SPEECH DISCRIMINATION DISCREPANCY IN BILATERAL SYMMETRIC VERSUS ASYMMETRIC SENSORINEURAL HEARING LOSS

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INTRODUCTION

The degree of hearing loss in both ears is seldom identical in bilateral sensorineural hearing loss. However, there must be a minimum of 15 dB HL difference at three consecutive frequencies between both ears for a bilateral hearing loss to be classified as asymmetric.

Patients with ASNHL rely more on their better-hearing ears. Due to the emphasis on the better-hearing ear of ASNHL patients, the impact of their worse-hearing ear on speech discrimination abilities was not given significant consideration. Therefore, the long-term effects of ASNHL on speech discrimination abilities must be explored.

The rationale of this study is to answer the following research question "Do symmetric and asymmetric sensorineural hearing loss have different effects on speech discrimination abilities?".

ASNHL: Asymmetric Sensorineural Hearing Loss.

SSNHL: Symmetrical Sensorineural Hearing Loss.

AIM OF THE WORK

The aim of this study was to find out the effect of asymmetric and symmetric sensorineural hearing loss on speech discrimination abilities.

PATIENTS AND METHODS

The study included 36 adult patients with bilateral sensorineural hearing loss, divided into ASNHL (n=18) and SSNHL (n=18) groups. Patients had no conductive or mixed hearing loss, no history of hearing aids or ear surgery, and no pre- or perilingual hearing loss. Those with abnormal results on MRI indicating retro-cochlear lesions were excluded.

Pure tone audiometry assessed hearing loss degree, categorizing patients based on hearing loss symmetry into SSNHL (RL-gap < 15 dB HL) and ASNHL (RL-gap ≥ 15 dB HL) groups. Speech audiometry was done to detect the SDS in quiet using Arabic phonetically balanced monosyllabic words.

To analyze the impact of RL-gap on SDS, we compared ASNHL better-hearing ears with mild and moderate SSNHL patients, and ASNHL worse-hearing ears with moderate and moderately severe SSNHL patients.

RL-gap: The difference between the right and left ears PTA
SDS: Speech Discrimination Score
PTA: The Three-Frequency Pure Tone Average

RESULTS

Table 1: Comparison between the SSNHL and ASNHL patient groups according to their gender and age.

	SSNHL Patients (n=18)		ASNHL Patients (n=18)		Total (n=36)		Test of sig.	p-value
Gender	**Number**	**%**	**Number**	**%**	**Number**	**%**		
Male	9	50	9	50	18	50	X^2= .000	1
Female	9	50	9	50	18	50		
Age (years)								
Min. – Max.	41 – 70		40 – 68		40 – 70		**U-value**	.628
Mean ± SD.	53.78 ± 8.90		54.83 ± 9.54		54.31 ± 9.12		= 177.50	
Median	53		55		54			

Values are indicated as minimum, maximum, mean ± standard deviation, and median.

χ^2 and p values for the Chi-square test for comparing between the two groups.

U and p values for the Mann-Whitney U test for comparing between two groups.

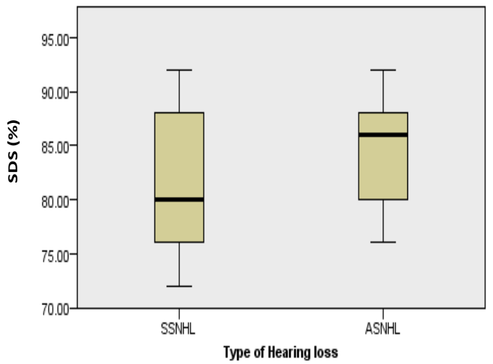

Figure 1: Simple boxplot of SDS (%) of mild and moderate SSNHL ears, and ASNHL better-hearing ears.

Table 2: Correlation of SDS with RL-gap in SSNHL and ASNHL Ears.

SDS (%)	RL-gap (dB HL)		
	SSNHL Ears (n = 36)	ASNHL	
		Better-hearing Ears (n = 18)	Worse-hearing Ears (n = 18)
Correlation Coefficient	.17	.22	-.74***
p-value	.314	.374	<.0001***

Note. ***Correlation is statistically significant at the level of .0001 level.

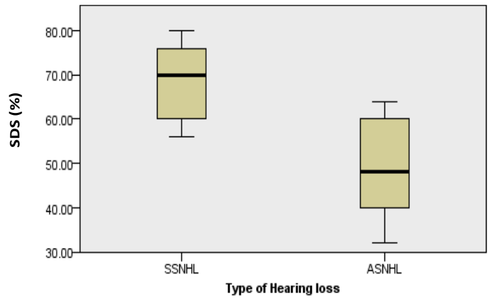

Figure 2: Simple boxplot of SDS (%) of moderate and moderately severe SSNHL ears, and ASNHL worse-hearing ears.

CONCLUSIONS

- ASNHL patients' worse-hearing ears have lower speech discrimination scores than SSNHL patients with comparable hearing loss degrees due to auditory deprivation and diminished utilization, especially with increased RL-gap.
- Binaural amplification is recommended for ASNHL patients to reduce the consequences of asymmetry hearing loss and decrease the effect of auditory deprivation.