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Original article

First assessment of sophrology for the treatment of subjective tinnitus

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ABSTRACT

Objectives: To assess (without comparison versus controls) the efficacy of a sophrology protocol adapted to disabling subjective tinnitus, in diminishing the handicap induced by perception of tinnitus.

Materials and methods: One hundred and forty consecutive patients, aged 18–83 years, underwent a protocol comprising 6–8 sessions of sophrology over a 2–4 month period. Impact was assessed on pre- to post-treatment progression on the Tinnitus Handicap Inventory (THI), a validated questionnaire measuring handicap induced by tinnitus.

Results: Mean THI scores improved, by > 20 points in 59.2% of cases (i.e., clinically significant decrease). Improvement was independent of tinnitus duration (> versus < 6 months) and origin (acoustic trauma versus emotional shock), and concerned all 3 THI subscales (functional, catastrophic and emotional).

Conclusion: The present sophrology protocol, dedicated to subjective tinnitus, reduced intrusiveness. Further studies with a control group are needed to confirm efficacy as compared to waiting list or other validated treatments such as cognitive behavioral therapies.

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1. Introduction

Subjective tinnitus is defined as an auditory percept arising without internal or external acoustic stimulus. Its subjective status implies that it is perceived only by the subject, and is not recordable [1]. The nature and frequency of the sounds perceived varies greatly, but they are usually reported as being elementary: whistling, buzzing or crackling. Tinnitus may be permanent or intermittent, unilateral (in either ear) or bilateral, or else within the head. Intensity may vary, increasing in calm environments or after stress [2]. Several epidemiological studies, in both developed and developing countries, reported tinnitus to affect 10% to 15% of the adult population, with prevalence increasing with age [3]. Onset may be sudden, following acoustic trauma, for example, or gradual. It is generally accompanied by hearing loss [4]. It should be borne in mind that “tinnitus” refers to a symptom, and that the exact nature of the complex pathophysiological mechanisms underlying onset and maintenance are poorly understood [5]. There is usually a peripheral cause (hearing loss), but tinnitus represents an abnormal cerebral plastic adaptation responsible for chronicization [6] [7].

Repercussions in personal and occupational life can be severe in some cases, and a variety of treatment approaches have been proposed to reduce tinnitus intensity and psychosocial impact [8].

Numerous pharmacological treatments have been reported: antidepressants (tricyclic, or serotonin-reuptake inhibitors), benzodiazepines, antiepileptics or glucocorticoids in the acute phase, but without evidence of significant efficacy in large-scale studies [9]. Assuming tinnitus to be associated with changes in central nervous system activity, several treatment methods have been proposed based on neuromodulation by acoustic stimulation [10], transcranial magnetic stimulation or biofeedback techniques [11]. Here again, however, results showed poor reproducibility. Most other proposed treatments therefore involve a behavioral approach, with psychological therapy and information [12]. Providing patients with explanations of the origins of their symptoms and susceptibility to mood, and of the benign nature of idiopathic tinnitus, can sometimes be enough to give reassurance and allow them to cope more serenely. Thus, in Tinnitus Retraining Therapy (TRT), acoustic modulation via a hearing aid to reduce tinnitus perception and impact is always accompanied by information and counselling [13]. Cognitive behavioral therapies (CBT) seek to modify maladapted reflex responses at the cognitive, emotional and behavioral levels by introducing strategies notably aiming at drawing the patient's attention away from the perception of tinnitus [14].

Sophrology, developed some 60 years ago by the Colombian psychiatrist A Caycedo, is a psychosomatic approach seeking to treat

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Table 1
Patient data.

Number of patients	Female 81 (57.9%) Male 59 (42.1%)
Age (18–83 years)	Female 50.7 ± 15.2 Male 49.8 ± 14
Perception of tinnitus	> 6 months: 90 (64.3%) < 6 months: 49 (35.0%)
Sleep disorder	Yes: 86 (61.4%) No: 54 (38.6%)
Hearing loss	Yes: 69 (42.3%) No: 61 (57.7%)
Hearing aid	Yes: 24 (17.6%) No: 112 (82.4%)
Diagnosed hyperacusis	Yes: 22 (16.2%) No: 114 (83.8%)
Dizziness	Yes/sometimes: 31(22.6%) No: 106 (77.4%)

the patient holistically rather than exclusively at symptom level. It associates controlled breathing, dynamic relaxation and mental imaging to enhance coping with anxiogenic situations. Such physical and mental preparation is widely used for elite athletes, for preparing examinations or as adjuvant for pain treatment [15] in childbirth [16] and oncologic chemotherapy [17]. There are, however, no reported studies of efficacy in tinnitus.

The present study therefore sought to assess the effect of a sophrology protocol dedicated to tinnitus on the level of disability of patients with subjective tinnitus.

2. Material and methods

Following a preliminary retrospective study [18] suggesting benefit for sophrologic management adapted to tinnitus, between February 2016 and May 2017 17 French and Swiss sophrologists belonging to the *Pôle Sophrologie et Acouphènes* network, implemented the same protocol in 140 subjective tinnitus patients. All subjects presenting for tinnitus treatment were included, except: those with pre-treatment THI score < 15 (i.e., tinnitus with almost no socio-occupational impact and generally showing spontaneous resolution); those with tinnitus associated with Menière’s disease or progressive vestibular pathology; those with severe hearing loss impairing oral communication; and those with a psychological state requiring complementary management (e.g., severe depression). Given the recruitment pathway, more than 90% of subjects had already consulted an ENT specialist or family doctor before the sophrologist; consultations were planned for those who had not. Patients continued with any treatment, notably pharmacologic, already prescribed. Table 1 shows population data.

Intrusiveness in daily life was assessed on the self-administered Tinnitus Handicap Inventory (THI) developed by Newman et al. [19] and translated into French and validated by Ghuilyan-Bedikian et al. [20]. This questionnaire comprises 25 questions exploring 3 categories of handicap: functional, emotional and catastrophic. Response options are “yes” (4 points), “sometimes” (2 points) or “no” (0 point). Scores distinguish 5 levels of handicap (see Table 2). The THI was filled out at the beginning of treatment, at initial history-taking, and end of treatment, so as to assess effects.

The sophrology protocol comprised 3 phases (see Box 1), based on previously reported contents [18]. Phase 1, forging the therapeutic alliance, included history-taking to collect clinical data, assess severity (on THI), communicate consensus explanations of the symptom, and set treatment objectives. The patient learns that it is possible to acquire reflexes of relaxation with respect to the perception of tinnitus. Phase 2 targets symptoms, raising awareness of the acoustic environment, including tinnitus. The sophrologist guides the patient into a state of deep muscular and mental relaxation and of detachment from the parasite noise. Phase 3 involves progressive

Table 2
THI score and perceived handicap severity.

Score	Nature du Handicap
0–16	Slight (Only heard in quiet environments)
18–36	Mild (Easily masked by environmental sounds and easily forgotten with activities)
38–56	Moderate (Noticed in presence of background noise, although daily activities can still be performed)
58–76	Severe (Almost always heard, leads to disturbed sleep patterns and can interfere with daily activities)
78–100	Catastrophic (Always heard, disturbed sleep patterns, difficulty with any activities)

Box 1: Phases of the specific tinnitus sophrology protocol (6–8 sessions)

Phase 1: sessions 1 and 2–discovering relaxation reflexes in acute episodes
 At the end of this phase, the subject can:
 Breathe more consciously
 Be away of tensions in the body and relax
 Integrate the parasite noise within the acoustic environment
 Feel stable when standing (notably in case of dizziness)
 Take mini-breaks during the working day and at home in the evening.
 Techniques: breathing techniques, dynamic relaxation technique, flash relaxation or basic sophronization
 Phase 2: sessions 3 and 4–symptom management
 At the end of this phase, the subject can:
 Use relaxation techniques in case of stress and acute tinnitus episodes
 Release body tension (shoulders, back, jaw, etc.)
 Live more pleasantly with the 5 senses, including hearing
 Have conscious and reflex respiration to unfocus symptoms.
 Techniques: Breathing techniques, dynamic relaxation, sophro-negative displacement, sophro-positivity presence, sophro-synchronised breathing, sleep sophro-liminal protection
 Phase 3: 2 to 4 sessions-habituation and autonomy
 In this phase, the subject becomes able to:
 Take a distance from parasite noise
 Call up an image cue to feel calmer
 Release tensions by breathing and a keyword (calm, cool, zen) in acute episodes
 Deploy relaxation reflexes in daily life
 Envisage a more serene future, even with tinnitus.
 Techniques: breathing techniques, dynamic relaxation, anchoring, sophro-progressive acceptance, simple future exercise

“habituation”: i.e., taking distance from the tinnitus. Guided by the sophrologist’s voice into a transitional state between waking and sleep, the subject learns to replace the negative sensations induced by the tinnitus by neutral or pleasant sensations that can then be associated to a specific cue so as to create a “relaxation reflex”. Here the patient acquires an autonomy enabling them to gradually manage themselves the episodes in which tinnitus becomes intrusive. To meet the objectives of these 3 phases, the protocol uses codified exercises adapted for tinnitus and deploying specific techniques of respiration, dynamic relaxation and mental imaging. Each session ends with a time for the patient to freely express their feelings. The whole module lasts 2–4 months with 6–8 1-hour sessions, varying according to phase and progression to match the patient’s progress. Results were reported as mean ± standard deviation, with statistical comparison on Student t test, either simple or for matched data. 216 subjects had the initial interview, but only 140 completed the

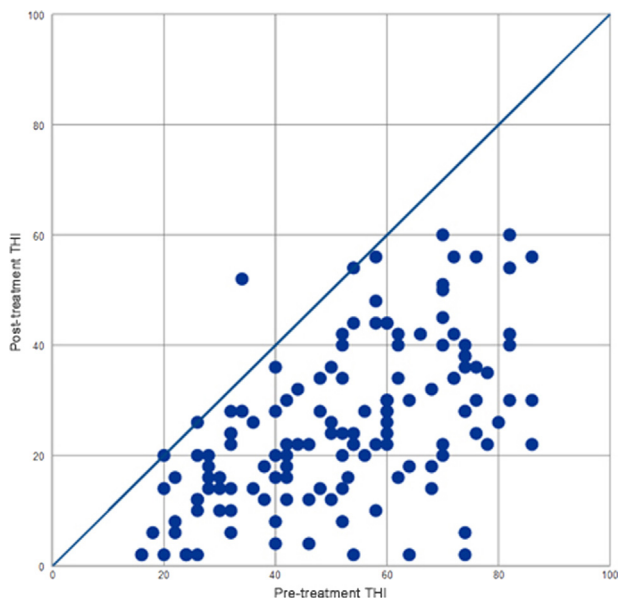


Fig. 1. Impact of sophrologic treatment on THI score in 140 subjective tinnitus patients.

full cycle: i.e., 35.1% attrition, or 64.9% of subjects voluntarily completing the sophrology protocol. Subscores were analyzed for the 89 patients for whom they were available as well as the global THI score.

3. Results

Fig. 1 shows pre- and post-treatment THI scores. These increased (deteriorated) in just 1 case, and were unchanged in 3; otherwise, all THI scores decreased (improved). Mean pre- and post-treatment scores were respectively 51.6 ± 18.8 and 24.8 ± 14.5 , for a mean improvement of 51.9%; the difference was strongly significant on Student test for matched pairs ($P < 0.0001$), and exceeded 20 points in 83 subjects (59.3%), was 10–20 points in 41 (29.3%) and < 10 points in 12 (8.5%). Patient distribution in terms of severity of disability on THI is shown in **Fig. 2**: almost half initially showed moderate, severe or catastrophic handicap (**Fig. 2 A**), with a trend toward lighter handicap at end of treatment (**Fig. 2 B**).

Improvement on THI was independent of tinnitus duration: $53.6 \pm 22.4\%$ ($n = 49$) for duration < 6 months and $51.7 \pm 23.3\%$ ($n = 89$) for > 6 months. Improvement was also independent of etiology; 24 subjects had experienced acoustic trauma and 47 attributed tinnitus to emotional shock, and both groups showed similar benefit: $56.3 \pm 20.4\%$ and $52.8 \pm 24.5\%$, respectively. The THI questionnaire includes 3 categories analyzing functional (F, 11 questions), emotional (E, 9 questions) and catastrophic components (C, 4 questions) of subjective handicap, and benefit was not focused on any one of these in particular: in the 89 subjects for whom pre- and post-treatment subscores were available, benefit was slightly greater in the catastrophic component (C, $58.2 \pm 28.0\%$) than on the emotional (E, $55.8 \pm 26.9\%$) or functional components (F, $52.4 \pm 25.1\%$), but without significant difference.

4. Discussion

The results of the present open multicenter study confirmed the pilot data [18]. THI scores showed improvement of 51%, indicating that specific sophrologic management of tinnitus greatly reduced the level of handicap in subjective tinnitus. Most subjects, and notably those with severe or catastrophic tinnitus, experienced improvement in their quality of life. Benefit was independent of

tinnitus duration (> or < 6 months) and of cause of onset (stress or not), and was similar on all 3 THI subscores, suggesting that it was not solely due to impact on tinnitus-related anxiety and depression, although the present study could not demonstrate this due to the lack of specific psychological assessment. Epidemiologic studies in the general population reported little correlation between tinnitus and psychological pathology, regardless of symptom duration, and severity [21,22]; psychological disorder seemed to be due more to underlying comorbidity than to tinnitus as such [23]. At all events, the present rate of improvement compares favorably with CBT, which is a validated approach in tinnitus [24,25]. One advantage of sophrology is that improvement is obtained relatively quickly, in 6–8 sessions over 2–4 months, whereas TRT, for example, takes about 18 to 24 months to achieve satisfaction [26]. Sophrology, moreover, requires no hearing aid or acoustic masker/generator. The techniques can even so be integrated in global multidisciplinary management, complementing acoustic therapy or more well-established psychotherapies such as CBT. Another interesting point is that the patient can independently intensify application of the techniques learned during the sessions.

Although results were positive, the study had certain limitations.

THI was assessed only at the beginning and end of treatment, and the sustainability of the improvement observed remains unknown. The same subjects would have to be assessed 1 or 2 years after the first treatment cycle, to determine whether the improvement is enduring and whether the respiration, relaxation and imaging techniques remain acquired and able if not to eliminate tinnitus at least to improve tolerance over the long term.

Secondly, the study design was open, without control group. This is true enough, but it would be difficult to define a suitable control: waiting list, information only, or other type of psychotherapy. Cima et al. [25] compared their CBT technique versus “usual care”, without clearly defining the latter. Even so, an open design such as the present cannot rule out a placebo effect, as any treatment at all has beneficial impact simply because the patient feels “cared for”, which can be enough to overcome the handicap [27].

This problem of choosing between clinical study designs was raised in 2012 in an article by a group of clinicians [28], who stressed that a positive results in an open trial need confirming in a randomized controlled trial, preferably in double-blind. This, however, is not very feasible for psychotherapeutic and physiotherapeutic interventions; however, assessment of results (e.g., questionnaire responses) should be confided to independent investigators, which was not the case in the present study. In any such controlled trial, it would also be important to implement assessment at regular time-points so as to take account of tinnitus fluctuation and possible spontaneous resolution. Finally, it would be interesting to include assessment of the auditory characteristics of the tinnitus, using a subjective (numerical or visual analogue) scale or acoustic matching or masking [29].

A further study limitation was that the sample was not selected and was thus heterogeneous. Selection was precluded in order to have a large enough sample in a reasonable time, but resulted in wide variation in age (18 to 83 years), clinical characteristics and medical pathway. Even so, the sample was representative of tinnitus sufferers in terms of age and gender, except that 90% had already consulted in ENT, which is not usually the case in subjective tinnitus. There may also have been a selection bias as only subjects liable to accept a sophrological approach actually encountered it. About a third of subjects did not complete the protocol, whether by non-adhesion to the method or unwillingness to undertake so many sessions (6 to 8) over a fairly long period (up to 4 months). Given that tinnitus is a labile symptom with varied etiology, it is difficult to determine selection criteria for a study or for more homogeneous subgroups [28].

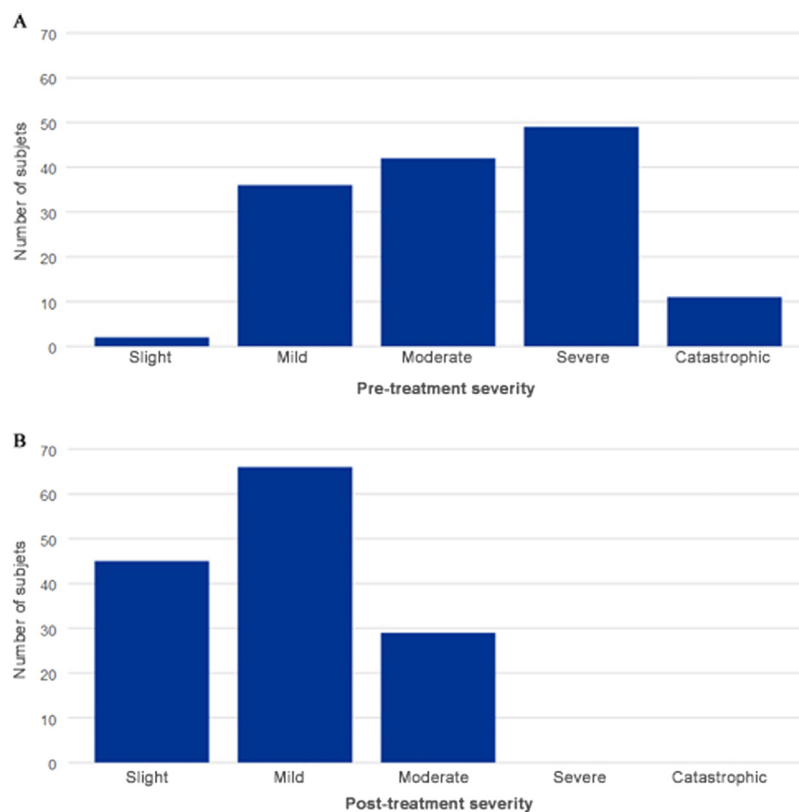


Fig. 2. Progression of handicap severity between start (A) and end (B) of treatment.

Finally, the THI is internationally recognized [30], but is nevertheless a subjective assessment of a subjective symptom that is difficult to quantify. It would be interesting to associate other assessment criteria for treatment efficacy, as other authors have advocated [31]. We would wish for the sophrology method to be assessed on a rigorous scientific basis.

5. Conclusion

The results of the present open study showed that adapted sophrological treatment rapidly decreased handicap and improved quality of life in patients with subjective tinnitus, halving THI scores in most cases. The improvement was also confirmed by patients' reports, collected at beginning and end of treatment. It applied equally to the THI functional, emotional and catastrophic components, and was independent of tinnitus duration and etiology. A larger-scale study with more rigorous design would be useful to confirm the present findings and shed light on the mechanisms involved.

Disclosure of interest

The authors declare that they have no competing interest.

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