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## Language Development of Children with Cleft Lip and Palate

Aarti Wanknis<sup>1</sup>, Rasika Karulkar<sup>2</sup>, Manik Limaye<sup>3</sup> & Dr. C. S. Vanaja<sup>4</sup>

<sup>1</sup>Associate Professor, Bharati Vidyapeeth University, School of Audiology & Speech language pathology, Dhankawadi, Pune.

<sup>2</sup>Private practice, Mumbai.

<sup>3</sup>Audiologist, Quadrio Labs Pvt Ltd, Pune.

<sup>4</sup>Professor & Head of Department, Bharati Vidyapeeth University, School of Audiology & Speech language pathology, Dhankawadi, Pune.

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### Abstract

Language deficits are known to be present in children with cleft lip and palate. However, equivocal results are present in the literature with some studies indicating a presence of predominantly expressive delay while others indicating a delay in both language comprehension and expression. The causes for the delay may be related to the cleft type/severity, associated syndromes, age & efficacy of palatal repair, hearing status & socio-linguistic status of the family among others. However, the relative contributions of these factors in the language delay are not in consensus. The present study was conducted to investigate the presence of language delay in children with cleft palate and to explore the probable factors contributing to the language delay. Language status of 60 children, with operated cleft palate with/ without lip, without any prior language intervention, in the range of 10 months to 60 months (mean age 29.6 months) was assessed on standard test - REELS (Receptive Expressive Emergent Language Scale) by interview method. Relevant history in terms of birth, surgical & medical history including middle ear conditions and language environment details were documented. 65% children had a significant language delay, out of which 53.84% children had a global language delay & 46.15% had expressive language delay only. Factors influencing the language development were explored & are discussed. Thus, children with cleft palate do exhibit significant language delays. More number of children had delays in comprehension and expression skills both than in expression only. Factors contributing to the language development in these children may vary depending on the type of the language delay.

**Keywords:** Language Delay, Expression, Reception, Global Language Delay.

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### Introduction

Children with cleft palate are considered at risk for delays in language development. Due to the heterogeneity in the population, research regarding language skills of children with cleft palate with or without lip show equivocal findings (Kuehn & Moller, 2000). Infants and toddlers with cleft palate with or without lip are at risk for decreased language skills when compared to their peers (Broen, Devers, Doyle, Prouty, & Moller, 1998; Chapman, Hardin-Jones and Halter, 2003; Jocelyn, Penko, & Rode, 1996; Neiman & Savage, 1997; Speltz, Endriga, Hill, Maris, Jones & Omnell, 2000). Differences in language skills between cleft and noncleft children have been noted in literature in terms of their vocabulary (Brennan & Cullinan, 1974; Nation, 1970) expressive language skills only (Chapman, Hardin-Jones, Schulte, & Halter, 2001; Neiman & Savage, 1997; Scherer & D'Antonio, 1995; Spriestersbach, Darley, & Morris, 1958; Sunitha, Jacob, Jacob, & Nagarajan, 2004; Young Purcell & Ballard,

2010) and overall receptive and expressive language skills (Broen, Devers, Doyle, Prouty, & Moller, 1998; Jocelyn, Penko, & Rode, 1996; Philips & Harrison, 1969; Scherer, D'Antonio, & Kalbfleisch, 1999; Smith & McWilliams, 1968). Further, studies do indicate that the initial delay is virtually eliminated by 4 years to 5 years of age (Chaudhary, 2011). On the other hand, some studies indicate that the language skills actually become more deficient with age (Philips & Harrison, 1969; Smith & Mc Williams, 1968). The probable causes of language problems in children with cleft palate discussed being lengthy hospitalizations (Nation, 1970), decreased exposure to language due to psychological impact of birth of a child with cleft in the family, frequent and fluctuating hearing loss that these children experience in the critical periods of language development, socioeconomic status among others. The present study was conducted with the aims to investigate the development in children with cleft lip and palate and to explore the probable factors contributing to the language delay.

### Correspondence

Aarti Wanknis

E-mail: aartiwanknis1@gmail.com, Ph. +9198231 34576

### Methodology

60 children in the age range of 10 months to 60 months (mean age of 29.6 months) with operated cleft lip

and palate participated in the study. None of the children had any known associated conditions which could affect the development of language like mental retardation, visual impairment, hearing impairment, and learning issues. None of the children had undergone any speech language therapy in the past, to prevent the effect of speech or language therapy on the language development. A detailed case history was taken from the parents that included demographic details, family history (medical, educational and occupational), birth history (pre natal, natal and post natal), medical and surgical history, and developmental history. Otoscopic examination and audiological assessment (Immittance evaluation) was conducted to determine the child's middle ear status. Further, language was assessed on standard test - Receptive Expressive Emergent Language Scale (Bzoch & League, 1971) by interviewing the primary caregiver, most of the times the child's mother. The responses were marked and language age (both receptive and expressive) was determined. The language age of the child was compared with the chronological

age and presence of delay was determined. A child was said to have a delay in language comprehension/ expression or both if the difference was more than 6 months. All the data was tabulated and analyzed.

## Results

A significant language delay (delay of > 6mths) was found to be present in 65% of the children (n=39) with cleft lip and palate. Out of these 53.84% (n=21) had a global language delay, whereas 46.15% (n=18) had a delay in language expression only. The range of global language delay varied from a minimum of 7 months in comprehension and 9 months in expression to 32 months in comprehension and 38 months in expression. The range of expressive delay was 7 to 24 months. The distribution of children who had normal language development, expressive delay and delay in both language comprehension and expression is given in Fig 1. The delay in language does seem to persist till 5 years of age in the children studied.

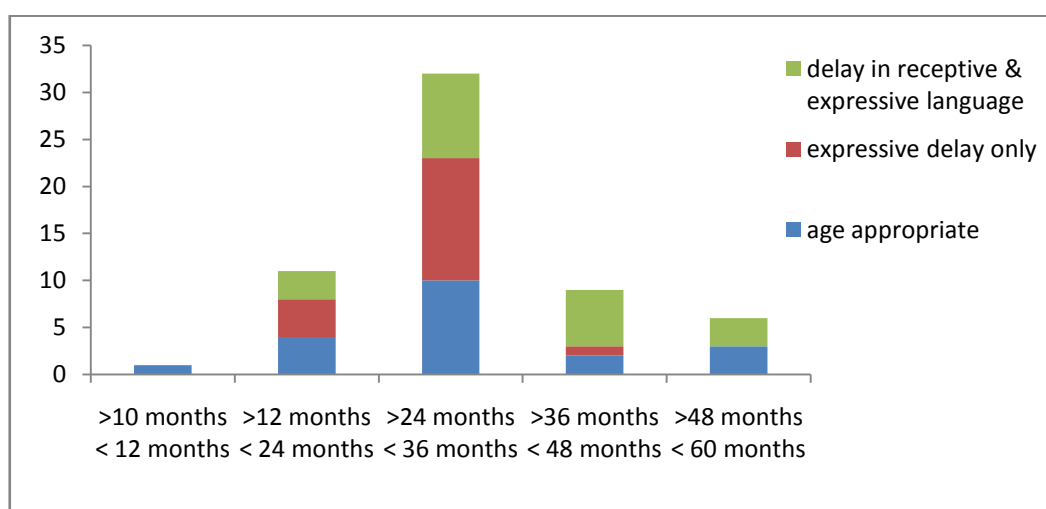


Figure 1

Graph describing distribution of children as per their language status across age groups.

The probable factors contributing to the language delay were explored using the statistical tool of Multinomial Logistic Analysis. The following factors were considered- type of cleft, middle ear status, age of palate surgery, maternal education, maternal working status, and significant post natal medical history. Analysis indicated that the full model significantly predicted the cause (Chi square = 32.853, df= 20,  $p=0.035$ ) wherein the model accounted for between 42.2 to 47.5% of variance in language delay. The factors were found to contribute to the language delay as a whole in varied proportions. The hierarchy was maternal working status ( $P=.060$ ), age of palatal surgery ( $P=.059$ ), significant postnatal medical history ( $P=.057$ ), type of cleft ( $P=0.536$ ), middle ear status ( $P=0.496$ ) and maternal education ( $P=0.286$ ). When the analysis was done to determine the factors contributing to the different

types of delays, it was found that the contribution of factors were different for global delay i.e delay in both receptive and expressive language as compared to when the delay was present in expressive language alone. The two main contributing factors for global language delay were age of palatal surgery ( $P=.050$ ) and maternal working status ( $P=.087$ ) and for delay in language expression were maternal education ( $P=.092$ ) and significant postnatal medical history ( $P=.088$ ).

## Discussion

The results of the study indicate that language delay is present in a high proportion of children with a cleft palate with/ without cleft lip in the age range of 10 months and 60 months. This is consistent with study done by Schonweiler, Schönweiler, and Schmelzeisen (1996) who found a high prevalence of language delay in

children with cleft lip & palate. Children with cleft lip and palate had more prevalence of global language delay which is consistent with findings of Smith & McWilliam (1968) & Philips & Harrison (1969). This global language delay appears to persist in the population more than the expressive language delay. However, a more exhaustive study on larger number of children across the age groups needs to be conducted for generalization of the findings. In addition, further studies need to be done on larger number of children per age group to study the delay as a function of age.

Wasserman, Allen and Linares (1988) has reported that interaction patterns between these children with cleft lip and palate and their parents is an important factor contributing for the delay in language development. In children with cleft lip and palate, both the quality and quantity of interaction is affected due to a number of factors such as frequent hospitalizations, psychosocial impact of having a cleft child, feeding and difficulties in early vocalizations for social communication with mother's etc. A number of researchers have reported that the interaction patterns between children with cleft lip and palate and their mothers is affected (Fields & Vega Lahr, 1984; Wasserman & Allen, 1985; Wasserman, Allen & Soloman, 1985; Wasserman, Allen & Linares, 1988). The problem could be further aggravated with working mothers due to the added stress and management of the child by multiple caretakers. This is consistent with the results of the present findings which indicate that the working status of mother contributes to the language delays more than the other factors studied. Same is found to be contributing to the presence of global language delay, after the age of palatal surgery.

Hardin- Jones and Jones (2005) have reported better speech outcomes with earlier palatal surgery. Researchers have considered early age of palatal surgery to be a factor leading to better speech outcome (Hardin-Jones & Jones, 2005; Rohrich & Gosman, 2004; Sandberg, Magee, & Denk, 2002; Kirschner, Randall, Wang, Jawad, Duran, Huang, Solot, Cohen, & LaRossa, 2000; Ysunza, Pamplona, Mendoza, Garcia Velasco, Aguilar & Guerrero, 1998). Current findings support the fact that children with age of palatal surgery greater than 1 year showed higher prevalence of language delay, as 12 children out of 13 who had palatal surgery after 1 year of age had language delay; out of these 8 children had global language delays.

The two highest contributing factors for the presence of expressive language delay in children were maternal education and significant post natal history. Maternal education is found to be an important factor contributing to the language achievement of children (Dollaghan, Campbell, Paradise, Feldman, Janosky, Pitcairn, & Kurs-Lasky, 1999; Magnuson, Sexton, Davis-Kean & Huston, 2009). The quality of language input provided by the mothers was found to increase with an increase in education resulting in better achievement levels in children. The same has been reflected in the

present study where the education of mothers ranging from lesser than college education to postgraduate was found to be the highest contributing factor for expressive language development in these children with cleft palate with/ without cleft lip. The language models provided by the mothers in terms of vocabulary and sentence length in addition to the speech elicitation devices used by them needs to be studied further in details. Not just the quality but also the quantity of language stimulation gets affected when there are health related issues seen in the children with cleft palate which may or may not be related to the cleft like pneumonia, febrile convulsions etc which put an additional burden of child care on the stimulating parents. They may also cause anxiety which is found to be related to the language achievements of the children (James, 2016).

Many studies have reported a relation between lower scores on language measures with hearing loss associated with frequent otitis media with effusion (OME) during the first years of life (Feagans, Sanyal, Henderson, Collier, & Appelbaum, 1987; Freil-Patti, & Finitzo, 1990; Jocelyn, Penko & Rode, 1996; Roberts, Burchinal, Medley, Zeisel, Mundy, Roush, Hooper, Bryant, & Henderson, 1995; Schonweiler, Schönweiler, & Schmelzeisen, 1996; Shriberg, Friel-Patti, Flipsen, & Brown, 2000). Contradictory studies have also been reported that show no such association between OME and language development (Gravel & Wallace, 1992; Paul, Lynn, & Lohr-Flanders, 1993; Roberts, Burchinal, Davis, Collier, & Hendrickson, 1991). The present study indicated that the presence of middle ear conditions were not strong contributors to language delay in the children included in the study.

## Conclusion

The study thus indicates that many children with cleft lip and palate do exhibit significant language delays; and more number of children have delays in comprehension and expression skills both, rather than in language expression only. The factors contributing to the language development in these children may vary, depending on the type of language delay.

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