Ear Diseases and Hearing in the Thai Elderly Population. Part II. A One Year Follow-up Study

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Abstract

The ear and hearing survey of the Thai elderly in 14 urban communities around Siriraj Hospital was repeated one year after the first survey in order to detect any changes. Altogether 556 elderly people came for follow-up examination, 191 were males, 365 were females, the average age was 68.2 yeas (60-88 years). Ear disease was diagnosed by ENT specialists in 80 cases which implied that the prevalence of ear disease was 14.4 per cent. This was not statistically significantly different from the prevalence of ear disease in the survey conducted in the previous year and although the elderly who had ear diseases in the first survey had already been treated, the prevalence did not decrease. Some elderly people only had ear diseases in this survey. Hearing evaluation by pure tone audiometry was performed in 549 elders. There were 12.4 per cent who had bilateral, moderate to severe hearing loss which was 2.9 per cent higher than in the previous survey. The hearing level had also deteriorated in 14.3 per cent of the elderly people. Tympanometry was performed in 556 cases and showed that 10.5 per cent had a conductive hearing loss. When audiometry and tympanometry of the same elderly people were evaluated together, 49.2 per cent of them had a sensorineural hearing loss, 3 per cent had a conductive hearing loss and 6.5 per cent had a conductive or mixed type hearing loss. When the results of audiometry were compared with the self identification/perception of their hearing reported by the elderly in the questionnaires, they were not reliable. In conclusion, a one-year follow-up study of the prevalence of ear disease and hearing impairment in the elderly showed that the prevalence of ear disease was still high and had not changed significantly. Concerning hearing impairment, not only had the prevalence increased, but also the severity

of hearing loss. Therefore, the authors stress the need to implement the "Ear and Hearing Care" program for the elderly both in rural and urban communities at least once a year in order to improve quality of life of the elderly Thai people and to prevent complications of ear disease.

Key word : Ear Diseases, Hearing, Thai Elderly, One Year Follow-up

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Continuing from Part I of the study, the authors performed a follow-up study after one year in order to find out whether there was any change in the prevalence of ear diseases and hearing disability in the same group of elderly people.

MATERIAL AND METHOD

The survey team, consisting of ENT specialists, audiological technicians, nurses and nurse-aids, together with the same set of equipment and medicines as in the previous survey, went to the center of the same community. An appointment card was posted to all the elderly people who had been included in the previous survey. The leader of each community was also asked to remind the elderly in his/her community to come for a follow-up examination.

The medical history, in particular the ear symptoms and self-identification/perception of the hearing of each elderly person was recorded, then an otoscopic examination, pure tone audiometry and tympanometry were performed in exactly the same way as in the previous survey.

The results of the ear and hearing examination were recorded and compared with the last survey in the same individual. The average hearing level from an audiogram was divided into 5 grades i.e. normal ($\leq$ 30 dB), mild degree of hearing loss (30^+ - 40 dB), moderate degree of hearing loss (40^+ - 70 dB), severe degree of hearing loss (70^+ - 90 dB), profound loss or deaf (90^+ dB)[1]. The tympanogram was defined into 3 types i.e. Type A = normal (middle ear pressure between -100 to +100 daPa), Type B = flat tympanogram (usually occurs in middle ear effusion, ear drum perforation or impacted ear wax), Type C = negative pressure > -100 daPa (usually occurs in Eustachian tube obstruction). Type B and Type C tympanograms denote conductive type of hearing loss[2].

Statistical analysis

The data were analyzed using the statistical package for the social sciences (SPSS) program. Disease prevalence was calculated as a percentage of the total study population and a 95 per cent confidence interval was given for each prevalence. The significance of differences between the variables was assessed by the Chi-square test. Pearson's correlation was used to assess the correlation between hearing level and age of the subjects using a p-value of less than 0.05 as significant.

RESULTS

This survey was performed from January 1999 to May 1999 which was approximately one year after the first survey. Among the 980 elderly persons who had participated in the first survey, 556 or 56.7 per cent came for a follow-up examination. There were 191 males (34.4%) and 365 females (65.6%), with a male and female ratio of 1 : 2. Their ages ranged from 60 to 88 years with an average age of 68.2 years. Comparison of the characteristics of the elderly in the first and second surveys showed no significant difference. Therefore, the group of elderly who had a follow-up examination was representative of the whole group.

The elderly, who did not come, were contacted *via* telephone by one member of the team. However, only 199 cases could be traced by phone,

in addition 12 cases had already passed away and 10 cases had moved outside the survey region. The questions asked were 1) about ear symptoms :- 27 elderly reported ear itchiness, 8 cases reported noise in the ear and 3 cases experienced dizziness 2) about hearing problems :- 9 elderly had fullness in the ear, 13 cases reported worsening of hearing. The rest of them said that they had no ear or hearing problems.

Otoscopic examination revealed normal findings in 476 cases, 80 cases (14.4%) had ear diseases which were divided into external ear diseases (28 cases or 5%), middle ear diseases (30 cases or 5.4%) and 22 cases (3.9%) had other abnormalities. Details of the ear diseases encountered are shown in Table 1.

Therefore, the prevalence of ear diseases diagnosed in the elderly in the second survey was 14.4 per cent (95% confidence interval = 11.5-17.3). The prevalence of ear disease had decreased, especially impacted ear wax, because these diseases had already been treated during the first survey. However, many elderly people developed new ear diseases which were detected in the second survey. So when compared to the prevalence found in the first survey i.e. 16.3 per cent there was no statistically significant difference (p = 0.351).

Comparison of the prevalence and types of ear diseases, found in the same group of elderly examined one year apart, is shown in Table 2.

Hearing evaluation by pure tone audiometry performed in 549 of the elderly showed nor-

Table 1. Types and frequency of ear diseases found in 556 elderly people.

	N	%
Otitis media with effusion	19	3.4
Otitis externa	16	3.0
Impacted wax	10	1.9
Dry perforation of TM	7	1.3
Chronic otitis media	4	0.7
Foreign body in the ear	2	0.3
Others (abnormal TM, ET obstruction, etc.)	22	3.9
Total	80	14.4

Note : TM = Tympanic membrane
ET = Eustachian tube

Table 2. Comparison of the prevalence and types of ear diseases in 556 elderly people found in the first and second surveys.

Ear diseases found in the first survey	Ear diseases found in the second survey									
	Normal	Wax	OE	FB	OME	Dry	COM	Others	Total	%
Normal	408	6	11	1	11	1	2	18	458	82.4
Wax	34	4	3	1	4	-	-	1	47	8.5
OE	20	-	2	-	3	-	-	-	25	4.5
FB	-	-	-	-	-	-	-	1	1	0.2
OME	2	-	-	-	-	-	-	-	2	0.4
Dry	-	-	-	-	-	4	1	-	5	0.9
COM	-	-	-	-	-	1	1	-	2	0.4
Others	12	-	-	-	1	1	-	2	16	2.9
Total	476	10	16	2	19	7	4	22	556	
%	85.6	1.8	2.9	0.4	3.4	1.3	0.7	4.0	100.0	

Note : OE = Otitis externa, OME= Otitis media with effusion, FB = Foreign body,
Dry = Dry perforation of tympanic membrane, COM = Chronic otitis media

mal hearing in 237 cases or 43.2 per cent, abnormally low hearing level in 312 cases (56.8%), 86 cases (15.6%) had unilateral and 226 cases (41.2%) had bilateral hearing loss. The prevalence of hearing loss had increased 4.4 per cent from the previous survey (i.e. 52.4% *vs* 56.8%).

The grading of hearing impairment is shown in Table 3. It was found that 12.4 per cent of the elderly had bilateral, moderate to severe hearing loss which was 2.9 per cent higher than in the last survey i.e. 9.5 per cent *vs* 12.4 per cent.

The hearing level at each frequency tested in the elderly people was not different between right and left ears but the hearing level at high frequencies in males was slightly lower than in females (see Fig. 1).

When the hearing level was divided according to the three age groups i.e. 60-69 years, 70-79 years and over 80 years, the average hearing loss was significantly different between each age group ($p < 0.05$). This implies that hearing loss increases with increasing age (see Fig. 2). The correlation between average hearing level and age was shown to be significant by Pearson's correlation with a p value = 0.01.

A one year follow-up examination by audiometry clearly showed that 6.6 per cent of the elderly who had a normal hearing level in the first survey had abnormal audiograms in the second survey. Moreover 7.7 per cent of the elderly who already had hearing loss showed a deterioration of their hearing level. Therefore, altogether, 14.3 per cent exhibited progressive hearing loss within the one year period.

Self - identification/perception of the hearing obtained during history taking was defined into 3 grades i.e. "good", "impaired" and "no hearing". When compared with the audiograms, 84.1 per cent of those who identified themselves as having "good hearing" had a normal audiogram. Those who identified themselves as having "impaired hearing" still had a normal audiogram in 47.5 per cent while three who identified themselves as having "no hearing", all had profound hearing loss in the audiograms.

Tympanometry was performed in 556 elderly people. 477 cases (89.5%) had a normal tympanogram and 56 (10.5%) had an abnormal tympanogram. Tympanomtery could not be performed due to a perforated ear drum in 4 cases, and another 19 cases, could not be evaluated for various reasons.

Abnormal tympanograms in 56 cases were Type B 31 cases or 5.8 per cent, Type C 25 cases or 4.7 per cent. When the results of tympanometry were interpreted in combination with the results of audiometry, it was found that 217 of the elderly or 41.3 per cent had normal hearing. Abnormal hearing was identified to be sensorineural hearing loss in 259 cases (49.2%), conductive hearing loss or Eustachian tube obstruction in 16 cases (3.0%) and conductive or mixed type hearing loss in 34 cases (6.5%).

The elderly people who had moderate to severe hearing loss in both ears were given appointments to have full investigations and hearing aids fitted with auditory rehabilitation at the Department of Otolaryngology, Faculty of Medicine Siriraj Hospital. Most of the elderly who had ear diseases were treated immediately at the survey site and further management at Siriraj Hospital was recommended.

DISCUSSION

The data from the one year follow-up survey clearly showed that the prevalence of common ear diseases of the elderly in the urban community

Table 3. Grading of hearing loss from audiometric evaluation in 549 elderly people.

Degree of hearing loss	The elderly with abnormal hearing					
	Unilateral		Bilateral		Total	
	N	%	N	%	N	%
Mild (30^+ - 40 dB)	71	12.9	158	28.8	229	41.7
Moderate (40^+ - 70 dB)	11	2.0	60	10.9	71	12.9
Severe (70^+ - 90 dB)	4	0.7	6	1.1	10	0.8
Deaf (90^+ dB)	-	-	2	0.4	2	0.4
Total	86	15.6	226	41.2	312	56.8

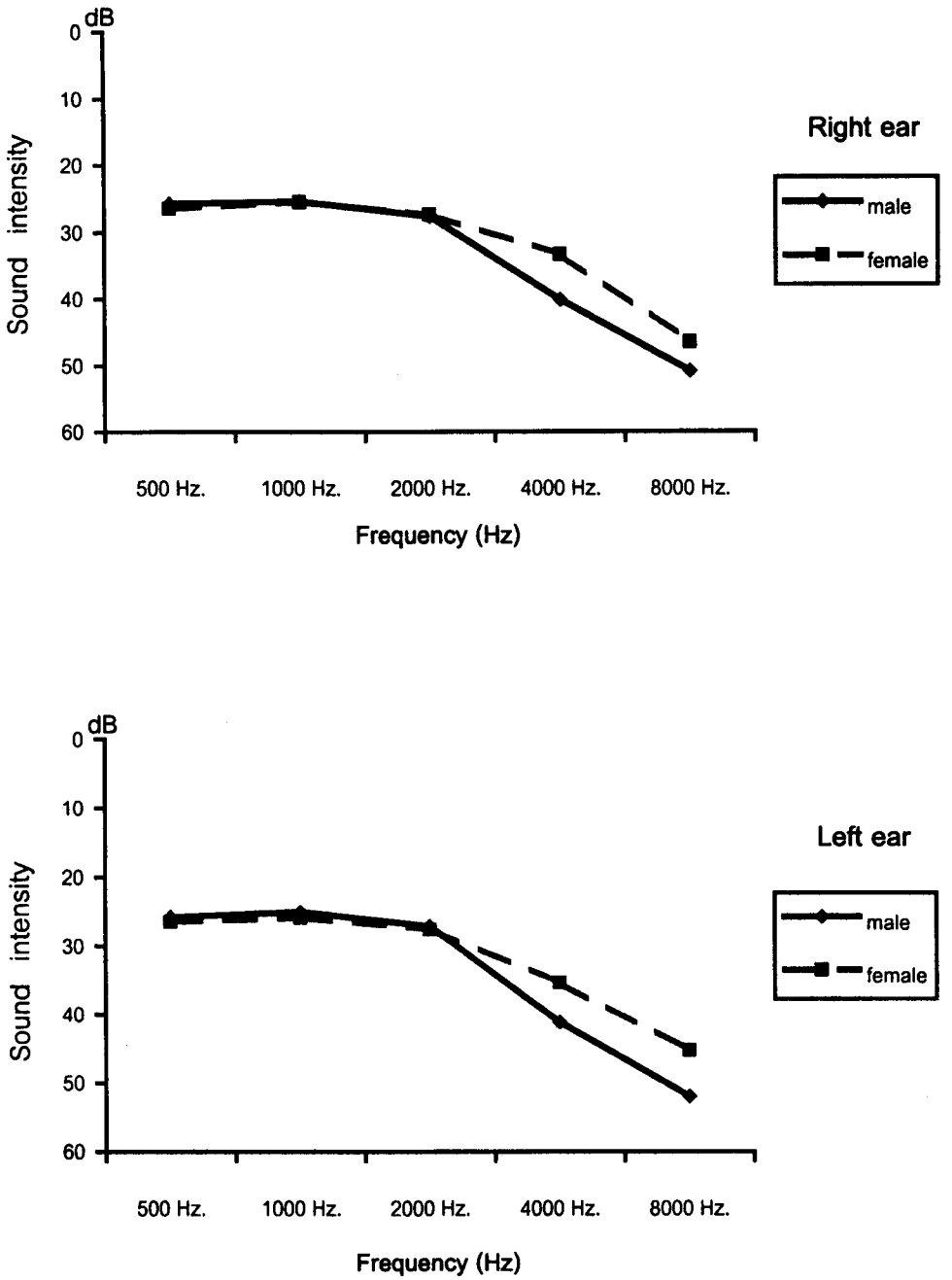

Fig. 1. Average hearing loss in right and left ears in male and female elderly people.

is persistently high. Although the elderly had been treated for their ear diseases in the previous survey, the prevalence was not significantly decreased.

The prevalence of hearing impairment in the same group of elderly people had also increased and the hearing level had definitely deteriorated within one year. The finding that self identification/perception of hearing did not correlate with the audiometric test showed us that a hearing survey, using only questionnaires, may not be sufficient.

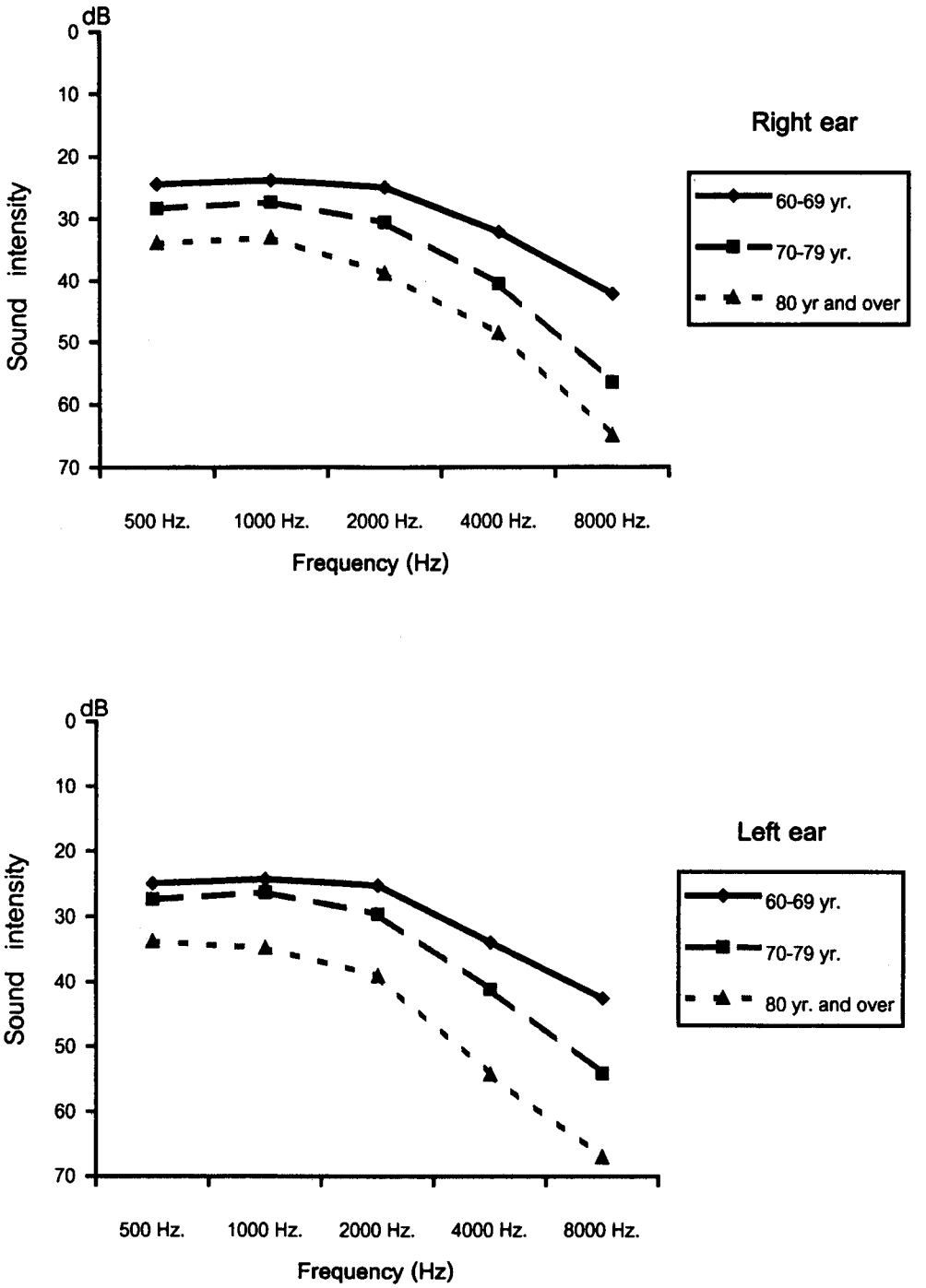

Fig. 2. **Average hearing loss in different age groups of the right and left ears showing that hearing loss increases with increasing age.**

Therefore, the authors would like to confirm the need for an "Ear and Hearing Care" program with all the portable equipments and ENT specialists as stated in the Part I report. This program will certainly improve the quality of life of elderly Thais who are increasing in number every year.

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โรคหูและการได้ยินในผู้สูงอายุไทย ตอนที่ 2. การศึกษาติดตามโรคหูและการได้ยินในผู้สูงอายุไทยระยะเวลา 1 ปี

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ได้ทำการสำรวจความชุกของโรคหู และการสูญเสียการได้ยินของผู้สูงอายุที่อาศัยอยู่ในชุมชนเมือง 14 ชุมชนรอบโรงพยาบาลศิริราช ซึ่งได้เคยทำการสำรวจไว้เมื่อปี พ.ศ. 2541 เพื่อหาความเปลี่ยนแปลง พบว่า ผู้สูงอายุมารับการตรวจซ้ำ 556 ราย (ร้อยละ 56.7) เป็นชาย 191 รายเป็นหญิง 365 ราย อายุเฉลี่ย 68.2 ปี (60–88 ปี) ผลการตรวจโดยโสต ศอ นาสิกแพทย์ พบเป็นโรคหู 80 ราย หรือ ร้อยละ 14.4 ซึ่งไม่มีความแตกต่างทางสถิติ จากความชุกของโรคหู ที่ตรวจพบในการสำรวจครั้งแรก ทั้งที่ผู้สูงอายุบางรายเคยได้รับการรักษาไปแล้วและบางรายเพิ่งตรวจพบเป็นโรคหูในการตรวจครั้งนี้ ผลการตรวจการได้ยินโดยเครื่อง audiometer ในผู้สูงอายุคนเดียวกัน จำนวน 549 รายพบว่าผู้สูงอายุร้อยละ 12.4 มีการสูญเสียการได้ยินระดับปานกลาง ถึงหูตึงมากทั้ง 2 ข้าง ซึ่งมากกว่าที่พบในการสำรวจปีที่แล้ว ร้อยละ 2.9 และยังพบว่าในระยะเวลาห่างกัน 1 ปี ผู้สูงอายุร้อยละ 14.3 มีระดับการสูญเสียการได้ยินเพิ่มมากขึ้น ผลการตรวจสมรรถภาพของหูชั้นกลางโดยเครื่อง acoustic impedance 556 ราย พบว่าผู้สูงอายุร้อยละ 10.5 มีระบบการนำเสียงเสีย เมื่อนำผลการตรวจการได้ยินและการตรวจสมรรถภาพของหูชั้นกลางมาวิเคราะห์ร่วมกัน พบว่าผู้สูงอายุร้อยละ 49.2 มีการสูญเสียการได้ยิน ชนิดประสาทรับเสียงเสีย ร้อยละ 3.0 มีการสูญเสียการได้ยินชนิด ระบบการนำเสียงเสีย และ ร้อยละ 6.5 มีการสูญเสียการได้ยินร่วมกันทั้งประสาทรับเสียงเสียและระบบการนำเสียงเสีย เมื่อนำผลการตรวจการได้ยินมาเปรียบเทียบกับ การประเมินระดับการได้ยินของตนเองในแบบสอบถาม พบว่า ผลการประเมินของผู้สูงอายุไม่แม่นยำนัก ดังนั้นโดยสรุป การศึกษาติดตามความชุกของโรคหูและการได้ยินของผู้สูงอายุในระยะเวลา 1 ปี พบว่าความชุกของโรคหูยังพบบ่อยเหมือนเดิม สำหรับการสูญเสียการได้ยินนอกจากจะพบบ่อยแล้ว ความชุกและความรุนแรงยังเพิ่มขึ้นด้วย ดังนั้นจึงมีความจำเป็นที่จะสนับสนุนและส่งเสริมให้มีการออกไปบริการตรวจรักษาโรคหู และการได้ยินแก่ผู้สูงอายุในชุมชน ทั้งในชนบท และชุมชนเมือง อย่างน้อยปีละครั้ง เพื่อให้ผู้สูงอายุไทยมีคุณภาพชีวิตที่ดีขึ้น และอาจป้องกันโรคแทรกซ้อนที่อาจเกิดตามมาได้

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