

## 신생아 청각선별검사의 결과와 비용효과 분석

문성균<sup>1</sup> · 박홍준<sup>1</sup> · 김영주<sup>1</sup> · 박문성<sup>2</sup> · 정연훈<sup>1</sup> · 박기현<sup>1</sup>

### Results and Cost-Effectiveness of Newborn Hearing Screening Program in Ajou University Hospital

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#### ABSTRACT

**Background and Objectives** : It is estimated that more than 2 in every 1,000 neonates suffers from hearing loss. Early detection with appropriate rehabilitation of congenital hearing loss can reduce the adverse developmental consequences such as language delays, and behavior and attention deficits. The purpose of this study is to evaluate our newborn hearing screening program using the combined transient evoked otoacoustic emission (TEOAE) and auditory brainstem response (ABR), and to estimate the cost-effectiveness of our program. **Materials and Method** : 6,634 infants (5,918 well babies and 716 NICU babies) underwent the newborn hearing screening program at Ajou University Hospital for 4 years. Initially well babies were screened with TEOAEs, and those failing the TEOAEs were tested with the rescreening program. Neonates failing the TEOAE rescreening and the NICU babies were examined with ABR. The cost included personnel, fringe benefits, supplies, equipment and overhead. **Results** : 660 (11%) out of 5,918 well babies failed the initial TEOAE screening and 27 (0.46%) babies failed the TEOAE rescreening. Eleven babies (0.16%), 3 of the well babies and 8 of the NICU babies, were confirmed to have hearing loss of more than 60 dB. We detected four deaf babies out of these eleven. From the four deaf babies, we confirmed a connexin 26-related deafness and an enlarged vestibular aqueduct syndrome. It cost \$6 to screen one infant and \$3,700 to detect one infant with hearing loss. **Conclusion** : We could detect 11 babies (0.16%) with hearing loss out of 6,634 neonates during the 4 years. Considering the benefits of early identification and rehabilitation of congenital hearing loss, the cost for the newborn hearing screen program is affordable. The newborn hearing screen should be extended as a national health program. (Korean J Otolaryngol 2002;45:1052-6)

**KEY WORDS** : Newborn hearing screening program · TEOAE · ABR · Cost and cost analysis.

가  
1,000 2 6 11  
1)2) 가  
2 가 가 3)4) 6  
5) 가 가 1960  
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: (031) 219 - 5265 · : (031) 219 - 5264  
E - mail : parkkh@madang.ajou.ac.kr (behavioral observation audiometry),  
(auditory brainstem response),

가 (evoked otoacoustic emission)  
 1993 NIH  
 2  
 7)  
 (adrenal hyperplasia),  
 (galactosemia), (phenylketo-  
 nuria), (hypothyroidism) 8)  
 9)10)  
 1998 가  
 (transient evoked otoacoustic  
 emission)

reproducibility가 50%  
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 가 50% 3 reproducibility  
 3 dB , 3 3 dB  
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 4  
 (tympanometry)  
 Navigator SE(Bio - Logic System,  
 Virtual 310(Virtual Co., USA)  
 USA) ,  
 가 60 dB  
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(Fig. 1).

가  
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 3,542 3,474  
 ILO 92(Otodynamics, England, UK)  
 2  
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 가 35.3 dB

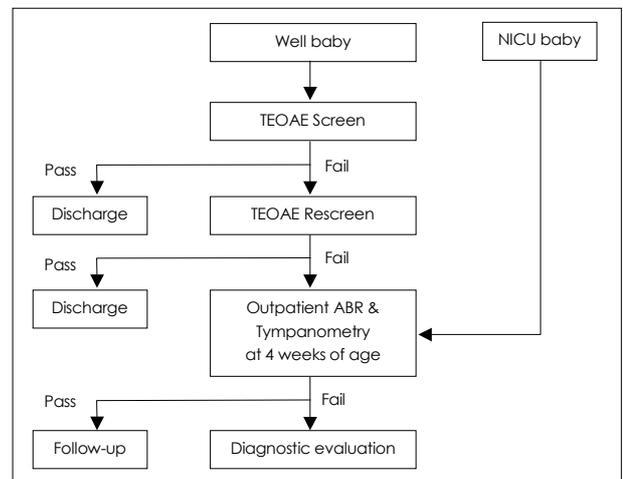


Fig. 1. Newborn hearing screen protocol of Aju University Hospital.

probe  
가 3,500 가 4  
가 28% 29%,  
(11)  
(referral rate)  
(positive predictive value)  
5,918 1  
660 (11%) 63  
(1.06%) 2 27  
(0.46%)  
가 가 21 3  
14.3%  
1998 3 2001 12  
7,016 6,634  
5,918  
27 21  
3 (0.05%) 60 dB  
1,098 716  
8 (1.11%) 60  
dB (Fig. 2). 6,634  
11 (0.16%) 60 dB  
11 5  
6 9  
2 가 90 dB  
가 4 connexin 26  
12)  
enlarged vestibular aqueduct syndrome<sup>13)</sup>  
2000 44 5,330 . 1

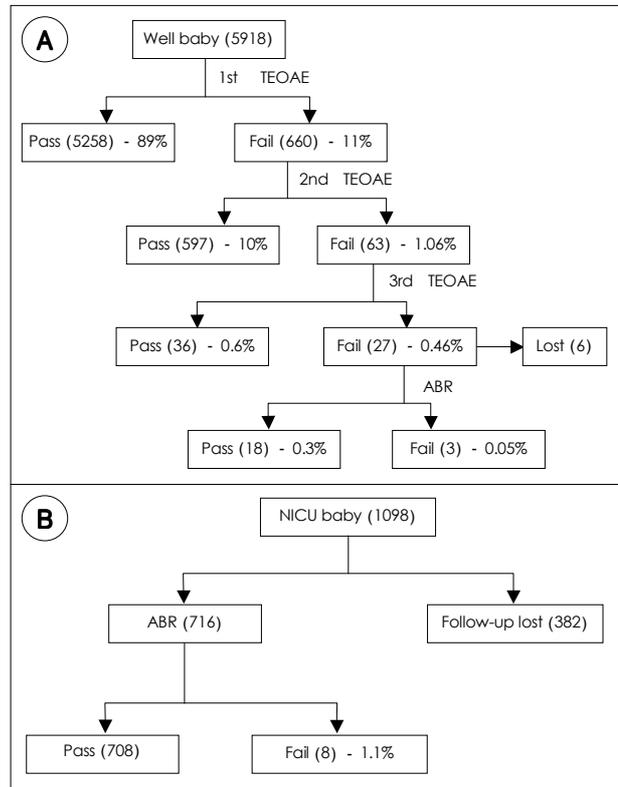


Fig. 2. Results of newborn hearing screen program for 6,634 neonates. A : well babies. B : NICU babies.

Table 1. Actual cost of operating a newborn hearing screen program in Ajou University Hospital

Item	Amount
Audiologist (12hr/wk)	₩20,450,000
Supplies	₩9,680,000
Equipment	₩11,520,000
Fringe benefit	₩5,720,000
Overhead	₩5,930,000
<b>Total</b>	<b>₩53,300,000</b>
Screening one infant	₩8,000
Identifying one infant with hearing loss	₩4,850,000

2 가 1  
6634  
2,045  
probe  
968  
가 1,152  
29% 28%  
가 6,634  
2000 44 5,330 . 1



REFERENCES

0.4%  
 11)19)  
 1% 12%  
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 6,634 가  
 5,330  
 1 8,000 ( \$6)  
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 가 가 가  
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 1998  
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 6,634  
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