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SCREENING AND DIAGNOSTIC

Sex differences in associated factors for age-related hearing loss

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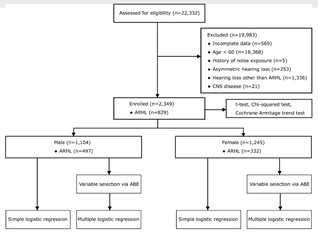
Abstract

The prevalence and age of onset of hearing loss differ according to sex. This study aimed to identify associated factors for age-related hearing loss (ARHL) and determine whether there are differences between males and females regarding associated factors for ARHL. This cross-sectional study used data from adults who underwent medical examinations including hearing tests from 2011 to 2021. A total of 2,349 individuals were included. The study conducted sex-specific analyses using both univariate and multiple regression. Univariate analysis employed logistic regression, while multiple regression involved variable selection through the augmented backward elimination method. Separate multiple logistic regression analyses were conducted for each sex. In the univariate analysis, among males, age, underweight, alcohol consumption, weight, and height exhibited statistical significance. Among females, age, hypertension, diabetes, dyslipidemia, obesity, sarcopenia, weight, height, age at menarche, and duration of hormone exposure were found to be significant factors. However, in the multiple logistic regression model for males, underweight, and smoking emerged as significant, while in females, age, weight, obesity, and age at menarche retained their significance. We found that there are different associated factors for ARHL in each sex. Assessment and counseling for smoking, obstetric history, underweight, and obesity may be beneficial in managing patients with ARHL.

Objective

To identify associated factors for ARHL and determine whether there are differences between males and females in terms of associated factors for Age-related hearing loss

Méthodes et Matériels



Variables	Total n = 2,349	Normal hearing n = 1,520	ARHL n = 829	*P*-value
Age	66.5±5.6	64.7±4.2	69.8±6.3	< .001
Sex				< .001
Male	1,104 (47)	607 (40)	497 (60)	
Female	1,245 (53)	913 (60)	332 (40)	
Hypertension	1,198 (51)	723 (48)	475 (57)	< .001
Diabetes	445 (19)	256 (17)	189 (23)	< .001
Dyslipidemia	1,165 (50)	740 (49)	425 (51)	.249
BMI				< .001
Normal	1,470 (63)	975 (64)	495 (60)	
Obesity	801 (34)	509 (34)	292 (35)	
Underweight	78 (3.3)	36 (2.4)	42 (5.1)	
Visceral adiposity	1001 (43)	633 (42)	368 (44)	.214
Sarcopenia	317 (14)	176 (12)	141 (17)	< .001
Alcohol	1,800 (77)	1,165 (77)	635 (77)	1.000
Smoking				< .001
Never	1,511 (64)	1,049 (69)	462 (56)	
Former	545 (23)	321 (21)	224 (27)	
Current	293 (13)	150 (9.9)	143 (17)	
Weight (kg)	61.6±10.4	61.5±10.2	61.7±10.6	.611
Height (cm)	160.6±9.1	160.3±9.2	161.2±8.8	.021

Abbreviations: ARHL, age-related hearing loss; BMI, body mass index.

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This study used data from adults who underwent medical examinations at Boramae Medical Center from January 2011 to December 2021. A total of 22,332 individuals who underwent medical examinations, including hearing tests, were screened. Among them, 2,349 participants were analyzed, excluding those younger than 60, those with missing data, those with a history of occupational noise exposure, those with hearing loss other than ARHL, those with asymmetric hearing loss, and those with central nervous system diseases.

ARHL was defined as a 2 kHz threshold greater than 25 dB in the better ear and a 4 kHz threshold equal to or greater than the 2 kHz threshold in the same ear, which represents a modification of the criteria originally proposed by Sousa, C. S. et al.

Variable selection was performed using the augmented backward elimination (ABE) method, encompassing all potential variables for each sex and employing a significance level of 0.2, with a change-in-estimate threshold of 0.05. Multiple logistic regression analyses were separately performed for each sex, with a significance level set at 0.05.

Résultats

Variables	Male			Female		
	OR	95% CI	*P*-value	OR	95% CI	*P*-value
Age (years)	1.212	1.178–1.250	< .001	1.200	1.167–1.236	< .001
Hypertension				1.237	0.906–1.684	.179
Diabetes				1.367	0.854–2.166	.187
BMI						
Normal	Reference			Reference		
Underweight	3.020	1.350–7.311	.010	0.995	0.412–2.309	.990
Obesity	0.920	0.694–1.218	.561	2.102	1.315–3.434	.002
Smoking						
Never	Reference			Reference		
Former	1.066	0.770–1.480	.700			
Current	1.953	1.342–2.854	.001			
Weight (kg)				0.953	0.921–0.983	.004
Height (cm)	0.977	0.953–1.000	.054	1.016	0.990–1.051	.179
Age at menarche (years)				1.119	1.033–1.213	.006

Abbreviations: OR, odds ratio; CI, confidence interval; BMI, body mass index.

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Conclusion

Specific associated factors for ARHL in **males** include **underweight and smoking**. Specific associated factors for ARHL in **females** include **obesity, low weight, and late menarche**. Assessment and counseling regarding smoking, obstetric history, underweight, and obesity may be helpful in the management of patients with ARHL.

Références

Sousa CS, Castro Junior N, Larsson EJ, Ching TH. Risk factors for presbycusis in a socio-economic middle-class sample. Braz J Otorhinolaryngol. 2009; 75(4):530–6. https://doi.org/10.1016/S1808-8694 (15)30492-4 PMID: 19784422

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