

# Development Outcomes of Thai Children with Cleft Lip/Palate at 5-Years-Old

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**Objective:** To measure the development outcomes among Thai children with non-syndromic cleft lip and/or palate (CLP) treated at the Tawanchai Center 5 years after birth.

**Material and Method:** Using a developmental screening test, Thai children with CLP were followed-up at the center.

**Results:** Nearly two-thirds (62.5%) of 24 Thai children with CLP had delayed development. Eight of the children had more than one delayed category and 13 both "delayed" and "caution". Delayed language, personal, social and fine motor skills occurred in 54.2%, 20.8% (5/24) and 20.8% (5/24) of cases, respectively.

**Conclusion:** An understanding of the incidence of the different types of delays will help our center to improve our treatment standards and place more emphasis on psychosocial and development outcomes.

**Keywords:** Developmental, Children, Cleft lip, Cleft palate

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The prevalence of non-syndromic or facial clefts (CLP) in Thai children is 2.5 per 1,000. The anomaly occurs during the first trimester of pregnancy<sup>(1)</sup> and affects babies in many developmental dimensions including facial appearance, self-esteem, speech fluency, conductive hearing loss (from recurrent middle ear infection), dentition and delayed development<sup>(2)</sup> including physical, social adaptation and socio-emotional problems<sup>(3,4)</sup>. Mothers of these children experience anxiety and loss of confidence to properly care for their children<sup>(5)</sup>. These maternal factors exacerbate the child's poor development.

Priester & Goorhuis-Brouwer reported that delayed speech and language development of toddlers with CLP could be corrected with appropriate surgery and multi-modal treatment following standard guidelines<sup>(6)</sup>. Meanwhile Kapp-Simon & Krueckeberg found that 4- to 36-month-old children with CLP had a higher risk for delayed eye-hand coordination<sup>(7)</sup>. Notwithstanding, Colett et al found that cleft lip children between 1 and 7 years of age had as good a language function and academic achievement as normal

children. Thus, the delayed development may be caused by, or at least worsened by, poor socio-economic background as opposed to being solely organic in nature<sup>(8)</sup>. Several studies reported opposite trends, as cognitive and psychomotor function and expressive language of CLP children was delayed compared to normal children<sup>(9-14)</sup>.

The Tawanchai Craniofacial Center, Khon Kaen University, Thailand-a comprehensive and multi-disciplinary healthcare center-has developed standard guidelines for the treatment of children with CLP. The Centre conducted a 5-year follow-up of outcomes vis-a-vis child development, particularly as to whether or not these children were developmentally delayed.

## Objective

To record the development of Thai children with CLP primarily treated at the Tawanchai Craniofacial Center using our management guidelines from the first diagnosis to between 5-6 years of age. The authors' ultimate goal was to initiate and/or improve interventions for better long-term outcomes and quality of life both for the children and their caregivers.

## Material and Method

The present study was part of the Five-year Outcome Project of Tawanchai Craniofacial Research

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Center on the Treatment of the Children with CLP. The research protocols were reviewed and approved by the Ethics Committee of Khon Kaen University.

The measurement instrument was a Denver Developmental Screening Test Denver II, first developed by William K. Frankenberg<sup>(15)</sup>. In Thailand, the Denver II was translated for Thai children in 1998. The test is divided into four categories: (1) personal/social (PS) (2) fine motor function (FM) (3) language (L) and (4) gross motor functions (GM). The test consists of up to 125 items. The age covered by the test ranges from birth to six years of age. The scale reflects what percentage of a certain age group is able to perform a certain task: "Normal" means the child can perform the item that 75% of children can. "Delayed" means that the child does not perform or refuses to perform an activity that can be performed by over 90% of children of the same age. "Caution" means that the child does not perform or refuses(R) to perform an activity conducted by 75-90% of children of the same age.

Case studies included 24 children with cleft (bilateral cleft lip/palate, BCLP and unilateral cleft lip/palate, UCLP) between 4 and 5 years of age treated at the Tawanchai Craniofacial Care Center after they had followed the treatment protocol; including surgery, orthodontics and speech therapy. A Developmental Nurse Specialist conducted the DDST for each child

one by one and the data was collected between May and December, 2011

## Results

The respective male to female ratio of volunteers in the current research was 10 to 14 (41.7% and 58.3%). The BCLP to UCLP ratio was 5: 19 (or 20.8% and 79.2%). Most of the mothers worked in agriculture (14/24 or 58.3%). The respective level of education completed by the mothers was secondary school (50%), high school (33.3%) and bachelor degree (16.7%). Monthly incomes were < 10,000 baht for 20 of the families (83.3%).

A total of 24 children were assessed using the developmental test. A child's development was considered "Delayed" if he/she did not perform or refused to perform an activity performed by over 90% children of the same age. A child with one or more delays in any one of the caution items was categorized as "delayed". "Delayed" children accounted for 15 of our 24 cases (62.5%) (8 had more than one delay and 13 had both "delays" and "cautions").

The most common delay was in language (13/24;54.16%). Children with delayed (a) personal and/or social skills and (b) fine motor skills were 5/24 (20.8%) and 5/24 (20.8%), respectively. A "caution" means a child refused or could not perform an activity conducted by 75 to 90% of children of the same age. There were 3/

**Table 1.** Demographic data of Thai children with CLP

| Sex  | Number | %     |
|--|--------|-------|
| Boys   | 10     | 41.66 |
| Girls  | 14     | 58.34 |
| Diagnosis  |        |       |
| BCLP   | 5      | 20.83 |
| UCLP   | 19     | 79.17 |
| Career of the mother                                 |        |       |
| Agriculture  | 14     | 58.34 |
| Housewife  | 4      | 16.67 |
| Merchant   | 2      | 8.33  |
| Laborer/Employee                                     | 2      | 8.33  |
| Civil servant  | 2      | 8.33  |
| Education level                                      |        |       |
| Secondary school                                     | 12     | 50.00 |
| High school/Vocational school                        | 8      | 33.33 |
| Bachelor degree                                      | 4      | 16.67 |
| Household income (baht)/month (1 USD = 30 Thai baht) |        |       |
| < 5,000  | 9      | 37.50 |
| 5,001-9,999  | 11     | 45.83 |
| 10,000-20,000  | 3      | 12.50 |
| > 20,000   | 1      | 4.17  |

24 children (12.5%) with “cautions” 2 in a language category and 1 in a personal social category. None of the children showed any delayed gross motor development.

### Discussion

Thai children with CLP in the current study treated at the Tawanchai Cleft Center belonged to the non-syndromic group and mostly had a unilateral presentation. Most of the patients were from low income families. The authors’ findings suggest that the children in this group presented delayed development, especially in language and psycho-social domains.

A language delay was reported for 54.16% of our cases compared to 21% among toddlers in a study in the Netherlands<sup>(6)</sup>. These results stimulated us to

speed up attention to developmental issues among the authors CLP patients. The authors also need to focus more attention on language production<sup>(13)</sup>, which was found to be delayed in ~21%, of the present cases. The primary causes are development problems of the organ of articulation and hearing deficits<sup>(14)</sup>. In developing countries such as Thailand, the cause of delayed development may also be from poor access to healthcare and lack of general knowledge and poverty (83% of the families in the present study have an income <10,000 baht/month).

Neiman found delayed development among infants was responsible for delays in language at 3years<sup>(16)</sup>. Some studies observed that a predictor of delayed development in these children included (a) difficulty accessing healthcare (b) poor access to

**Table 2.** Patient ID and presenting “delay” and “caution” and items detected as “delayed” and “caution” in application of the DDST-R, per area/category of test\*

| ID  | Sex | Age<br>(Yr, Mo) | GM      |         | L       |         | FM      |         | PS      |         |
|-----|-----|-----------------|---------|---------|---------|---------|---------|---------|---------|---------|
|     |     |                 | caution | delayed | caution | delayed | caution | delayed | caution | delayed |
| 21  | M   | 5,8             | -       | -       | 1       | 1       | -       | -       | -       | -       |
| 22  | M   | 5,6             | -       | -       | 2       | 1       | -       | -       | -       | 2       |
| 33  | F   | 5,7             | -       | -       | -       | -       | -       | -       | 1       | -       |
| 44  | F   | 5,0             | -       | -       | -       | -       | -       | -       | -       | -       |
| 55  | M   | 5,9             | -       | -       | -       | 1       | -       | -       | -       | 1       |
| 66  | F   | 5,9             | -       | -       | -       | -       | -       | -       | -       | -       |
| 77  | F   | 5,6             | -       | -       | -       | 1       | -       | -       | -       | -       |
| 88  | F   | 5,9             | -       | -       | 1       | 1       | -       | -       | -       | -       |
| 99  | F   | 4,9             | -       | -       | 4       | 7       | R       | -       | 1       | -       |
| 110 | F   | 5,8             | -       | -       | 1       | 3       | 1       | 2       | -       | 1       |
| 111 | F   | 5,8             | -       | -       | 1       | 1       | -       | -       | -       | -       |
| 112 | F   | 5,3             | -       | -       | -       | -       | 1       | 1       | -       | -       |
| 113 | M   | 4,11            | -       | -       | -       | -       | -       | -       | -       | -       |
| 114 | F   | 4,11            | -       | -       | -       | -       | -       | -       | -       | -       |
| 115 | M   | 4,6             | -       | -       | -       | 2       | -       | -       | 1       | 1       |
| 116 | F   | 4,9             | -       | -       | 3       | 3       | 1       | 1       | -       | -       |
| 117 | F   | 4,7             | -       | -       | -       | -       | -       | -       | -       | -       |
| 118 | M   | 4,8             | -       | -       | 1       | 1       | -       | -       | -       | -       |
| 119 | M   | 5,0             | -       | -       | 1       | -       | -       | -       | -       | -       |
| 220 | M   | 4,8             | -       | -       | 2       | 1       | 2       | -       | -       | -       |
| 221 | F   | 4,11            | -       | -       | 1       | -       | -       | -       | -       | -       |
| 222 | F   | 5,4             | -       | -       | 3       | 1       | -       | -       | -       | -       |
| 223 | F   | 4,7             | -       | -       | -       | -       | -       | -       | -       | -       |
| 224 | M   | 4,8             | -       | -       | -       | -       | 2       | 1       | -       | 2       |

\* Delayed is defined as ‘a child who does not perform or refuses to perform an activity that is conducted by over 90% of children of the same age’

\* Caution is defined as ‘a child who does not perform or refuses to perform an activity that is conducted by 75 to 90% of children at the same age’

GM = gross motor, L = language, FM = fine motor, PS = personal and social development

professional assistance and (c) problems with the mother-child interaction before the child reached 2 years of age<sup>(8)</sup>. Awareness of such developmental delays will help the authors Center to improve its treatment guidelines; giving more emphasis to the psychosocial domains of care and teaching parents how to promote their child's cognitive and language development from birth.

### Conclusion

At the five-year follow-up after standard longitudinal interventions at the Tawanchai Centre, Thai children with CLP were found in need of assessment and improvement of their psycho-social development and language training. This knowledge will guide the Center in putting more focus on the remediation of psychosocial domains.

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### Potential conflicts of interest

None.

### References

1. Canfield MA, Honein MA, Yuskiv N, Xing J, Mai CT, Collins JS, et al. National estimates and race/ethnic-specific variation of selected birth defects in the United States, 1999-2001. *Birth Defects Res A Clin Mol Teratol* 2006; 76: 747-56.
2. Hardin-Jones MA, Chapman KL, Wright J, Halter KA, Schulte J, Dean JA, et al. The impact of early palatal obturation on consonant development in babies with unrepaired cleft palate. *Cleft Palate Craniofac J* 2002; 39: 157-63.
3. Kapp-Simon K. Self-concept of primary-school-age children with cleft lip, cleft palate, or both. *Cleft Palate J* 1986; 23: 24-7.
4. Collett BR, Speltz ML. Social-emotional development of infants and young children with orofacial clefts. *Infants Young Child* 2006; 19: 262-91.
5. Hunt O, Burden D, Hepper P, Johnston C. The psychosocial effects of cleft lip and palate: a systematic review. *Eur J Orthod* 2005; 27: 274-85.
6. Priester GH, Goorhuis-Brouwer SM. Speech and language development in toddlers with and without cleft palate. *Int J Pediatr Otorhinolaryngol* 2008; 72: 801-6.
7. Kapp-Simon KA, Krueckeberg S. Mental development in infants with cleft lip and/or palate. *Cleft Palate Craniofac J* 2000; 37: 65-70.
8. Collett BR, Leroux B, Speltz ML. Language and early reading among children with orofacial clefts. *Cleft Palate Craniofac J* 2010; 47: 284-92.
9. Speltz ML, Endriga MC, Hill S, Maris CL, Jones K, Omnell ML. Cognitive and psychomotor development of infants with orofacial clefts. *J Pediatr Psychol* 2000; 25: 185-90.
10. Young SE, Purcell AA, Ballard KJ. Expressive language skills in Chinese Singaporean preschoolers with nonsyndromic cleft lip and/or palate. *Int J Pediatr Otorhinolaryngol* 2010; 74: 456-64.
11. Chapman KL, Graham KT, Gooch J, Visconti C. Conversational skills of preschool and school-age children with cleft lip and palate. *Cleft Palate Craniofac J* 1998; 35: 503-16.
12. Frederickson MS, Chapman KL, Hardin-Jones M. Conversational skills of children with cleft lip and palate: a replication and extension. *Cleft Palate Craniofac J* 2006; 43: 179-88.
13. Ruitter JS, Korsten-Meijer AG, Goorhuis-Brouwer SM. Communicative abilities in toddlers and in early school age children with cleft palate. *Int J Pediatr Otorhinolaryngol* 2009; 73: 693-8.
14. Broen PA, Devers MC, Doyle SS, Prouty JM, Moller KT. Acquisition of linguistic and cognitive skills by children with cleft palate. *J Speech Lang Hear Res* 1998; 41: 676-87.
15. Frankenburg WM. Denver II training manual. 2nd ed. Aurora, CO: Denver Developmental Materials; 1992.
16. Neiman GS, Savage HE. Development of infants and toddlers with clefts from birth to three years of age. *Cleft Palate Craniofac J* 1997; 34: 218-25.

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## พัฒนาการของเด็กปากแหว่งเพดานโหว่ที่มีอายุ 5 ปี

สมจิตร์ หร่งบุตรศรี, นิรมล พัจนสุนทร, สุธีรา ประดับวงษ์, บวรศิลป์ เชาวนชื่น

**วัตถุประสงค์:** เพื่อการประเมินพัฒนาการเด็กไทยที่มีภาวะปากแหว่งเพดานโหว่ที่ได้รับการรักษาที่ศูนย์ตะวันฉายที่มีอายุ 5 ปี

**วัสดุและวิธีการ:** เป็นการประเมินพัฒนาการโดยใช้แบบประเมิน Denver Developmental Screening Test (DDST) ฉบับที่พัฒนาปรับปรุงเป็น Denver II ใช้ประเมินพัฒนาการเด็กแรกเกิด-6 ปี แบ่งการประเมินออกเป็น 4 ด้าน คือ ด้านการช่วยเหลือตนเองและสังคม ด้านกล่อมเนื้อมัดเล็ก ด้านภาษาและกล่อมเนื้อมัดใหญ่ การศึกษาครั้งนี้ได้ทำการประเมินพัฒนาการเมื่อเด็กมาติดตามการรักษาตามนัดโดยประเมินตามช่วงอายุเด็กในขณะนั้น

**ผลการศึกษา:** เด็กเข้าร่วมโครงการทั้งสิ้น 24 คน มีเด็ก 15 คน คิดเป็น ร้อยละ 62.5 มีพัฒนาการล่าช้า ในจำนวนนี้มี 6 คน มีพัฒนาการล่าช้ามากกว่า 1 ด้าน 13 คน ที่มีทั้งพัฒนาการล่าช้าและภาวะที่ต้องเฝ้าระวังว่าจะล่าช้า มีพัฒนาการล่าช้าทางภาษา 13 คน (ร้อยละ 54.16) ด้านสังคมและการช่วยเหลือตนเอง 5 คน (ร้อยละ 20.8) กล่อมเนื้อมัดเล็ก 5 คน (ร้อยละ 20.8)

**สรุป:** ผลการศึกษาในครั้งนี้จะช่วยให้ศูนย์ตะวันฉายได้พัฒนามาตรฐานการรักษาและตระหนักถึงการดูแลด้านจิตสังคมเพื่อพัฒนาพัฒนาการของเด็กให้ดียิ่งขึ้น

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