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CLEFT PALATE AND EARLY INTERVENTION: BEGINNING THE TREATMENT PROCESS

By

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B.S., Southern Illinois University Carbondale, 2011

A Research Paper
Submitted in Partial Fulfillment of the Requirements for
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Children with cleft palate belong to a special population, due to the lack of anatomical development that has occurred in their oral cavity. These infants and toddlers typically require services from birth to facilitate adequate feeding, repair orofacial anomalies (Edmondson & Reinbartsen, 1998), dental structure (Rishita & Tate, 2009), hearing and Eustachian tube functions (Zanzi, Cherpillod, & Hohlfeld, 2002), as well as early intervention services to address speech or language delays that may have resulted from the cleft palate. This review is an attempt to address the above mentioned services and provide a basis to pursue research about the treatment process.

Typical Speech-Language Development

Before going into detail about delays, deficits, and definitions within cleft palate and intervention, it is important to lay out what is considered normal speech and language development and know the differences between typical and atypical development. From birth to 12 months of age, children are typically expected to develop a variety of milestones such as babbling with consonants and vowels, understanding words and phrases, pointing for requests, naming objects, people, and actions, negating, and requesting more with single words (Balasubrahmanyam, Scherer, Martin, & Michal, 1998). Between ages one and two, the sound repertoire increases, sentences are understood, and words are beginning to

be combined to form sentences (Balasubrahmanyam, et al., 1998). From age two to three years old, sound substitution begins, intelligibility increases to 75%, more words and concepts are understood, sentence forms expand, and engagement in conversation begins (Balasubrahmanyam, et al., 1998).

Cleft Palate: Definition, Types, and Occurrence

A cleft is defined as a separation of anatomical parts (Edmondson & Reinbartsen, 1998). For this review, focus is specifically the separation of the roof of the mouth, also known as the palate. The palate forms between six and eight weeks gestation, but if the palate does not form completely, a cleft occurs (Edmondson & Reinbartsen, 1998).

A cleft can be defined as a unilateral, bilateral, or submucous cleft. Submucous clefts occur when the cleft in the palate is covered by the lining of the roof of the mouth and may co-occur with a split uvula (Edmondson & Reinbartsen, 1998). Submucous cleft palates tend to be diagnosed later than typical clefts, at a mean age of five years (Reiter, Brosch, Wefel, & Haase, 2011). Submucous cleft palates are also characterized by hypernasal speech, Eustachian tube dysfunction with conductive hearing loss, and nasal reflux of meal and liquid (Reiter et al., 2011). Late diagnosis or lack of diagnosis may be caused by the submucous cleft variability in presentation and lack of awareness of the anomaly (Reiter et al., 2011). Children with

cleft palates may also have cleft lips. Like cleft palates, there are multiple types of cleft lips such as bilateral and unilateral cleft lips (Zanzi et al., 2002).

Syndromes may also accompany the occurrence of cleft palate, including the following: cerebro-costo-mandibular, diastrophic dysplagia, femoral hypoplasia-unusual face, Fryns, Hay-Wells, Larsen, oto-palato-digital, Stickler, Treacher Collins, DiGeorge, and Velo-Cardio-Facial syndrome (Balasubrahmanyam et al., 1998). Eighty percent of the listed syndromes are genetic in nature. About 60% of these eight genetic syndromes are dominant, while the other 40% are recessive (Balasubrahmanyam et al., 1998).

Recently, the Centers for Disease Control and Prevention (CDC) estimated that each year approximately 2,500 babies in the United States are born with a cleft palate (Centers for Disease Control & Prevention, n.d.). Isolated clefts, which occur with no other orofacial defects, are one of the most common birth abnormalities in the United States (Centers for Disease Control & Prevention, n.d.). Around 70% of cleft lip and cleft palates that occur are isolated clefts (Centers for Disease Control & Prevention, n.d).

Early Assessment

Because of recent advances in modern technology, particularly the implementation of fetal ultrasonagraphy, cleft

lip and palate has been able to be diagnosed prenatally (Martinez-Ten et al., 2012). In the past few years, the use of 3D ultrasound has allowed assessment of the secondary palate and increased the confident diagnosis of cleft palate in the second and third trimester of pregnancy (Martinez-Ten et al., 2012). A study conducted by Martinez et al. in 2012, showed that a large majority of orofacial clefts can be accurately detected and characterized in the first trimester of pregnancy using offline analysis of 3D ultrasound (Martinez-Ten et al., 2012). To properly understand the ability to assess and diagnose clefts through ultrasound, it is necessary to understand the developmental process of the palate and coordinating orofacial structures. The primary palate is the first to develop between four and eight weeks gestation and includes the upper lip, philtrum, alveolar ridge, and triangular area of the hard palate (Martinez-Ten et al., 2012). Between eight and ten weeks gestation, the posterior part of the palate forms, hence the term secondary palate (Martinez-Ten et al., 2012). Simultaneously, the hard palate together with the soft palate or velum is developed (Martinez-Ten et al., 2012) followed by many other complicated processes leading to the formation of the face. Difficulty in diagnosis occurs mainly due to the small size of these structures during the first trimester (Martinez-Ten et al., 2012). False-positives also can occur during the

diagnosis process proving that early prenatal diagnosis of cleft lip and palate has limitations (Martinez-Ten, et al., 2012). Martinez et al. (2012) recommend that a second trimester evaluation of the lip and palate be performed to officially determine whether the facial anomaly is present or not.

Speech-Language Pathologist's Role

Because feeding, hearing, speech, and language can be affected in children with cleft, the speech-language pathologist (SLP) should be involved in the child's development (Edmondson & Reinbartsen, 1998). The SLP who is a part of the cleft palate team must be educated on cleft palate to properly diagnose and treat clients, as well as attend meetings with other team members to discuss the client's treatment course and progress (Pannbacker, 2004). The SLP should also advocate for early assessment and monitoring of communication skills, focusing on language abilities and emerging sound production in infancy, before the child even begins to speak (Nagarajan, Savitha, & Subramaniyan, 2009).

As of 1993, ASHA regulations were altered and specific disorder courses were no longer required as a part of graduate education (Vallino, Lass, Burnell, & Pannbacker, 2008). For a lot of graduate programs, this meant removing courses in cleft palate, voice, or fluency for more generalized coursework (Vallino et al., 2008). A study conducted by Vallino et al.

(2008) concluded that students were not receiving the adequate amount of training while in graduate school to properly treat complex cleft palate cases. Clinicians must find alternative methods of education about cleft palate to guarantee that they are properly equipped to treat cleft palate clients. They must also be able to properly use instrumental evaluation in the form of endoscopy, pressure flow, or videofluoroscopy to assess velopharyngeal function as an essential part of the cleft palate team (Pannbacker, 2004).

Multidisciplinary Team

Team management is an important aspect of cleft palate treatment. Because of the effect that the anomaly may have on multiple structures in the oral cavity and surrounding structures, a dentist, orthodontist, primary physician, audiologist, and surgeon are important professionals to include on a team when managing cleft palate. The multidisciplinary approach benefits the patient, family, and cleft palate team with significant educational value as well, providing an opportunity for understanding the diagnosis and treatment considerations, including treatment options in multiple disciplines (Rishita & Tate, 2009). A list of craniofacial teams in the U.S is available at the American Cleft Palate–Craniofacial Association’s website.

Feeding Intervention

Feeding issues are common in children with cleft palate. This difficulty is caused by the cleft in the palate which causes a lack of closure between the oral and nasal cavity. The lack of closure does not allow enough negative pressure to form so the baby can suck when breast or bottle feeding (Edmondson & Reinbartsen, 1998). Infants with a palatal cleft were lighter at birth compared with the general population, and this was significant for those with isolated cleft palate as seen in a study by Beaumont (2008). The low birth weight combined with the difficulty to gain proper nutrition because of the cleft, may lead to failure to thrive and poor growth (Beaumont, 2008). This lack of nutritional gain could lead to additional developmental problems and should be addressed immediately.

Reid (2004) identified five broad interventions for feeding in children with cleft palate: feeding equipment, feeding techniques, breast-feeding, prostheses, and nutrition advice. Feeding equipment that had strong evidence of success were a compressible bottle and NUK orthodontic nipple with parental counseling, and Mead Johnson cleft palate feeder or a rigid bottle and crosscut nipple supplemented with a nutrition intervention protocol (Reid, 2004). Cup feeding was also found useful to complement breast-feeding (Reid, 2004). The ESSR

technique (enlargement, stimulate, swallow, rest) was noted as a positive feeding technique, along with upright positioning, assisted milk delivery system, controlling flow rate, and limiting feeding times to 20 minutes to decrease infant fatigue (Reid, 2004). Furthermore, breast-feeding complemented by palatal obturators to lengthen the palate was connected with an increase in the amount of milk consumed in a feeding (Reid, 2004). Obturators also fell under the prostheses category for feeding management. Moreover, nutrition advice was included in the intervention options investigated by Reid (2004) because of the support it offers not only for the child who has the cleft palate, but for the caregiver as well.

Surgical Repair

The purpose of surgical intervention is to increase the function of the palate for adequate speech and feeding. Palatal repair occurs when the child is 9-18 months old, according to Edmondson and Reinbartsen (1998). Primary palatal surgery before 12 months of age will assist in preventing over-production of glottal stops that many children with cleft palate use in place of multiple phonemes (Kuehn & Henne, 2003). Kuehn and Henne (2003) suggested that surgery should occur at an even earlier age, between nine and 12 months. Researchers reported that 10-20% of children undergoing primary palatoplasties around 18 months have associated velopharyngeal dysfunction (Nagarajan, et

al., 2009). It is assumed that the occurrence of velopharyngeal dysfunction is increased in children who undergo the surgery at older ages (Nagarajan et al., 2009).

Prior to surgery, families are encouraged to wean children off the bottle because usage of a cup for liquefied foods post-surgery is required (Edmondson & Reinbartsen, 1998). Second surgeries are sometimes needed when problems associated with the cleft palate continue to cause speech difficulties (Kuehn & Henne, 2003).

Dental Intervention

Pediatric dentistry plays a critical role in creating a proper plan of care for oral health and overall nutrition (Rishita & Tate, 2009). Dentists as members of the cleft palate team provide assistance to maintain healthy dentition and gums, monitor craniofacial growth and development, and correct jaw relationships and dental occlusion to achieve proper function and appearance (Rishita & Tate, 2009). Feeding appliances and presurgical infant orthopedic appliance impressions are most frequently provided by the pediatric dentist on cleft palate teams at most hospital-based programs (Rishita & Tate, 2009).

Hearing Intervention

Normal hearing is important for the acquisition of language, and speech results should be evaluated in the light of hearing results (Zanzi et al., 2002). Children with cleft

palates have a higher probability of otitis media and transitory hearing loss can be a severe problem (Zanzi et al., 2002). They typically benefit from early intervention and intensive hearing follow-ups (Zanzi et al., 2002). It is recommended that hearing results be reported with impedance tympanograms, and one and two ear audiograms to clarify the impact of the deficit on the child's living and learning conditions (Zanzi, et al., 2002).

Priester and Goorhuis-Brouwer (2008) pointed out that conductive hearing loss in approximately half of children with cleft palate occurs due to related velopharyngeal insufficiency. The Eustachian tube becomes less effective secondary to affected velopharyngeal muscle strength, increasing the possibility of persistent fluid in the middle ear (Priester & Goorhuis-Brouwer, 2008). The persistent middle ear fluid and secondary ear infections may cause hearing loss (Priester & Goorhuis-Brouwer, 2008).

Speech-Language Intervention

Addressing intervention for cleft palate begins by identifying the type of cleft the child has (Balasubrahmanyam et al., 1998). Balasubrahmanyam et al. (1998) pointed out that some children develop normally after surgical repair of the palate. Compensatory errors may remain post-surgery, due to altered articulation placement learned in response to the abnormal structure, requiring speech therapy for correction (Kummer,

2011). Additionally, it seems that children who had cleft lip and palate tend to lag in onset and progression of early expressive language (Balasubrahmanyam et al., 1998). Nagarajan et al. (2009) reviewed studies conducted on children with cleft lip and palate concluding that they exhibited delayed expressive language, evidenced by slow acquisition of sounds and words and lower inventory of sounds in early infancy. In their review, Balasubrahmanyam et al. (1998) also noted that children with cleft lip and palate proceeded to "catch up" over a period of time, and expressive language improved or continued to have mild, expressive language and speech delays. Children with isolated cleft palate were found to have more severe expressive language and speech delays, along with receptive language delays (Balasubrahmanyam et al., 1998). These studies demonstrated that extensive and severe physical impairments are not directly associated with speech and language impairment (Balasubrahmanyam et al., 1998).

When comparing pre-surgery differences in speech between babies with cleft palate and those without cleft palate, researchers noted that differences in babbling began around nine months of age (Chapman, 2004). Babies with cleft palates had reduced babbling ratios and some had yet to even reach the babbling stage at this age (Chapman, 2004). However, at six months of age, more similarities than differences were seen in

babies with and without cleft palate (Chapman, 2004). This evidence supports beliefs that babies with cleft palates will benefit from early surgery procedures. Phonetically, it has been evidenced that babies with cleft palate in the early vocalizations stages exhibit fewer oral stops, more glottal stops, glottal fricatives, glides, and nasals than non-cleft babies (Chapman, 2004). Phonetic speech intervention in cleft palate children emphasizes articulation through motor learning of proper placement, manner, and voicing (Pamplona, Ysunza, & Ramirez, 2004).

Phonological Approach

Investigators also looked into phonological issues that occurred post-surgery. Results showed that even though considerable speech gains were made post-surgery, pre-surgery error patterns that may have been related to early structural deficits were incorporated into the developing phonological system and in turn influenced phonological learning (Chapman, 2004). Phonological speech intervention approaches deficits with a focus on phonology or organization of sounds, not just complex articulatory patterns (Pamplona et al., 2004). In a study previously completed by Pamplona and Ysunza in 1999, children with cleft palate and compensatory articulation disorder secondary to velopharyngeal insufficiency were treated with either a phonetic approach or phonological approach (Pamplona et

al., 2004). Their results indicated that total speech intervention time was critically reduced when a phonological approach was used to correct the compensatory articulation disorder (Pamplona, et al., 2004). Due to faster treatment progress using the phonological approach and the integration of phonology and language, researchers suggested that children with cleft palate and compensatory articulation disorders should have their language assessed (Pamplona, et al., 2004). It has also been suggested that children who have difficulty learning phonology may have similar difficulties learning morphology, syntax, and semantics of language (Pamplona, et al., 2004). Pamplona, Ysunza, Gonzalez, Ramirez, & Patino (2000) studied the relationship between compensatory articulation disorder and the language system, finding that children with compensatory articulation disorders differ in their overall development of language from children with repaired cleft palates who did not have compensatory articulation patterns (Pamplona et al., 2000).

Research conducted by Pamplona et al. (2004) compared the outcomes of two different therapy methods addressing phonology and language. The first group received therapy with focus on establishing and maintaining new contrasts of sounds with a phonological approach (Pamplona et al., 2004). The second group received therapy according to Whole Language principles, primarily using play and story books. Whole Language principles

suggest that phonological information not be separated from other areas of language, i.e. pragmatics or syntax, including several pieces of information about all areas of language (Pamplona et al., 2004).

Each sound affected was treated indistinctly, by reinforcing correct speech sounds and enhancing cognitive organization (Pamplona et al., 2004). Results showed that the time for correcting compensatory articulation disorder was not reduced with the naturalistic Whole Language intervention. However, overall language performance improved dramatically from the initial assessment (Pamplona et al., 2004).

Parental Involvement

When playing and vocalizing with their babies with cleft palates, parents should be aware of these tendencies to produce certain sounds. Parents should reinforce stops that babies with clefts are trying to produce, but avoid growling or glottal stops (Hardin-Jones, Chapman, & Scherer, 2006). Because these sounds are easier vocalizations for babies with clefts, they tend not to resolve spontaneously. Parents should model appropriate vocalizations (Hardin-Jones et al., 2006). Parents' attendance to therapy sessions is also important to enhance their ability to properly communicate during interaction, enhance skills for providing reinforcements useful to therapy,

and encourage parents to provide this reinforcement at home whenever possible (Pamplona, et al., 2004).

Play-Based Assessment and Therapy

Past studies by Snyder and Scherer (2004) have also shown that children with cleft palate may show increased difficulty with symbolic play which influences language development. Snyder and Scherer (2004) found that SLPs may be able to make a prognosis for language development by using play-based assessments during evaluation with children with cleft palates. Play gestures and speech-language used during play should be noted to aid in evaluating the developmental delay. Snyder and Scherer (2004) found that a play-based assessment model was especially helpful to distinguish speech-language delays in children with isolated cleft palates. Play-based assessments occur in an environment that is familiar to the child to assess spontaneous language produced during play (Snyder & Scherer, 2004). Single and multi-scheme levels of play were assessed by Scherer and Snyder (2004). The single-scheme level consisted of demonstrations of single-object relationships in play, both with and without an object, such as pretending to eat with a spoon or putting on a hat (Snyder & Scherer, 2004). The multi-scheme level consisted of a modeled sequence of object-related gestures that referred to a theme, such as reading a story to a doll,

kissing the doll, and putting it to bed (Snyder & Scherer, 2004).

Play-based assessment is not the only use for play in speech-language development. Investigators also promote language stimulation techniques implementing play therapy and parent infant programs to improve language abilities and speech production (Nagarajan et al., 2009).

Articulation Therapy

Because some children do recover and develop normally post-surgery, it is necessary to determine which children may be at risk for post-surgical delays. Research conducted by Hardin-Jones and Chapman (2008) showed clinical implications associated with identification of children who are at risk for speech-language delays post-surgery. Hardin-Jones and Chapman (2008) found that if oral stops do not begin to emerge within six-eight weeks post-surgery, an evaluation of the child's speech-language should occur. These recommendations and those of other researchers lead to the indication that clinical treatment for toddlers with cleft palate should focus on producing pressure consonants to be able to appropriately assess velopharyngeal functioning (Hardin-Jones & Chapman, 2008). SLPs can also begin working on increasing the variety of oral consonants to reduce nasal and glottal substitutions before these errors integrate into the child's developing phonological system (Hardin-Jones et

al., 2006). Pairing voiceless consonants with whispered vowels to prevent the glottal stop from occurring is a common strategy to eliminate glottal substitutions (Hardin-Jones, et al., 2006).

Combining goals for consonant inventory with vocabulary is an efficient approach for early intervention with toddlers with cleft palate (Hardin-Jones et al., 2006). Words chosen for this intervention must be functional containing typical early names for people and items, adjectives, possession, action, and location (Hardin-Jones et al., 2006). Simple syllable structure and consonants within the child's inventory must be integrated as well, and as the vocabulary expands, new sounds not in the current inventory can be added (Hardin-Jones, et al., 2006). Typically, words with stop consonants are introduced first and fricatives later (Hardin-Jones et al., 2006).

Kummer (2011) reported that standard articulation therapy may also target correction of misarticulations of placement or manner during production. Typical therapy identifies phonemes to be targeted first based on stimulability and sounds that will most effect intelligibility (Kummer, 2011). Developmental sequences are not always the best approach (Kummer, 2011). A phonological approach may be a better choice for correction, if multiple errors exist in a single class of speech sounds (Kummer, 2011), which was touched upon previously in this paper. Auditory and visual discrimination of sounds is the first step

in standard articulation therapy to determine the child's ability to identify target productions from incorrect productions of sounds (Kummer, 2011). Targeting anterior sounds is an easy transition into articulation therapy because they are the most visible in the oral cavity (Kummer, 2011), enhancing the child's ability to reproduce the placement with visual aid using a mirror or model. Continuant sounds should begin with the voiceless cognate in isolation, adding voicing progressively (Kummer, 2011). Plosives may be targeted with voiced cognates in consonant-vowel syllables to increase success (Kummer, 2011). Establishing correct placement should be the next focus, followed by manner of production (Kummer, 2011). When transitioning from one sound in a class to the next, change only one of the following features at a time: placement, manner, or voicing (Kummer, 2011). Furthermore, caregiver education and instruction is necessary for carryover into the child's natural environment and may increase correct sound production in spontaneous speech (Kummer, 2011).

Velopharyngeal Management

Velopharyngeal dysfunction or insufficiency occurs when there is not an adequate amount of separation between the oral and nasal cavities during speech production by the actions of the velum and pharynx (Nagarajan, et al., 2009). Nagarajan et al. (2009) stated that the first step in assessment of

velopharyngeal dysfunction involves a detailed perceptual evaluation, by assessing how speech across many different levels such as syllables, words, and sentences increases the demand on velopharyngeal function (Nagarajan et al., 2009). As previously mentioned nasoendoscopy and videofluoroscopy allow the assessor to directly view the anatomical structure and physiological defects that cause velopharyngeal dysfunction.

Oral motor exercise such as blowing activities to increase awareness of oral airflow to teach sound production may be integrated sparingly as well, but are not recommended to strengthen the velopharyngeal mechanism (Hardin-Jones et al., 2006). Oral motor exercises used to strengthen the velopharyngeal mechanism are not backed by empirical research and do not address the speech production issue at hand. Hardin-Jones and Chapman (2008) indicated the ineffectiveness of oral motor exercises, noting that oral motor speech deficits have never been identified as a cause for speech delays in children with cleft palate.

One treatment method that may assist in strengthening the velopharyngeal musculature was described by Kuehn and Henne (2003). According to Kuehn and Henne (2003) continuous positive airway pressure (CPAP) may be introduced if the velopharyngeal gap is small, the velum moves adequately, and hypernasality is rated as mild to moderate (Kuehn & Henne, 2003). Surgery may be

avoided in such cases (Kuehn & Henne, 2003). If surgery for velopharyngeal inconsistency has occurred and the child continues to have residual nasality, it may be due to a lack of movement of the restructured anatomy (Kummer, 2011).

Auditory feedback is used to improve this movement indirectly (Kummer, 2011). The Oral-Nasal Listener from Super-Duper is the most preferred device for auditory feedback allowing the SLP or parent to hear what the child is hearing during sound production and give appropriate feedback (Kummer, 2011). Another technique involves using a straw or a listening tube and having the child place one end at the opening of the nostril and the other end near the ear (Kummer, 2011). When nasality occurs, the difference will be more obvious for the child to hear. The SLP can then ask the child to make adjustments to articulation to improve speech and reduce nasality because the child's awareness of the nasality has increased substantially (Kummer, 2011). Nasometry is the most useful in remediating phoneme-specific nasal air emission by providing visual feedback regarding the amount of nasality generated (Kummer, 2011). Nasometry consists of the child wearing headgear with two microphones attached to it (Nationwide Children's Hospital, n.d.). The microphones are positioned in front of the nose and mouth to measure the amount of nasality that is present while the child produces single words or

connected speech aloud (Nationwide Children's Hospital, n.d.). The SLP then interprets the child's nasalance score relative to a normal "cutoff" score (Nationwide Children's Hospital, n.d.).

Effects on Voice

Those with cleft lip and palate may also experience dysphonia caused by increased respiratory and muscular effort, and hyper-adduction of vocal folds while attempting to close the velopharyngeal valve (Nagarajan, et al., 2009). It is characterized by breathiness, hoarseness, and low intensity of voice during speech (Nagarajan, et al., 2009).

Future Research

Little research has been conducted on language intervention besides the use of naturalistic intervention for children with cleft palate. This lack of research leads to questions about language intervention. For example, what changes in the implementation and focus of language intervention with children who have cleft palates in comparison to those children who need language intervention but do not have a cleft palate? What are the steps necessary for implementation of language intervention with children with cleft palate? In addition to broad, general research questions, several more specific questions could also be formulated within the two thoughts such as, if language assessment and interventions for cleft palate children do differ, is the development and implementation of unique

assessment tools and intervention protocols necessary for increased treatment efficacy?

Focus on future research is important because having a language delay or deficit may affect other aspects of cognitive development, such as reading. Furthermore, if language in children with cleft palate has different attributes than children without facial anomalies, it is important for future investigations to pinpoint these differential areas and begin establishing ways to treat or compensate for these deficits.

Additional research may also focus on psychological or emotional factors that children with cleft palate may experience due to decreased articulation ability and how this negatively impacts language development. It may be possible that children who are self-conscience of articulation deficits related to cleft palate will produce less language. Could this lack of voluntary language production affect overall expressive language development?

Moreover, it would be interesting to determine which areas of language are mostly impacted by hearing deficits related to cleft palate (e.g., receptive or expressive language) and ways to compensate specifically for the deficits found. As hearing impairment appears to have a residual deficit and may have a strong impact on language development (Zanzi et al., 2002), future investigations may focus on treating children with cleft

palate as if they have a primary hearing deficit. Additionally, comparisons could be made between children with cleft palate who are not introduced to sign language or baby sign as infants and those cleft palate children who are introduced to sign language or baby sign as infants. Researching this topic could assist in reducing deficits in language development related to hearing impairment secondary to cleft palate.

Conclusion

Cleft palate is a complex issue that may be physically corrected with surgery, but still affects children through speech and language development. Feeding is an additional concern, since lack of nutrition could negatively affect growth and overall development. Cleft palate should be addressed early by multiple disciplines to guarantee that a child has the best chance at making progress in the area of speech and language. Early intervention may focus strongly on articulation because of the compensatory strategies children learned when speaking with a structural deficit, a cleft palate. Language may also be affected in the process of development with a cleft palate and must be evaluated appropriately to measure language abilities.

In conclusion, this review is a basis of studies that have focused on cleft palate and issues that arise in treating this physical anomaly. The cleft palate population requires individualized attention from SLPs regarding speech, language,

and feeding. Additional services such as hearing, dentistry, and surgery involve team work in which SLPs represent a crucial part. Therefore, SLPs should be knowledgeable in how these areas may assist in the effectiveness of speech-language treatment.

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