

The whispered voice: The best test for screening for hearing impairment in general practice?

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SUMMARY

Hearing loss is an important health problem in the elderly which sometimes leads to social isolation. In a study with 62 patients, the diagnostic value of four simple tests for screening for hearing loss in general practice was examined. When paying attention to the loudness of the whispering, the whispered voice test can be a valuable test for assessment of hearing loss in general practice.

Keywords: hearing loss; elderly patients; whispered voice test.

Introduction

Hearing loss of 35 dB and over is a common health problem in the elderly that can lead to social isolation. In the UK, general practitioners have been obliged to screen the elderly for hearing loss since the 1990 National Health Service contract. While its diagnostic value is still in debate, the Royal College of General Practitioners has chosen the whispered voice as the first test for hearing loss.¹ In the Netherlands, general practitioners also need a simple method to identify elderly people with hearing loss. The principal aim of this study was to investigate the diagnostic value of the whispered voice test.

Method

The diagnostic value of the whispered voice test was investigated (1) by comparing its sensitivity and specificity to other simple diagnostic tests, using the audiogram as a reference standard, and (2) by examining the interobserver reliability of the whispered voice.² The results of six other examiners with the whispered voice were compared with the results of the first examiner and expressed by means of sensitivity/specificity and Cohen's

Kappa.

In a period of 6 weeks, all patients aged 55 years and over, attending an outpatient ENT department for an audiogram were studied. Patients using a hearing aid were excluded. The tests were performed in a consulting room where the amount of extraneous noise was comparable to general practice.

The pure-tone thresholds of the reference test were assessed with an ENT audiometer using a standard method.³ Because we performed the four tests in the way they were originally validated, the four tests had different screening levels. Therefore, we compared the results with the same level at the reference test:

- (1) The whispered voice was performed by a standard method (slightly modified).⁴ Inability to repeat two or more combinations correctly was regarded as a hearing loss of more than 30 dB. The test was performed for a second time by six other examiners.
- (2) The Pat-225 involves pushing a button to produce a mixed noise (from approximately 500 to 4000 Hz) of 30 dB, and it has to be held 25 cm from the test ear. The test was positive when the noise was heard.
- (3) The Audioscope-3 is an auroscope with a built-in audiometric screening device.⁵ Patients who did not hear all four tones were considered to have a hearing loss of more than 40 dB.
- (4) A screening audiometer (Micromate-304) was limited to use at 2000 and 4000 Hz at 40 dB, which can be performed within 3 min. Patients passed if they could hear both tones.

Results

Out of 62 patients, 124 ears were studied. Because there was only a low correlation between the results of the two ears of the same subject (Pearson's R 0.18), we treated the ears as independent.

According to the reference test of the ENT audiometer, 73 out of the 124 ears had a hearing loss of >30 dB and 41 had a hearing loss of >40 dB.

According to the whispered voice test, 76 ears had a hearing loss of >30 dB: sensitivity and specificity were 90% (66/73, 95% CI 84–97) and 80% (41/51, 95% CI 69–91). With the Madsen Pat 225, 88 ears had a hearing loss of >30 dB: the sensitivity and specificity of this test were 88% (64/73, 95% CI 80–95) and 53% (27/51, 95% CI 39–66). With the Audioscope-3, 89 ears had a hearing loss of >40 dB: the sensitivity and specificity were 100% (41/41) and 42% (35/83, 95% CI 32–57). Using the screening audiometer, 92 ears had a hearing loss of >40 dB: sensitivity and specificity were 100% (41/41) and 39% (32/83, 95% CI 28–49).

Among the six other examiners with the whispered voice, the sensitivity varied from 93 to 100%, the specificity from 14 to 100% and Cohen's kappa from 0.16 to 1.0 (Table 1).

Discussion

The whispered voice is the best among the available simple tests to identify people with hearing loss in general practice with respect to sensitivity and specificity. However, there was a broad

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Table 1. Sensitivity and specificity of the whispered voice test by examiners 2 to 7, and the inter-observer reliability when compared with examiner 1 (Cohen's Kappa).

	Examiner					
	2	3	4	5	6	7
Ears <30 dB (n/total)	1/32	16/24	19/36	11/16	8/12	3/4
Sensitivity/ specificity	100/29	93/56	100/42	100/14	100/80	100/100
Examiner 1** (Kappa)	0.31	0.52	0.42	0.16	0.82	1.0

*With the reference test. **Examiner 1: sensitivity, 80; specificity, 80; $n = 124$.

variation between outcomes of the examiners. A possible explanation is the difference in loudness of the whispering. It might be that examiners 6 and 7 whispered too loudly, indicated by a low sensitivity and a high specificity. However, because examiners 2 to 5 all had a high sensitivity and a low specificity, we assume that they all whispered too quietly. This conclusion is supported by some patients who spontaneously complained about the very quiet whispering of examiners 2 and 5. While performing the whispered voice test, one should pay attention to the loudness of the whispering.

In the RCGP guidelines for the annual screening of the elderly for assessing hearing loss, the choice was made in favour of the whispered voice on pragmatic grounds.¹ Although we had a small sample size, we can draw the conclusion that the whispered voice is an appropriate test to objectify hearing loss in general practice, especially when we included the purchasing costs of the different tests (whispered voice = 0, Madsen Pat-225 = £83, Welch-Allyn Audioscope-3 = £491 and Madsen Micromate-304 = £893). Taking these limitations into account, the whispered voice can be a valuable test for assessment of hearing loss by the general practitioner.

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