

Original Research Article

Magnitude and pattern of birth defect babies at Bhopal district early intervention center under RBSK's 4Ds approach: an observational study

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ABSTRACT

Background: As per World Health Organization (WHO) congenital anomalies are also known as birth defects, congenital disorders or congenital malformations. Most common and severe congenital anomalies are congenital heart diseases, neural tube defect and Down's syndrome. No data on the magnitude of congenital anomalies is available in India. Thus, the study aims to determine the magnitude and pattern of babies with birth defect reporting at District Early Intervention Center, Bhopal in children aged 0 to 6 years.

Methods: This was an observational study conducted at DEIC, Bhopal under Rashtriya Bal Swasthya Karyakram services, over a period of one year. Children between 0 to 6 years visiting the center and belonging to Bhopal district were included in the study. Data entry was by Microsoft Excel and analysis was by Epi info.

Results: 2891 children were registered for the study out of affected children 18.7% of them were diagnosed with Developmental delays while birth defect was observed in 4.3% cases. Of the birth defect cases majority i.e. 37.7% had congenital heart disease and 16.7% had congenital hearing loss. No case of retinopathy of prematurity was registered.

Conclusions: The study also helps to know the magnitude and pattern of congenital anomalies. Any effective health intervention will reduce both direct costs and out-of-pocket expenditure.

Keywords: Congenital anomalies, Congenital heart disease, District early intervention center, Down's syndrome, Neural tube defect, Rashtriya Bal Swasthya Karyakram

INTRODUCTION

Congenital anomalies can be defined as structural or functional anomalies (e.g. metabolic disorders) that occur during intrauterine life and can be identified prenatally, at birth or later in life.¹ As per World Health Organization (WHO) congenital anomalies are also known as birth defects, congenital disorders or congenital malformations.¹ As per 2011 Census of India, there were 7,862,921 children with disability below 19 years age group.² Most common and severe congenital anomalies

are CHDs, NTDs and DS.³ Few other known birth defects are cleft lip, cleft palate, autism, muscular dystrophy, etc.⁴ While defects such as cleft foot and hand, club foot, aglossia and albinism, etc. are some of the rare types.⁴

Rashtriya Bal Swasthya Karyakram (RBSK) is an important initiative aiming at early identification and early intervention of selected health conditions for children from birth to 18 years to cover 4 'D's viz. defects at birth, deficiencies, diseases, development delays including disability through trained mobile health

teams and follow-up through District Early Intervention Centers (DEICs) which act as referral linkages.⁵ Under RBSK, child screening is at two levels community level and facility level.⁵

No data on the magnitude of congenital anomalies is available in India, thus lacking a National birth defects surveillance system.⁶ There is a requirement of systematic data on the magnitude of congenital anomalies, the most prevalent types of congenital anomalies, their healthcare impact and their impact on neonatal health.^{5,6} The Health Ministry in 1990, initiated the live births information system (SINASC), with the goal of gathering information relative to the births that have taken place in all national territory, which allows for the completion of more detailed epidemiological studies.⁷ Birth Defects Registry of India (BDRI) was appointed in 2001 by Foetal Care Research Foundation to document incidences of congenital abnormalities in the country.^{6,8}

Thus, the study aims to determine the magnitude and pattern of babies with birth defect reporting at District Early Intervention Center, Bhopal in children aged 0 to 6 years.

METHODS

Permission was taken from the institutional ethical committee of Gandhi medical college, Bhopal and from the concerned authority at DEIC, Bhopal.

The present study was conducted at DEIC, Bhopal, also known as Samarpan Kendra associated with Jai Prakash District Hospital, Bhopal, which acts a referral centre catering to the needs of people from different strata of society. This was a facility based observational study where all children between 0 to 6 years of age reporting for checkup for the first time at DEIC, Bhopal during the period of one-year duration (June 2018 to May 2019) were included. Two days a week were selected randomly for data collection during OPD timings at the center. A total of 2891 children got registered for the study of which 124 cases belonged to first “D” (i.e. Birth defect) under the 4 Ds approach. Those birth defect cases visiting for follow-up treatment and cases out of Bhopal district were excluded from the study. Outcome of the condition was based solely on diagnosis made by the doctor at the center.

Statistical analysis

Finally, data was entered into MS excel 2007 and analysis was done with the help of Epi info Version 7.2.2.2.

RESULTS

A total of 2891 children between 0 to 6 years of age reported at the center during study period.

Table 1: Distribution of children reporting at DEIC according to the proportion of defects in comparison with others health conditions.

“D” involved	Number (N)	%
Birth defect	124	4.3
Developmental delays	540	18.7
Deficiencies	342	11.8
Diseases and disorders	348	12.0
Children without any abnormality	1537	53.2
Total	2891	100.0

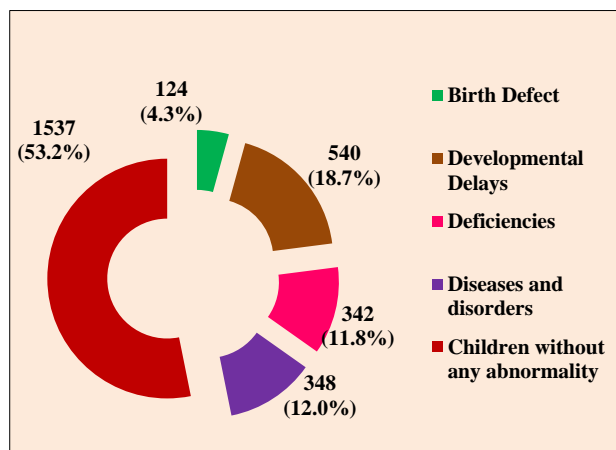


Figure 1: Proportion of birth defect cases among 4D's.

Table 2: Distribution of study participants according to the type of birth defect.

Variable	Number (N)*	% of responses
Neural tube defect	7	5.1
Down's syndrome	19	13.8
Cleft lip/ palate	14	10.1
Club foot	15	10.9
DDH	2	1.4
Congenital cataract	2	1.4
Congenital deafness	23	16.7
Congenital heart disease	52	37.7
Retinopathy of prematurity	0	0.0
Others	4	2.9
Total	138	100

*Multiple responses.

Table 1 depicts the distribution of children (aged 6 years and below) reporting at DEIC according to the proportion of birth defect in comparison with others health conditions. Majority i.e. 53.2% of children were free from any “D” mentioned under RBSK list, thus were either sent home or recalled for regular follow-up (in case of any suspicion). Followed by 18.7% children with developmental delays, 12.0% with diseases and disorders and deficiencies were observed in only 11.8% of children.

Out of 2891 total children reported, only 4.3% (124/2891) were diagnosed with birth defect at the center (Figure 1).

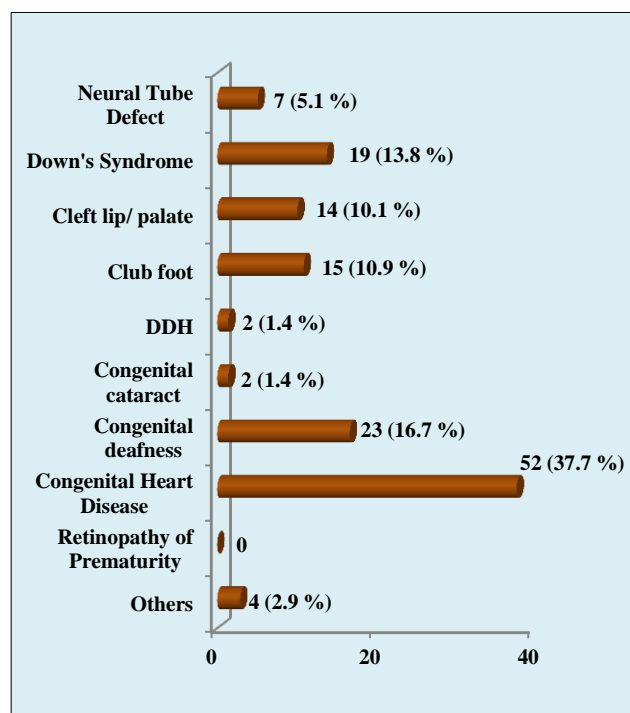


Figure 2: Distribution of study participants according to the type of birth defect.

Type-wise distribution of birth defect cases is displayed in Table 2. Out of 124 cases of birth defect, 138 responses were observed. CHD was reported in 37.7% of study participants with maximum magnitude, followed by 16.7% of congenital deafness, 13.8% of Down's syndrome, 10.9% of club foot and 10.1% of cleft lip/palate. While 5.1% cases reported with neural tube defect and; 1.4% were of developmental dysplasia of hip and congenital cataract each. No case of retinopathy of prematurity was registered under the study (Figure 2). There were 4 cases registered other than the list provided under RBSK namely right upper limb amelia, hypospadias and 2 cases of tongue-tied condition.

Those with multiple defects were 4 cases of Down's syndrome with CHD; 4 of Down's syndrome with club foot; 1 of CHD with congenital deafness; 1 of Down's syndrome with CHD with club foot; 1 of NTD with CHD with congenital deafness and 1 of club foot with DDH.

DISCUSSION

The present study was carried out for a period of one year i.e. June 2018 to May 2019. A total of 124 participants took part in the study.

The results of present study display that out of 2891 children reported, 4.3% (124/2891) were diagnosed with birth defect at the center. This is in contrast to the study in Panna district, Madhya Pradesh, India by Tiwari et al,

where a total 53 children had birth defects among 26977 screened children over the duration of 6 months of study, among 0 to 18 years.⁹ 0.38% of screened children between age 0 to 6 years presented with birth defect, 2.41% presented with deficiencies, 96.71% with diseases while 0.50% reported with delays and disabilities. On detailed interview with the respondents it was observed that there was lack of awareness regarding this center. Thus, mainly referred cases approached the center. Other conditions would have been treated at the respective pediatric OPD the patient approached. The irregular functioning of Mobile Health Teams may also be considered for this discrepancy, though it was not a part of the study.

In our study, NTD was presented by 5.1% of cases. NTDs constituted 9.78% of congenital anomalies in a study by Hossein et al.¹⁰ Also in a study by Tiwari et al, NTDs was present in 3.77% of children.⁹

In current study, DS was reported by 13.8% of cases. Hossein et al, concluded similar finding of 7.6% cases of Down's syndrome.¹⁰

A total 10.1% if the cases were of cleft lip/ palate in nature, as reported by our study. The findings were similar to study by Hossein et al, reporting 10.22% of cleft lip cases with/ without palate.¹⁰

Current study reveals club foot among 10.9% of malformed babies which was similar to a study done by Pattnaik et al, where congenital talipes equino varus (CTEV)/ club foot was found in 9% of children.¹¹

Present study reported 1.4% developmental dysplasia of hip (DDH) cases. In a similar study by Tiwari et al, no case of DDH was identified.⁹

According to present study, 1.4 % cases of congenital cataract were reported. In a similar study by Tiwari et al, no such case was identified under 6 years of age, while in children between 6 to 18 years, 5 cases (9.43%) were detected.⁹

Congenital deafness was observed in 16.7% among cases in current study. In a similar study by Tiwari et al, 7.55% of congenital hearing loss (CHL) was identified.⁹

A total 37.7% cases were reported as CHDs in our study. A study by Hossein et al, reported 20.44% of heart disease among CAs.¹⁰ In a similar study by Tiwari et al, a total of 69.81% of CHD positive cases were identified belonging to age less than 18 years of children.⁹ Out of them around 54.1% were aged less than 6 years. No case of retinopathy of prematurity (ROP) was observed during the study period. Similar finding was observed in a study by Tiwari et al, where also no such case was identified.⁹

A total of 124 cases of malformed babies were witnessed during the duration of one year. Similarly, a study by

Tiwari et al, revealed 53 cases of birth defects overall during 6 months of study period.⁹

Limitations of this study were a facility-based study thus cannot be applied to whole community. Also, data was collected only two days a week thus some children may be missed when approaching the facility other than the day of study.

CONCLUSION

The present study shows that the proportion of birth defects at DEIC, Bhopal was 4.3%. The study also helps to know the pattern of congenital anomalies. The study perceived that congenital heart disease, congenital hearing loss and Down's syndrome were the most common types of birth defects reporting at the center.

Any competent health intervention will reduce both direct costs and out-of-pocket expenditure. Continuum of care provided over different phases of the life of a child over the first 18 years, under RBSK services is a commendable feature of this programme thereby improving both survival and development of children.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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