated with any other anomalies were taken. Later relevant investigations were done for those subjects who had anomalies of hand. Then were grouped and photographed. The subjects were classified into 5 groups as follows: Group-1, -Those subjects who had extra digits not involving the thumb (37.5%)--Post axial type polydactyly. Group-2, Those subject who had involvement of thumb (30.00%)...Preaxial type polydactyly. Group-3, Those subjects who had fusion of digits (27.5%),....Syndactyly. Group-4, Those subjects massive enlargement of thumb only (2.5%)...Macroductyly. Group-5, Those subjects who had absence of fingers associated without shortening of limb. Most of the anomalies can be corrected surgically except those in cases of macroductyly and absence of fingers. Hence this study gives us knowledge of various types of anomalies hand not only to the Anatomists but also to plastic surgeons and to orthopedicians. Hence it has been studied and reported.

Key words : Supernumerary, Syndactyly, bifid thumb, polydactyly megadactyly, Phocomelia -extra digits

Introduction

The objective of present study is to know the various types of anomalies of hands and their percentages of incidences that came across in the four years study in Karnataka district. The intrauterine development of extremities is strongly susceptible to teratogens during 4th to 7th week of Intra Uterine life and susceptible to lesser extent during 8th week of intra uterine life. It is during 4th to 7th week of Intra Uterine life developmental abnormalities of limbs like digital anomalies are likely to occur¹. Polydactyly is a common congenital anomaly of hand and foot is characterized by presence of more than five digits. They may occur as an isolated anomalies or may be associated with any syndrome due to genetical disorder. The condition may be autosomal recessive or autosomal dominant². There may be fusion adjoining digits. This condition is known as syndactyly or there may be development of abnormally large digits known as Macroductyly¹.

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Syndactyly may be fusion of any of the following digital combination i.e.,; thumb and index, index and middle, middle and ring ,ring and little fingers.Macroductyly is characterized by enlargement of any digits which are larger and longer than normal length If it is present it may come in way of performing vital functions like writing or lifting or holding any objects.

Materials and Methods

A outpatient based study was done in hospitals of Bangalore district, Bangalore. from 2007—2011 in 1257 males 743 females for the presence of anomalies of hands .Out of them, only forty subjects had anomalies ranging from new born to adult age group. In each case, a detailed history of family, personal history, any history of systemic diseases like diabetes, past history of drug intake in first trimester, any history consanguinity associated with other anomalies were taken..Later relevant investigations were done for those subjects who had anomalies of hand.Then were grouped and photographed.

Observations/ Results

The subjects were classified into 5 groups as follows.,

Group-1,-Those subjects who had extra digits not involving the thumb(37.5%).- Out of them, two subjects had bilateral and rest were unilateral .All were observed on the ulnar side.. **Post axial type polydactyly.**

Group-2,Those subject who had involvement of thumb(30.00%). Three cases were bilateral and nine unilateral... **Pre axial type of polydactyly**

Group-3,Those subjects who had fusion of digits(27.5%) commonly seen in the upper limbs . All the cases were observed in new born—Syndactyly.

Group-4,Those subjects massive enlargement of thumb only (Macroductyly –2.5% .Seen in only one case in a male aged **13 years in the right** side who had thumb but He had difficulty in writing as well as to hold any object

Group-5,Those subjects who had absence of fingers associated with shortening of limb-2.5% This anomaly was seen in boy aged 13 years who had absence index fingers on the right side . no shortening of limbs.

The above anomalies were seen predominantly seen in males (76.00%)

Observations were done on mothers of babies having anomalous hand (**Table 1**).Regarding mothers of anomalous subjects the following were noted:

1. There were mothers suffering systemic diseases like hypertension(20.00%), diabetes(17.50%).
2. There were mothers with bad obstetrics like hydramnios(07.50%) ,repeated abortions(05.00%), but there were no mothers with past history of still births .
3. There were 10 couples with second degree consanguinity (married to their uncle)-- 25.00%.
4. There were mothers with associated conditions like congenital like shortening of upper limbs,kyphosis,scoliosis(7.5%).
- 5) There were mothers who had history anomalies running in the family.(5.0%).

Discussion

There are 5 types of polydactyly have been described, they are as, Type 1, -Cutaneous Nubbin, Type 2, Pedunculated digit, Type 3, Type 4-Fully developed digit, articulating digit with 5th metacarpal bone, Type 5-Polysyndactyly³ There were case of syndactyly seen in new born children.⁴ In the patients with Hydroitic ectodermic dysplasia nails, teeth hair may be affected along with congenital malformation of heart, these cases are associated with polydactyly are also seen⁵ All were normal Bilateral post axial polydactyly of both hands and foot are found in families of consanguineous. This is seen in Joubert syndrome which is autosomal recessive.⁶ It has been reported in the literature that postaxial polydactyly seen in familial cases of congenital muscular torticollis⁷.

For the development of limb Lmbr 1 gene is very essential. Any change can lead to decrease or increase in number of digits in the vertebrate limbs In mice loss of digits was observed due to reduced activity of Lmbr1 gene. On the other hand increase number of digits was: observed in Hx mice and in human polydactyly patients.⁸ Polydactyly is one of the important feature of Pallister hall syndrome associated with other anomalies like imperforate anus, dysplastic nails, insertional hexadactyly of left hand and two Y shaped metacarpal with 6 fingers in the Right hand⁹. In families of consanguineous couples a rare anomaly was observed where in there is hydrocephalus, post axial polydactyly of both hand and foot along with both bilateral cleft lip of cleft palate¹⁰. In my previous study a case of shortening of right upper limb associated with drooping of shoulder and absence of index and middle finger has been reported in a 12 years old boy from Bangalore He had no other anomaly¹¹

There was a case of bilateral hexadactyly seen in all four limbs seen in a elderly male aged 60 years accidentally noticed by me in Bangalore district.¹²

Present Study : Present study has shown five types of anomalies of hand in the forty subjects ranging from new born to adult age group They were predominantly observed in males (76.00%) and only 24.00% were seen in females

There cases of **polydactyly** not involving thumb were seen in 37.5% of cases, extra digits of thumb including **bifid thumb were** observed in 30%, fusion of middle and ring fingers, massive enlargement of thumb and index fingers was found in male -**Macroductyly** -(2.5%), **absence of** middle and index fingers on the right side were detected in 2.5% of cases. There were associated findings like shortening of limb, kyphosis, scoliosis. There were two cases (5.0%) who gave history of anomalies running in the families(5.00%).

There were no cases of i) Joubert syndrome, ii) Pallister hall syndrome, iii) congenital muscular torticollis, iv) Polysyndactyly, v) Hydroitic ectodermic dysplasia, vi) Acrosyndactyly, vii) Poland Syndrome, viii) Apert Syndrome who had associated anomalies of the hand.

Present study has shown five types of anomalies of hand in the forty subjects ranging from new born to adult age group. Anomalies of hand were predominantly observed in males (76.00%) and only 24.00% were seen in females. Most of the cases were seen below the age of fifteen years(65.5%) Only three cases were associated with other anomalies like anomalies of foot, facial anomalies. One case was associated with Down syndrome in male child. There were ten cases(25.00%) of anomalies were born to consanguineous couples Systemic diseases 7 cases

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mothers were having diabetes(17.5%) ,eight mothers were hypertensive(20.00%) five mothers had bad obstetrics history of repeated abortions, hydramnios ,and still births (12.5%) .There were two cases (5.0%) who gave history of anomalies running in the families(5.00%) There were no cases of i)Joubert syndrome , ii)Pallister hall syndrome, iii)congenital muscular torticollis, iv)Polysyndactyly, v)Hydroitic ectodermic dysplasia, vi)Acrosyndactyly ,vii)Poland Syndrome, viii)Apert Syndrome.

Conclusion

This study has shown various types of anomalies of hand .This may be due to genetic or chromosomal disorder which has come in the way of development of limbs.The other causes may be consanguinity,hydramnios,repeated abortion ,systemic disease running in the family .

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Tables

Table 1: Various Percentages of Incidences of Systemic Diseases, Bad Obstetric History, Repeated Abortions, and Consanguinity.

S/NO	Condition seen in mothers of children having anomalous hands	Numbers	Percentages (%)
1	Hypertensive mothers	Eight	20.00%
2	Diabetic mothers	Seven	17.50%
3	Hydramnios	Three	07.50%
4	Repeated Abortions	Two	05.00%
5	Anomalies running in the families	Two	05.00%
6	consanguineous couples	Ten	25.00%
7	Associated Anomalies	Three	07.50%