

Impact of tinnitus on the quality of life among Saudi patients

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ABSTRACT

الأهداف: تقييم تأثير الطنين على حياة المرضى السعوديين، ومقارنة ذلك بدراسات مماثلة.

الطريقة: أُجريت هذه الدراسة الاسترجاعية في عيادة أمراض الأذن، مستشفى الملك عبدالعزيز الجامعي، الرياض، المملكة العربية السعودية حيث قمنا بمراجعة السجلات الخاصة بمائة مريض مصاب بالطنين خلال الفترة من يناير 2008م إلى ديسمبر 2010م. لقد قمنا باستخدام استبيان مقياس الإعاقة الناتجة عن الطنين والمكون من 25 بند، بالإضافة إلى بعض المعلومات الأخرى والتي تشمل العمر، والجنس، وضعف السمع، ومدة الشكوى، والأعراض، وتناظر أو عدم تناظر المرض.

النتائج: شملت الدراسة 54 ذكر، و46 أنثى ممن بلغ متوسط أعمارهم 47.1 ± 13.1 عاماً. لقد وُجد بأن الذكور قد حصلوا على مقياس إعاقة أعلى من الإناث وخصوصاً في مجال القياس الانفعالي والوظيفي. لقد عانى 76% من ضعف سمعي مصاحب للطنين. وحصل المرضى الذين يعانون من طول مدة الشكوى على درجات عالية في القياس الانفعالي ($p=0.009$)، وقياس شدة أزمة المرض ($p=0.006$) وذلك بالمقارنة مع المرضى الذين كانت مدة شكواهم أقصر. لقد كان تعرض المرضى الذكور لدرجات عالية في قياس شدة أزمة المرض أعلى بمقدار 3.15 من الإناث. كما أثر مصاحبة ضعف السمع لمدة طويلة من الشكوى على درجات قياس شدة أزمة المرض عن باقي المقاييس الأخرى، وحصل 51% من المرضى على الدرجة الرابعة في مقياس الإعاقة الناتجة عن الطنين.

خاتمة: أظهرت هذه الدراسة مدى تأثير الطنين على حياة المرضى السعوديين ولا يوجد في الوقت الحاضر تصور وخطة للتعامل مع حالات الطنين في معظم عيادات الأنف والأذن والحنجرة في المملكة العربية السعودية. ونرى بناء على هذه الدراسة أن مقياس الإعاقة الناتجة عن الطنين ذو فائدة كبيرة أثناء الكشف عن المرض، ومتابعته، ومعاينة مدى الحاجة للتدخل العلاجي.

Objectives: To assess the impact of tinnitus on the quality of life of Saudi patients, and to compare the findings with those of other studies.

Methods: A retrospective chart review of 100 tinnitus patients, who visited the Otology/Neurotology Clinic at

King Abdulaziz University Hospital, Riyadh, Kingdom of Saudi Arabia between January 2008 and December 2010, and completed the 25-item Tinnitus Handicap Inventory (THI), was conducted. Age, gender, duration of symptoms, laterality, and associated hearing loss were included in the data.

Results: The mean age of 54 men, and 46 women was 47.1 ± 13.1 years. The male patients had higher THI total scores, emotional and functional total subscale scores as compared with the female patients. Associated hearing loss was present in 76% of patients. Patients with a long duration of tinnitus had a significantly higher scoring of the emotional ($p=0.009$), and catastrophic total subscale scores ($p=0.006$) compared with those with a short duration. The risk of a male patient experiencing a catastrophic score was 3.15 times higher than that in a female patient. Associated hearing loss, and tinnitus over a long duration affected the catastrophic subscale scores more than the other subscales. Fifty-one percent of the patients were grade 4 in the THI.

Conclusion: Tinnitus had a negative impact on the quality of life of Saudi patients. The THI may be a useful tool for screening patients, counseling, and charting treatment progress.

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Tinnitus is a problem that affects millions of people worldwide, but remains poorly understood. In one study, the prevalence of tinnitus was found to be 8.2%.¹ Although the prevalence of tinnitus in Saudi Arabia is unknown, it may be quite high because the majority of workers in noisy environments take no precautions to protect their hearing. Currently, no general agreement has been reached on the definition of tinnitus. In addition, no objective test for the detection of tinnitus has been developed. Tinnitus is primarily a subjective and “unobservable” symptom.² Clinical experience shows that patients’ perception of tinnitus is variable.³ However, the condition can cause marked psychological distress, and can have severe effects on daily functioning.^{3,4} Nonetheless, no consensus has been established to determine when this condition represents a handicap, as objective measurement is very difficult.⁵

A number of studies have been performed to assess the impact of tinnitus on the quality of life of sufferers, but no such studies have been conducted in Saudi Arabia. Since people react differently to life events, including sickness, and this study aimed to assess the impact of tinnitus on the quality of life of Saudi patients, and to compare the findings with those of similar studies.

Methods. The Tinnitus Handicap Inventory (THI) was translated into the Arabic language by 2 independent otolaryngologists. Then 2 bilingual speakers unfamiliar with the THI translated this Arabic version back into English in order to compare the original document with the Arabic version. A fairly close match in terms of content and meaning was found. The reliability of the questionnaires was estimated using Cronbach’s alpha. It equals 0.83 (values more than 0.7 are considered reliable), however, the Arabic version was not tested. Between January 2008 and December 2010, a retrospective study of 100 tinnitus patients who visited the Otolaryngology/Neurotology Clinic at King Abdulaziz University Hospital, Riyadh, Kingdom of Saudi Arabia with tinnitus as the main complaint was conducted. The patients were asked to complete the questionnaires as a component of the tinnitus evaluation, management and counseling. Charts with incomplete data were excluded. The data included 25 items in the THI. The THI is a self-administered 25-item questionnaire that is scored on a 3-point Likert Scale (no = 0, sometimes = 2, and yes = 4), and 3 subscales: emotional, functional, and catastrophic. The age, gender, laterality, duration of symptoms (≤ 5 years, and > 5 years), and associated hearing loss were also included in the data. Based on the THI total scores, tinnitus sufferers were classified into 5 categories denoting handicap severity: no handicap grade 1 (0–16), mild handicap grade 2 (18–36), moderate handicap grade 3 (38–56), severe handicap

grade 4 (58–76), and catastrophic handicap grade 5 (78–100). The study was approved by the institutional review board at the Faculty of Medicine, King Saud University, Riyadh, Kingdom of Saudi Arabia, and performed in accordance with the principles of the Helsinki Declaration. Furthermore, written informed consent was obtained from all the participants in this study.

The prevalence of various characteristics in the study sample was investigated through the computation of percentages. The means of 2 independent groups were compared using the Mann-Whitney test. A p-value less than 0.05 indicates statistical significance. Odds ratios, and their corresponding 95% confidence intervals (CI) were computed to investigate the estimate of the relative risks between 2 study groups. A 95% CI that did not include a value of 1.0 indicates statistical significance. The Statistical Package for Social Sciences version 15 (SPSS Inc., Chicago, IL, USA), and StatsDirect (StatsDirect Ltd, Altrincham, United Kingdom) statistical programs were used for the statistical analysis.

Results. The study included 100 patients; 54 males (54%), and 46 females (46%). The mean age of the patients was 47.1 ± 13.1 years. The mean duration of symptoms was 4.8 ± 2.9 years. Forty-three patients (43%) had tinnitus in both ears, while the rest (57%) had unilateral disease. Moreover, hearing loss occurred in 76 patients (76%). The percentages of the patients who answered “yes” for each item in the THI questionnaire is presented in Table 1. The highest percentages of “yes” responses were for item E25 “Does your tinnitus make you feel insecure?” from the emotional subscale; item F24 “Does your tinnitus get worse when you are under stress?” from the functional subscale; and item C23 “Do you feel that you can no longer cope with your tinnitus?” from the catastrophic subscale. The comparison of the THI, and subscale total scores by gender, associated hearing loss, laterality, and duration of complaints is presented in Table 2. With regard to gender, male patients tended to have significantly higher mean levels of the THI total scores ($p=0.001$), emotional subscale total scores ($p=0.001$), and functional subscale total scores ($p=0.001$) compared with female patients. A similar phenomenon was observed between male and female patients with regard to the total scores of associated hearing loss. The male patients show significantly higher mean levels than female patients with regard to the THI total scores ($p=0.021$), emotional subscale total scores ($p=0.012$), and functional subscale total scores ($p=0.019$). A long duration (> 5 years) of complaints was associated with significantly higher mean levels (< 5 years) of the emotional subscale total scores ($p=0.009$), and the catastrophic subscale total scores ($p=0.006$) in

comparison with the shorter duration of complaints. We investigated the estimate of the relative risks associated with experiencing a catastrophic score of 58-76 or 78-100 with respect to gender, hearing loss, laterality, and duration of follow-up (Table 3). The risk of a male patient experiencing a catastrophic score was 3.15 times higher than that of a female patient. The catastrophic scores were positively associated with the

hearing loss. The long duration of tinnitus complaints (>5 years) was positively associated with experiencing a catastrophic score. The predictor variables of hearing loss are presented in Table 4. Male gender, bilateral disease involvement (OR=3.8; 95% CI=1.19–14.2), and long duration of tinnitus complaints (>5 years) were significantly associated with the incidence of hearing loss. The percentages of patients for each THI

Table 1 - Percentage of tinnitus patients who answered, "yes" for each questionnaire item.

Item	Percentages of patients who answered "yes"
<i>Emotional subscales</i>	
E3. Does your tinnitus make you angry?	47
E6. Do you complain a great deal about your tinnitus?	50
E10. Because of your tinnitus, do you feel frustrated?	47
E14. Because of your tinnitus, do you find that you are often irritable?	46
E16. Does your tinnitus make you upset?	46
E17. Do you feel that your tinnitus problem has placed stress on your relationships?	49
E21. Because of your tinnitus, do you feel depressed?	46
E22. Does your tinnitus make you feel anxious?	60
E25. Does your tinnitus make you feel insecure?	62
<i>Functional subscales</i>	
F1. Because of your tinnitus, is it difficult for you to concentrate?	39
F2. Does the loudness of your tinnitus make it difficult for you to hear people?	51
F4. Does your tinnitus make you feel confused?	49
F7. Because of your tinnitus, do you have trouble falling asleep at night?	16
F9. Does your tinnitus interfere with your ability to enjoy social activities?	46
F12. Does your tinnitus make it difficult for you to enjoy life?	52
F13. Does your tinnitus interfere with your job, or household responsibilities?	46
F15. Because of your tinnitus, is it difficult for you to read?	44
F18. Do you find it difficult to focus your attention away from your tinnitus, and other things?	46
F20. Because of your tinnitus, do you often feel tired?	51
F24. Does your tinnitus get worse when you are under stress?	58
<i>Catastrophic subscales</i>	
C5. Because of your tinnitus, do you feel desperate?	41
C8. Do you feel as though you cannot escape your tinnitus?	50
C11. Because of your tinnitus, do you feel that you have a terrible disease?	51
C19. Do you feel that you have no control over your tinnitus?	56
C23. Do you feel that you can no longer cope with your tinnitus?	58

Table 2 - Comparisons of the total scores of the Tinnitus Handicap Inventory (THI), emotional, functional, and catastrophic subscales by gender, presence of hearing loss, bilaterally, and duration of complaints among the studied Saudi patients.

Variables	THI total score (Mean± SD)	Emotional total subscale score (Mean± SD)	Functional total subscale score (Mean± SD)	Catastrophic total subscale score
<i>Gender</i>				
Male (n=54)	67.1±11.5	25.4±4.0	28.1±6.0	13.6±4.0
female (n=46)	56.5±15.4	21.0±6.2	23.2±8.7	12.3±3.4
<i>P</i> -value	0.001*	<0.001*	<0.001*	0.152
<i>Hearing loss</i>				
Yes (n=76)	64.1±13.7	24.1±5.5	26.8±7.6	13.3±3.7
No (n=24)	56.2±15.4	21.2±5.3	22.8±7.4	12.3±4.1
<i>P</i> -value	0.021*	0.012*	0.019*	0.440
<i>Laterality</i>				
Unilateral (n=57)	60.8±14.2	22.8±5.0	25.4±8.0	12.6±3.9
Bilateral (n=43)	64.0±14.7	24.1±6.3	26.3±7.4	13.6±3.6
<i>P</i> -value	0.220	0.160	0.695	0.143
<i>Duration of complaints</i>				
≤5 years (n=73)	60.5±14.8	22.6±5.8	25.4±7.8	12.5±4.0
>5 years (n=27)	67.0±12.4	25.4±4.2	27.0±7.5	14.5±2.6
<i>P</i> -value	0.069	0.009*	0.503	0.006*

*Statistically significant at 5% level of significance

Table 3 - Prevalence of severe or catastrophic THI total scores in relation to gender, laterality, hearing loss, and duration of symptoms among Saudi tinnitus patients.

Variable	THI severe (58-76) or catastrophic (78-100) score n (%)	Odds ratio	95% confidence interval
Gender		3.15	1.25-8.10
Male (n=54)	41 (75.9)	-	
Female (n=46)	23 (50.0)		
P-value	0.013*		
Hearing loss		1.37	0.47-3.86
Yes (n=76)	50 (65.8)	-	
No (n=24)	14 (58.3)		
P-value	0.675		
Laterality		1.30	0.53-3.27
Unilateral (n=57)	29 (67.4)	-	
Bilateral (n=43)	35 (61.4)		
P-value	0.680		
Duration of complaints		2.44	0.82-8.23
>5 years (n=27)	21 (77.8)	-	
≤5 years (n=73)	43 (58.9)		
P-value	0.131		

*Statistically significant at 5% level of significance

grade were as follows: 4% of patients were grade 2; 32% were grade 3; 51% were grade 4; and 13 % were grade 5 with the greatest negative impact.

Discussion. In this study, we found a slight predominance of tinnitus in males compared with females, comparable to another study.⁶ Another study found the prevalence of tinnitus to be similar in both genders.⁴ The male patients in our study had worse THI total scores, emotional, and functional total subscale scores regarding associated hearing loss. We also found that males had a 3.15 times higher risk of experiencing catastrophic tinnitus than females.

The relationship between tinnitus and hearing loss is variable.⁷ In a small group of tinnitus patients, the hearing thresholds were found to be within normal limits.⁸ However, a recent study conducted in China including 462 tinnitus sufferers reported that 14% of the patients had a "normal audiogram," while 46% experienced hearing loss in high frequency range.⁹ The mean age of our study group was younger than that of another study.¹⁰ We found that the total THI, functional, and emotional total subscales were significantly higher in patients with associated hearing loss compared to those with no hearing loss. Another study found no significant differences between those with normal hearing, and those with hearing loss in terms of the handicap scores, especially with regard to the degree of handicap severity.¹¹ We found that a long duration of tinnitus significantly affected the quality of

Table 4 - Predictor variables of hearing loss among 76 patients.

Variable	Hearing loss Yes (n=76) n (%)	Odds ratio	95% confidence interval
Gender		3.07	1.07-9.28
Male (n=54)	46 (85.2)	-	
Female (n=46)	30 (65.2)		
P-value	0.036*		
Laterality		3.8	1.19-14.2
Bilateral (n=43)	38 (88.4)	-	
Unilateral (n=57)	38 (66.7)		
P-value	0.023*		
Duration of complaints		5.39	1.15-50.3
>5 years (n=27)			
≤5 years (n=73)	25 (92.6)		
P-value	51 (69.9)	0.036*	
Severe (58-76) or catastrophic (78-100) THI grade score		1.37	0.47-3.86
Yes (n=64)	50 (78.1)		
No (n=36)	26 (72.2)		
P-value	0.675		

*Statistically significant at 5% level of significance

life, as shown by the low scores of both emotional, and catastrophic subscales.

The majority of patients in the study group were grade 4, which indicates a severe handicap from tinnitus, while other studies^{10,11} have shown that the majority of tinnitus patients had no handicap or only a slight handicap. Another study used a Visual Analog Acale to assess the patients, and did not find a correlation between hearing impairment and the degree of disturbance that these patients felt with regard to their tinnitus.¹² In our study, a possible reason for the high percentage of grade 4 patients is that most patients (76%) had an associated hearing loss, which is an additional handicap that affects the quality of life.

The main limitation of the study is that the THI total scores are the only data set for these patients, in addition to the socio-demographic variables, occupation, level of education, and residency.

In conclusion, the negative impact of tinnitus on the quality of life of Saudi patients was evident from this study. At present, no guidelines have been developed for the management of tinnitus in most otolaryngology clinics in our country. The THI may be a useful screening tool for this purpose, and repeated THI assessments can potentially be used to chart the progress of the treatment for further studies.

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Ethical Consent

All manuscripts reporting the results of experimental investigations involving human subjects should include a statement confirming that informed consent was obtained from each subject or subject's guardian, after receiving approval of the experimental protocol by a local human ethics committee, or institutional review board. When reporting experiments on animals, authors should indicate whether the institutional and national guide for the care and use of laboratory animals was followed.