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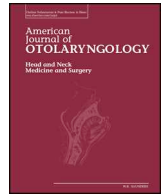
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Am J Otolaryngol

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# Proficiency of virtual follow-up amongst tinnitus patients who underwent intratympanic steroid therapy amidst COVID 19 pandemic

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## ARTICLE INFO

### Keywords:

Virtual  
Video-calling  
Telephonic  
Follow-up  
Intratympanic steroid  
COVID 19  
Tinnitus

## ABSTRACT

**Aim:** The aim of this study was to assess the efficacy and feasibility of virtual follow-up in patients who have undergone intratympanic steroid injection for treatment of tinnitus during COVID-19 pandemic.

**Materials & methods:** Twenty-five patients having long-term tinnitus undergoing intratympanic steroid course, were followed up virtually via video calling & telephonic methods and evaluated using Tinnitus handicap inventory scoring over the period of 68 days.

**Results:** 20 out of 25 patients expressed improvement from symptoms (80%) and 5 of the remaining (20%) showed no improvement.

However, most of them were inarguably satisfied with this virtual method of follow up and had no reservation in following the similar method of observation in future.

**Conclusion:** Virtual follow-up using video calling applications and telephonic call is an efficacious, cost effective and user-friendly method, which can provide accurate post procedural observation while keeping in account the nationwide lockdown during COVID 19 pandemic.

## 1. Introduction

Telemedicine is an evolving and dynamic subset of modern medicine, which facilitates the doctor-patient encounter without the obligation of physical presence [1] [2]. This virtual meet-up helps to overcome barriers such as mobility and distance, which are posing as a predicament during the nationwide lockdown [3]. During the COVID 19 pandemic, we the otorhinolaryngologists, are at an immense risk of exposure to the virus while dealing with the upper airway tract [4,5]. Any contraction of the virus can cost us our own health and even worse the health of our patients that we are catering to [6]. This unprecedented condition called for development of an innovative yet effectual method for following up post procedural patients. Virtual follow-up via Video calls and telephonic calls can provide us a cost effective, patient friendly and most importantly a safer alternative [7]. Thus, ensuring social distancing while providing the patient with utmost care and observation.

We are conducting this study on patients who have undergone Intratympanic steroid injections for the treatment of long-term tinnitus [8]. Tinnitus can be explained as perception of a sound in absence of any actual stimuli in a relatively quiet environment [9]. Various treatment modalities have been put into use to decrease the effects of tinnitus. This Intratympanic injection therapy requires multiple sittings

and regular follow up to closely monitor the progress while detecting any rare complication [10]. Therefore, the much-required follow-up can be ensured on a digital format which is readily accepted by the patients as well. Thus, safety and security of both the doctor and the patient is safeguarded [11].

## 2. Materials & methods

An observational study was conducted for a period of 68 days, from March 23rd to May 31st, encompassing the days of nationwide lockdown in India during COVID 19 pandemic. The study was conducted at Department of ENT, Mahatma Gandhi Medical College & Research Institute, Pondicherry, India. Twenty-five patients who have undergone 2 cycles of intratympanic steroid therapy for the treatment of tinnitus and matched the inclusion criteria were duly followed up once in 2 weeks.

The inclusion criteria comprised of patients who have come to ENT OPD with complaints of unilateral/bilateral tinnitus and have undergone Intratympanic steroid injection two times with no complications observed after the 1st sitting.

Whereas, patients who couldn't be contacted/tracked down, patients with associated profound hearing loss and those with no telephone or mobile phones were excluded from the study.

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<https://doi.org/10.1016/j.amjoto.2020.102680>

Received 17 July 2020

Available online 15 August 2020

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**Table 1.1**  
Tinnitus Handicap Scoring [12,13].

Score		4	0	2
1	Because of your tinnitus, do you have difficulties to concentrate?	Yes	No	Sometimes
2	The volume (intensity) of your tinnitus makes it difficult for you to hear people?	Yes	No	Sometimes
3	Does your tinnitus make you nervous?	Yes	No	Sometimes
4	Does your tinnitus make you confuse?	Yes	No	Sometimes
5	Because of your tinnitus, do you feel hopeless?	Yes	No	Sometimes
6	Do you complain much of your tinnitus?	Yes	No	Sometimes
7	Because of your tinnitus, do you have trouble to start sleeping at night?	Yes	No	Sometimes
8	Do you feel as if you could not get rid of your tinnitus?	Yes	No	Sometimes
9	Does your tinnitus interfere in your capacity to enjoy social activities (such as dinners, going to movies, etc.)?	Yes	No	Sometimes
10	Because of your tinnitus, do you feel frustrated?	Yes	No	Sometimes
11	Because of your tinnitus, do you think you may have some serious disease?	Yes	No	Sometimes
12	Does your tinnitus make it difficult for you to enjoy life?	Yes	No	Sometimes
13	Does your tinnitus interfere in your home or work activities?	Yes	No	Sometimes
14	Because of your tinnitus, do you feel frequently irritated?	Yes	No	Sometimes
15	Because of your tinnitus, do you have difficulties reading?	Yes	No	Sometimes
16	Does your tinnitus make you upset?	Yes	No	Sometimes
17	Do you feel that tinnitus impairs your relationship with family and friends?	Yes	No	Sometimes
18	Do you find it hard to withdraw your attention from the tinnitus and concentrate in something else?	Yes	No	Sometimes
19	Do you feel powerless to control your tinnitus?	Yes	No	Sometimes
20	Because of your tinnitus, do you feel frequently tired?	Yes	No	Sometimes
21	Because of your tinnitus, do you feel frequently depressed?	Yes	No	Sometimes
22	Does your tinnitus make you feel anxious?	Yes	No	Sometimes
23	Do you feel you can no longer withstand your tinnitus?	Yes	No	Sometimes
24	Does your tinnitus get worse when you are stressed?	Yes	No	Sometimes
25	Does your tinnitus make you feel insecure?	Yes	No	Sometimes

Demographic profile including name, phone number and address were acquired from hospital data base after obtaining consent from hospital management. The patients were contacted via tele conferencing methods such as video calling applications and telephonically by PG residents. The symptom of the patients was evaluated using Tinnitus handicap inventory [12,13] (THI) (Table 1.1) and further assessed for any complications. Based on the scores for each patient, plan of action for future was decided.

**3. Results**

Twenty-five patients who underwent intratympanic steroid therapy for the treatment of tinnitus before the commencement of nationwide lockdown were included in this study.

All these patients had two sittings of intratympanic injection over a period of 4 weeks (on a once in 2 weeks basis). Mean age of the patients was 53.86 and were followed up for 9 weeks post second sitting of the therapy. All the patients were followed up initially after the first sitting itself with Tinnitus Handicap Inventory (THI) and Pure tone audiometry. No complications were reported following the first sitting of intratympanic injection. During the virtual follow-up, Tinnitus Handicap Inventory (THI) of the patients at 1st follow-up (at the end of 2 weeks post 1st sitting) were compared with the THI of patients at the end of 9 weeks post 2nd sitting of procedure (Table 1.2). 20 out of the 25 subjects in this study showed improvement in the Tinnitus Handicap Inventory [12 subjects from Grade 4 to Grade 3, 6 subjects from Grade 4 to Grade 2, 1 subject from Grade 5 to grade 3 and 1 from Grade 5 to grade 4]. 5 out of the 25 initial subjects had no improvement in the THI

**Table 1.2**  
Tinnitus Handicap Inventory Severity Scale [14].

Grade	Score	Description
1	0–16	Slight: Only heard in quiet environment, very easily masked. No interference with sleep or daily activities
2	18–36	Mild: Easily masked by environmental sounds and easily forgotten with activities. May occasionally interfere with sleep but not daily activities
3	38–56	Moderate: May be noticed even in the presence of background or environmental noise, although daily activities may still be performed
4	58–76	Severe: Almost always heard, rarely, if ever, masked. Leads to disturbed sleep pattern and can interfere with ability to carry out normal daily activities. Quiet activities affected adversely.
5	78–100	Catastrophic: Always heard, disturbed sleep patterns, difficulty with any activity

Tinnitus Handicap Inventory Severity Scale.

**Table 2**  
Comparison of THI scores.

THI at 1st follow-up	THI at Virtual 2nd follow-up	No of patients	Interpretation	Percentage of study subjects
Grade 4	Grade 3	12	Improvement	48%
Grade 4	Grade 2	6	Improvement	24%
Grade 5	Grade 4	1	Improvement	4%
Grade 5	Grade 4	1	Improvement	4%
Grade 5	Grade 5	2	No improvement	8%
Grade 4	Grade 4	3	No improvement	12%

[3 had persistent grade 4, 2 had persistent grade 5] (Table 2). Patients showing no improvement were called on an urgent basis after the upliftment of lockdown for further evaluation with Pure tone audiometry and radiological modalities. Whereas, people who showed improvement were asked to continue on behavioral and cognitive therapy until the pandemic slows down.

Most of the patients who were contacted via video call or telephonically, were satisfied with this platform of observance (22 out of 25, 88%) and were willing to adopt this method for future follow-up.

**4. Discussion**

Tinnitus is a common presenting symptom encountered in ENT OPD and often is otological by etiology [15]. Persistent tinnitus burdens the patient with disturbed quality of life and frequently hinders the functionality of an individual [16]. Patients who visited our outpatient

department expressed similar impairing distress due to long standing tinnitus. Various treatment protocols are being put into use for treating tinnitus. Many studies have implicated intratympanic steroid injection as an efficacious and relatively safe method of management [10]. In our daily practice as well, intratympanic management modalities have given admirable and encouraging results in combating tinnitus. Numerous regimen are being followed for intratympanic therapy, most of them include multiple sittings and a close follow-up post intervention [17]. For our study, we have followed a similar 'once every 2 weeks' regimen to deliver steroid injections via intratympanic route.

During this pandemic, nationwide lockdown was enforced in India to tackle this notorious virus. This barred the patients from attending hospital for non-emergency visits. Being in the field of otorhinolaryngology, dealing with upper airway in a direct manner, it was suggested that direct contact with the patients should be limited only to emergency calls [4]. Thus, keeping in mind the safety of both the healer and the patient, a virtual form of follow-up was suggested.

In a study done at East Sussex Healthcare NHS Trust, UK [18] demonstrated Telephonic follow up as a safe, cost-effective, and efficient way of managing patients who underwent nasal surgery. Based on this study, similar set of protocol was derived for following up post intratympanic therapy patients. The Tinnitus handicap inventory is a widely used scoring system which has been implied for years for assessing tinnitus [12].

In our study, patients who have undergone 2 sittings of intratympanic steroid therapy before 23rd march 2020, were followed up virtually in order to assess the improvement using THI scoring. 20 out of 25 patients showed improvement in our study and were advised to follow behavioral & cognitive therapies. For these 20, next sitting of IT was also on later dates scheduled. 5 showing no improvement were asked to visit us immediately for further evaluation of the underlying cause.

## 5. Conclusion

Intra-tympanic steroid injection is a commonly practiced procedure used for treating longstanding tinnitus. It's a safe and effective management modality which demands multiple sittings and frequent follow-up. In the given premise of COVID 19 Pandemic, the rule of thumb is to minimize the physical proximity between the patients and the doctors to avoid unnecessary exposure. Keeping in mind the safety profile of healthcare workers, hospital visits should be limited to emergency basis only. In such an unrivalled situation, technology can help us to overcome the geographical barrier created by the current lockdown policies. Following up patients virtually using video calling applications and telephonic calls can prove to be a handy tool ensuring patient care and safety of healthcare professionals. This method of observation has exhibited wide acceptance and patient satisfaction.

## Funding

No funding was received from any source.

## Ethics approval

Ethical approval was obtained from Institute ethical committee.

## Consent to participate

Due to ongoing corona virus pandemic, verbal consent from each participant was obtained over telephone.

## Consent for publication

Verbal consent for publication from each participant was obtained over telephone.

## Declaration of competing interest

No potential conflict of interest was reported by the authors.

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