

Aural Rehabilitation for Deaf Children: A Northeastern Thailand Experience

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Aural rehabilitation for deaf children (hearing loss > 90 dB) has been established since World War II. Many developed countries such as USA, Canada, United Kingdom, Netherlands and Australia have famous institutes providing aural rehabilitation for these children so that they are able to communicate with other people in the hearing society. Teaching programs include auditory training, speech stimulation, speech correction and developing language skills by using natural conversation and real models.

In Thailand, the most common mode of communication for deaf children is total communication which focuses on sign language, thus, limiting the ability to communicate with other people. With the realization of this problem, the preschool program for deaf children was set up in 1993 by an audiologist and a speech pathologist at the speech and hearing clinic, Department of Otolaryngology, Faculty of Medicine, Khon Kaen University. A study of 31 deaf children with the average better ear hearing threshold of 103 dB (103.5 ± 7.01), who visited the program regularly showed that it took an average of 277 days or approximately 9 months (9.25 ± 4.1) after hearing aid fitting, in acquiring spontaneous meaningful single words or 638 days or approximately 21 months (21.3 ± 4.3) in acquiring simple conversation or sentences of more than three words. The limitation and problems of the program will be discussed.

Keywords: Aural rehabilitation, Deaf children

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The most important problem of congenital deaf children is deficiency in development of speech and language. The severity of the problem depends on a variety of factors, one of which is the extent of hearing loss. In Thailand the mode of communication used to teach deaf children (hearing loss > 90 dB) is total communication which focuses on sign language. It is easy to learn sign language. However, this method of communication provides only concrete meaning, but cannot fully convey abstraction, metaphor, irony and humor⁽¹⁾. Moreover, it needs an interpreter. The oral method of communication provides verbal language which can convey ideas, feelings, and attitudes. Deaf children who can speak have independence, and can have a lot of choices in education and

occupation, but they must be taught to speak at a young age. In any case, parents must be involved in the choice of communication system the family wishes to use with their hearing handicapped child.

Teaching deaf children how to communicate verbally encompasses early detection of hearing loss, proper medical evaluation, appropriate hearing aid fitting, immediate auditory training in accordance with normal development models, speech stimulation and language skill development. Verbal communication should be taught in an orderly and systemic fashion beginning with comprehension, imitation, prompt and spontaneous production of speech.

Many determinants are involved in assessing the progress and success of training for oral communication; supportive factors including wearing a hearing aid throughout all waking hours, living in a hearing and speech stimulating environment and strict adherence to the training program at home by parents.

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However, not all children are able to learn speaking at all or at the same age and same speed with the same success. Therefore, consideration and evaluation must be taken before the decision, which mode of communication will be the choice for each child. In this regard, the spoken language prediction (SLP) index⁽²⁾ is a helpful predictive indicator and guideline. However, in very young children, it is not possible to derive an SLP index; gross development of the child has been used as a guideline to start training earlier. The aim of this study was to find out how long it will take for deaf children to learn to talk after a hearing aid has been fitted.

Material and Method

Thirty-one deaf children age 1 to 6 years who entered the preschool oral communication training program at Srinagarind Hospital Khon Kaen University during 1993 through 1996 were studied. All children had a hearing loss of more than 90 dB in the better ear without other handicaps. Diagnosis of hearing loss was made by otolaryngologists. Selection and fitting of hearing aids were performed by an audiologist in accordance with the real ear measurement. The subjects were defined into six groups of 4 to 6 children according to randomized design in the same age level, listening and utterance skills at the entrance of the program.

The training program was conducted by a teacher and an assistant under supervision of an audiologist and a speech pathologist. The children attended the program for approximately three hours once a week, comprising sequentially 5 minutes for checking hearing aid, 35 minutes for group auditory training, 15 minutes for milk break, 15 minutes for exercise, 45 minutes for speech stimulation and language development by the maternal reflexive method, 10 minutes for individual training alternative with creative activity such as painting etc. and 15 minutes for parent counseling. At the end of each session, the teacher recorded all the performances and

problems of every child, then discussed with the team and made plans for the next session. To present the results, the statistic of average, mean \pm SD, Pearson correlation coefficient between the two variables were analyzed. P-value < 0.05 was considered statistical significance.

Results

Of all the deaf children in the present study, only 19.4% lived in Khon Kaen, the remaining 80.6% were from other provinces in the northeastern region. These children were diagnosed as having deafness at the average age of 2.6 years (2.6 ± 1.2). The average hearing threshold for pure tone (500, 1000, 2000 Hz) in the better ear was 103 dB (103.5 ± 7.01). After hearing aid fitting, the children started a rehabilitation program at the average age of 2 years and 9 months (2.9 ± 1.1). The authors found that it took about 9 months (9.25 ± 4.1) to train the children to be able to produce spontaneous meaningful words or approximately 21 months (21.3 ± 4.3) to acquire simple conversation (Table 1). There was a weak correlation between the age at first starting auditory training and the number of days required to detect the first sound ($r = -0.421$, $p = 0.018$) (Fig. 1). But there was neither correlation between the degree of hearing loss and number of days required to detect the first sound ($r = 0.166$, $p = 0.372$) (Fig. 2) nor the correlation between the age at first starting auditory training and the number of days required to produce the first meaningful word ($r = -0.096$, $p = 0.609$) (Fig. 3).

Discussion

The present subjects were quite unfortunate; their deafness was detected at a rather older age compared to that reported by other investigators like Elssmann et al, Jacobson and Jacobson and Mauk who recommended detecting the hearing loss before one year⁽³⁻⁵⁾; and before 6 months by The American Joint Committee on Infant Hearing⁽⁶⁾. This was probably due to the low economic status and educa-

Table 1. Average duration of performances acquisition in days and months after the beginning of rehabilitation

Performances	Days	Months (Mean \pm SD)
Detection of sounds	110	3.7 \pm 2.9
Discrimination of sounds	239	7.9 \pm 4.9
Spontaneous production of single syllable words	277	9.3 \pm 4.1
Spontaneous production of 2-syllable words	384	12.8 \pm 7.0
Spontaneous production of 3 -syllable words	547	18.2 \pm 6.9
Simple conversation / sentences	638	21.3 \pm 4.3

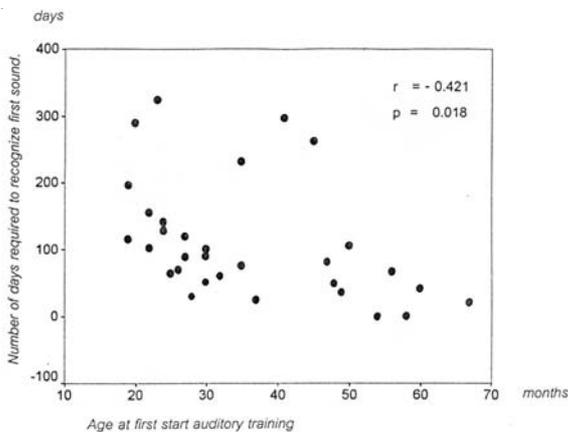


Fig. 1 The correlation between age at first starting auditory training and number of days required to recognize the first sound

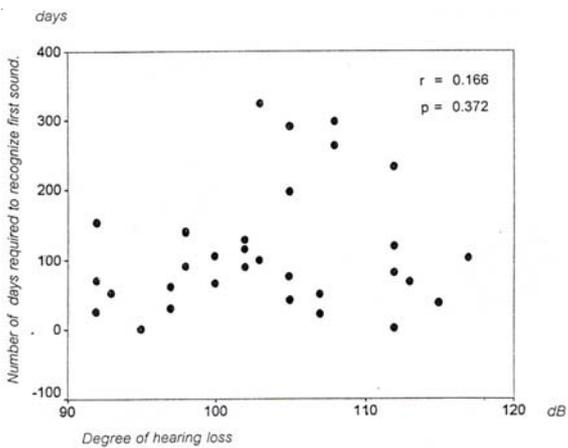


Fig. 2 The correlation between degree of hearing loss and number of days required to recognize the first sound

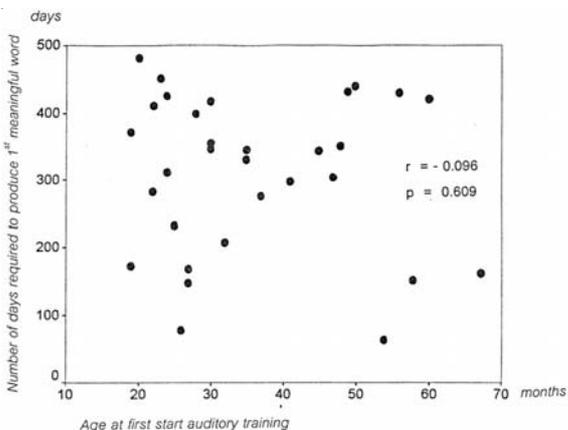


Fig. 3 The correlation between age when first starting auditory training and number of days required to produce the first meaningful word

tional level of the urban population here in the northeastern part of Thailand and Audiology Clinic of Srinagarind Hospital is the only center in this area which provides the service in evaluation of hearing in young children. Moreover, the assessment of hearing by behavioral methods was difficult in many infants and would have delayed diagnosis and the introduction of rehabilitation. However, Stein et al reported that only 11% of infants in their study were enrolled in the rehabilitation program by 6 months of age and more than half of them began between 18 to 34 months⁽⁷⁾. Although it is not easy to meet the above ideal guidelines, there should be a reduction in these delays by the use of a screening hearing test in high risk infants⁽⁸⁾ or a universal screening test by infant distraction test at 7 months of age⁽⁹⁾.

The results of the present study showed that after hearing aid fitting, the deaf children needed to be trained for approximately 3 months to know sounds or approximately 9 months to be able to produce spontaneous meaningful single words followed by 2, 3 syllable words and conversation which is nearly the same as normal speech development. There seems to be some correlation between the age at first starting auditory training and the number of days required to recognize the first sound but there is neither correlation between the degree of hearing loss and the number of days required to recognize the first sound nor the correlation between the age at first starting auditory training with the number of days required to produce the first word. This is probably due to the small number of subjects in the present study. Moreover, there are many factors involved in the efficacy of teaching deaf children to learn to talk. First, the authors' preschool program was supported by donations. There was only one teacher and an assistant to teach all the deaf children in the program. Secondly, most of the children lived outside Khon Kaen, so they could not attend the program everyday. The program could not be managed like an ordinary school for kindergarten. In this case the parents will be the key persons to continue the training at home. Thirdly, deaf children need to wear the hearing aids during all waking hours; and when the hearing aid is broken, it has to be sent to the company in Bangkok for repair which took about one month (Krisna L, 1997)⁽¹⁰⁾. If the hearing aids were out of function for both ears at the same time, the continuation of speech and hearing training will be interrupted while they were waiting for the hearing aid. Finally, the parents and

children themselves were also the important factors. The parents have to understand the child's problems and learn how to teach the child. The children should be in good health and mental status. Their differences in performance, attitude and support have much effect on progression.

Conclusion

Deaf children should be diagnosed early and rehabilitated very soon after a hearing aid has been fitted. The present study showed that deaf children need to be trained for about 9 months in order to be able to produce spontaneous single words or approximately 21 months to acquire simple conversation. However, there are many limited factors to this program, if the problems are solved, the results should be better.

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การสอนพูดสำหรับเด็กหูหนวก: ประสบการณ์ในภูมิภาคตะวันออกเฉียงเหนือของประเทศไทย

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การสอนให้เด็กหูหนวกใช้การฟังและการพูดเพื่อสื่อความหมาย (aural rehabilitation) นั้นมีมาตั้งแต่สมัยสงครามโลกครั้งที่ 2 ในประเทศที่เจริญแล้วเช่น สหรัฐอเมริกา แคนาดา อังกฤษ เนเธอร์แลนด์ และออสเตรเลีย ต่างก็มีโรงเรียนหรือสถาบันที่มีชื่อเสียงสำหรับสอนให้เด็กหูหนวกรู้จักใช้การได้ยินที่หลงเหลืออยู่ในการพัฒนาให้เกิดภาษาพูดเพื่อที่จะสื่อความหมายได้เช่นเดียวกับเด็กปกติทั่วไป วิธีการสอนใช้การฝึกฟัง การกระตุ้นให้เด็กออกเสียงพูด การแก้ไขเสียงพูดให้ชัดเจน และการฝึกให้เกิดทักษะในการใช้ภาษา ด้วยการสนทนาโดยวิธีธรรมชาติจากเหตุการณ์หรือตัวอย่างของจริง ในประเทศไทยการสอนพูดสำหรับเด็กหูหนวกมีน้อยมาก ส่วนใหญ่ใช้ระบบรวม (total communication) ซึ่งเน้นการใช้ภาษามือ คลินิกโสตสัมผัสและการพูด ภาควิชาโสต ศอ นาสิก ลาริงซ์วิทยา คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่นโดยนักโสตสัมผัสวิทยาและนักแก้ไขการพูดได้จัดทำโครงการสอนพูดสำหรับเด็กหูหนวกตั้งแต่ พ.ศ. 2536 ผลจากการศึกษาเด็กหูหนวกในโครงการที่มารับการฝึกอย่างต่อเนื่องจำนวน 31 คน และมีระดับการสูญเสียการได้ยินในช่วงที่ดีเฉลี่ย 103 เดซิเบล (103.5 ± 7.01) พบว่าหลังจากที่เด็กใส่เครื่องช่วยฟัง และได้รับการฟื้นฟูสมรรถภาพการฟังและการพูดแล้วจะต้องใช้เวลาเฉลี่ย 277 วัน (ประมาณ 9 เดือน) (9.25 ± 4.1) จึงจะเริ่มพูดคำพยางค์เดียวที่มีความหมายได้เอง หรือ 638 วัน (ประมาณ 21 เดือน) (21.3 ± 4.3) จึงจะสามารถสนทนา หรือพูดเป็นประโยคที่มีค่ามากกว่า 3 พยางค์ได้ อย่างไรก็ตามการสอนเพื่อให้เกิดสัมฤทธิ์ผลทางพัฒนาการทางภาษาและการพูดนั้น มีข้อจำกัดและจำเป็นต้องอาศัยองค์ประกอบหลายอย่างซึ่งจะได้กล่าวถึงต่อไป
