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Review Article

ROLE OF AYURVEDA IN MANAGING TINNITUS

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ABSTRACT

Tinnitus is one of the annoying disorders which can significantly impair patient's quality of life and productivity. Although it is not a life threatening disease, but it results into emotional distress, cognitive distress, intrusiveness, auditory and perceptual difficulties, sleep disturbances, and various somatic complaints. Its incidence and prevalence are enhancing day by day. Various pharmacological agents including anticonvulsants, anxiolytics, antidepressants, muscle relaxants etc. are presently used or trialed for its pacification, but there is little evidence of their benefit over harm. The role of invasive and non-invasive Neurostimulation treatments, supposed to be very effective, are also little known. The introduction of Hearing aids and cochlear implantation are also not very much conclusive. No evidence of a significant change in the subjective loudness of tinnitus has been noticed with Cognitive behavioural treatment. In this way, there is a need for making an availability of uniformly accepted, broadly effective treatments capable of drastically decreasing the loudness and impact of tinnitus and withstanding systematic replication. This article is for serving the very purpose. Here, an effort has been made to present the remedial procedures and regimen for the alleviation of tinnitus described in Ayurveda, an ancient healing science of India. In Ayurveda, tinnitus has been delineated in the name of *Karnanada*. The article also brings about several case studies and clinical studies on tinnitus carried out at different centres/Institutes of Ayurveda.

KEYWORDS: Tinnitus, *Karna Nada*, Ayurveda, *Nasya, Karnapoorana, Shiro Dhara.*

INTRODUCTION

Tinnitus is a perception of any sound originating in an involuntary manner, either unilaterally or bilaterally, in the absence of any external acoustic or electric stimulus.[1,2] Such as perceived sound may range from a quiet background noise to a noise audible over loud external sounds. It interferes with the quality of life and results into emotional distress, cognitive distress, intrusiveness, auditory and perceptual difficulties, sleep disturbances, and various somatic complaints.

The graveness of this disorder is evident from the development of Tinnitus Handicap Inventory, Tinnitus Questionnaire, Tinnitus Reaction Questionnaire, Tinnitus Severity Index, Tinnitus Handicap Questionnaire and Tinnitus Severity Questionnaire. More recently, the Tinnitus Functional Index (TFI) was developed as a new measure of the severity and negative impact of tinnitus, both for use as a diagnostic tool and for measuring treatment-related changes in tinnitus. [3]

Out of the two categories- subjective and objective, it is the previous one which is of prime concern, since objective tinnitus (pseudo-tinnitus) is present in less than 1% of patients as a main complaint, which is either due to vascular phenomena or muscle changes such as spasm of the muscle of the middle ear or palate.[4]

National Centre for Health Statistics reported presence of tinnitus in 32% of the USA population with 6% having severe degree of tinnitus.[5] Large demographic studies estimate global chronic tinnitus prevalence between 8 and 25% in adults.[6,7] A population-based study of hearing loss in adults aged 48 to 92 years found that tinnitus had a prevalence of 8.2% at baseline and an incidence of 5.7% during a 5-year follow-up.[6] The prevalence of tinnitus increases with age.[8]

The exact cause of tinnitus is still not fully understood, however, on the basis of the mixed results produced by various therapeutic approaches to tinnitus, it is generally assumed that tinnitus has diverse physiological causes. Age-related hearing loss (presbyacusis) and noise exposure remain the most common causes. Many clinical studies have reported that otological disorders causes changes in the cochlear structures or neuroplastic alterations in the

central auditory pathways, leading to tinnitus.[2,9] According to Henry et al., the problems caused by tinnitus indicate that the limbic system and the autonomic nervous system are activated by the tinnitus signal, and it brings about the irritation felt by the tinnitus patients.[10]

Ototoxic medications like high-dose acetylsalicylic acid, nonsteroidal anti-inflammatory drugs, aminoglycoside antibiotics (e.g. gentamicin), loop diuretics (e.g. furosemide), and chemo-therapeutics (e.g. cisplatin, valproic acid, quinine), may also lead to bilateral tinnitus[11]. Higher 1-year prevalence is associated with increased age (peaking between ages 60 and 69), body mass index of 30kg/m2 or greater, smoking (former and current), diabetes mellitus, and hypertension.[12]

At present, there is a lack of uniformly accepted, broadly effective treatments capable of drastically decreasing the loudness and impact of tinnitus and withstanding systematic replication. Many classes of drugs used or trialed for chronic tinnitus include various anti-arrhythmics, anti-convulsants, anxiolytics, glutamate receptor antagonists, antidepressants, muscle relaxants and others, but there is little evidence of benefit over harm.[13,14]

There is minimal high-level evidence for the efficacy of hearing aids for tinnitus in systematic reviews, although it has been suggested that hearing aids reduce tinnitus awareness, and thereby stress, and reduce central auditory gain.[15] Small case–control studies have shown the efficacy of cochlear implantation in patients with unilateral deafness and persistent, bothersome tinnitus. Hence, larger studies are necessary to confirm these findings.

Hypothesised to alter tinnitus-generating neural firing, neurostimulation treatments (invasive or non-invasive) use electromagnetic, electrical, or sound stimuli, but the precise neural mechanism by which changes occur at both local and network levels is not fully understood.[16,17] Here, Non-invasive treatments include transcranial electrical stimulation, vagus nerve stimulation (trans-cutaneous), repetitive transcranial magnetic stimulation (rTMS), and acoustic coordinated reset (CR) neuromodulation. Invasive treatments include vagus nerve stimulation (implantable device), cortical surface stimulation, and deep brain stimulation.

Cognitive Behavioural Treatment (CBT) have been applied in tinnitus research for decades and the results of the effectiveness of CBT approaches for tinnitus have been shown to vary in decreasing tinnitus severity/distress, tinnitus-related fear, tinnitus disability, and tinnitus-related cognitive problems and in improving daily life functioning.[18-20] In a Cochrane study in 2010, significant improvements in depression scores and quality of life were found. They also found that CBT had a positive effect on the management of tinnitus. However, they did not find evidence of a significant change in the subjective loudness of tinnitus.[21]

Tinnitus Retraining Therapy (TRT) is a popular form of therapy that combines directive counseling and acoustic therapy to promote habituation and reduce the annoyance and awareness of tinnitus. The benefit and the longevity of TRT therapeutic effect have been reported in case studies, retrospective reviews and uncontrolled or non-randomized clinical trials.[22-25] Unfortunately, controlled trials have been criticized for study limitations such as inadequate controls and inclusion of trial participants that do not reflect typical population demographics.[26]

Sound therapy (including masking, music, and environmental sound) may be useful for acute relief purposes but is not considered as effective intervention with long-term results. There is evidence for safety but little high-level evidence for the effectiveness of sound therapy or acupuncture.

Ayurvedic Aspects

In Ayurveda, the disease with symptoms similar to those of Tinnitus has been delineated in the name of *Karna Nada* and has been described in *Shalakya Tantra*. *Shalakya Tantra* is one of the eight branches of Ayurveda which deals with aetiology, prodromal symptoms, symptoms, diagnosis, prognosis, prevention and treatment of diseases that are located above the neck region, incorporating Eye, E.N.T., Head &Neck and orodental disorders.[27]

Owing to the various etiological factors, when *Vata Dosha* (a biological force governing all motion within the body) gets vitiated due to its entry into non-assigned channels or due to obstruction by other *Dosha* in *Sabdavaha Srotas* (auditory canal), it produces different types of sounds in the ear and it is known as *Karna Nada*.[28]

Keeping the gravity of the disease into the consideration, its management should incorporate three tier holistic approaches comprising of Symptomatic improvement, Progression arrest and Rejuvenation of damaged or degenerated nerve cells. The dedicated study of Ayurvedic text/classics suggests that the required holistic approach may be carried out in following way:

1. **Adoption of preventive measures**
   - Intake of proper food and sleep and following of a healthy lifestyle.
   - Treatment of underlying causes.

2. ***Snehana karma-*** It may include:

- ***Snehapaana* (internal administration of lipid):** It may be performed with *Indukant Ghrita, Ashwagandhadya Ghrita, Dashmool Ghrita, Bilvadi Ghrita,* etc.
- ***Karnapoorana* (filling in of external acoustic meatus):** It may be performed with substances like *Bilva Taila, Dipika Taila, Dhanvantar Taila* etc.

The entire procedure of *Karnapoorana* broadly can be divided into 3 steps:

- ***Purva Karma-*** Here, the patient is instructed to lie down on the right or left lateral position depending on the affected side. Gentle massage with lukewarm oil in the vicinity of the ear for a short period should is carried out and it is followed by mild hot fomentation.
- ***Pradhana Karma-***The gently warmed medicated lipid is poured in drops in the external auditory canal straightened by pulling the pinna backward and upwards till the ear canal is filled up and kept as such for a specific period.
- ***Pashchata Karma-*** The ear is cleaned with dry cotton mopping.

In the case of bilateral disorder, the same procedure is repeated in the fellow ear.

3. ***Virechana* (Therapeutic purgation)**
4. ***Nasya*** (Infusion of Ayurvedic medicine into the nostrils)
5. ***Shiro Dhara*** (Rhythmic pouring of medicated oils onto the head for a specific period)
6. ***Vasti*** (Therapeutic enema)
7. **Nutritive oral Ayurvedic medication:** *Balarishta, Saraswatarista, Sariwadi vati, Ashwagandha, Yashtimadhu, Giloya Satva., Godanti Bhasma, Vatavidhwansaka Rasa/ Mahavatavidhwansaka Rasa, Brihat Vata Chintamani Rasa, Ekangveer Rasa, Swarna makshika Bhasma* etc.

The role of the above mentioned treatment modalities have also been substantiated by significant case/clinical studies carried out at different Institutes/centres of Ayurveda. Some of these are presented below:

1. ***Kapikacchu Ghanavati*[29]**

Trial drug *Kapikachhu Ghana Vati*, was given to the patient with *Godugdha* (cow milk), two times a day (morning and evening). *Kapikachhu Ghana Vati* was authenticated and standardized prior to trials. Clinical trials were conducted and selected patients were randomly allotted to Trial and Control groups (100 patients each). Regular follow-ups at 15th, 30th, 45th and 60th day were conducted for a maximum of 60 days. The examinations were done on day 0 and day 60. Overall improvement after treatment of *Kapikachhu Ghana Vati* in *Karnanada* in right and left ear was 65.45% and 87.50% respectively.

2. ***Mahamash Taila Karanpoorna* and *Ashwagandhadya Ghrita Paana*[30]**

Trial drug *Mahamaash taila* (2ml) and *Ashwagandhadya ghrita* (10gm) with *Sukhoshna Dugdha* (warm milk) were given to a single group of 10 patients twice a day for *Karnapooran* and *Paana* respectively for a period of 1 month. Regular follow-ups at 10th, 20th, and 30th day were conducted for a maximum of 30 days. The examinations were done on day 0 and day 30. Statistically significant improvement ($p<0.001$) after treatment was observed in the form of diminution in mean score of Tinnitus Severity Index Questionnaire (TSIQ) from 17.1 to 9.6 and 43.89% symptomatic relief.

3. ***Bilva Taila Karna Poorana* With and Without *Ashwagandhadya Ghrita* [31]**

Clinical trials were conducted and selected patients were randomly allotted to Group A and Group B (15 patients each). Group-A was given *Bilva Taila Karna Poorana* and *Ashwagandhadya Ghrita* internally, whereas Group-B was given *Bilva Taila Karna Poorana* and plain *Goghrita* internally. The trial was completed in 60 days and a follow up was carried out after 1 month. The results were significant in both the groups with an improvement of 65.63% and 48.39% in Group A and Group B respectively.

4. ***Erandadi Taila Nasya* and *Sarshapa Taila Karnapurana* [32]**

Nasya with 6 drops of *Erandadi Taila* in each nostril and *Karnapurana* with 10-12 drops of *Sarshapa Taila* in each canal was given to a single group of 15 patients of tinnitus. 3 courses of *Nasya* and *Karnapurana* for 7 days each with an interval of 5 days in between were given and a follow-up was carried out after 1 month. A statistically significant ($p<0.0001$) improvement was observed with 54.38% relief in the symptom of sound in the head and ears.

5. ***Karnapoorana* with *Mahamasha taila* and *Shamana Aushadha*[33]**

A 51 years old patient with tinnitus of 5 months and having an occupational history of working in textile factory was introduced *Karnapoorana* with *Mahamasha taila* (in the evening) for 7 days followed by *Shamana Aushadha* comprising of a mixture of *Mahavatavidhwansaka rasa, Tankana Bhasma, Giloya Satva* and *Godanti Bhasma* (with honey in the early morning and in the evening). He

was also given *Ashwagandha Churna* (with lukewarm milk twice a day) and *Balarishta* (with equal water twice a day). After 21 days of the treatment, around 80% improvement in the condition of tinnitus was observed.

6. **Specific Ayurvedic cleansing procedures and Ayurvedic medicines**[34]

A 64-year-old male with tinnitus of 7 months (just after his visit to United States) was given *Mahakalyanaka ghritam, Brahma rasayana* and *Mahavata vidhwamsa rasa* for 7 days followed by *Virechana.* Afterwards *Nasya* with *Ksheerabala Taila* (in the morning) and *Karnapurana* with *Sarshapa taila* (in the evening) for 7 consecutive days were carried out for 7 days. Finally *Sirodhara* was done with *Balaswagandhadi taila* for 15 days. With this treatment, the tinnitus of the patient got markedly diminished as reflected by diminution of Klockoff and Lindblom tinnitus grading from Grade 3 to Grade 1 and Tinnitus Handicap Inventory (THI) Score 46 to 14.

7. ***Rasayana* therapy** [35]

This case study deals with a 45 years old male patient having noise induced tinnitus and high frequency sensorineural hearing loss since 1.5 year. After 3 month of Ayurvedic treatment with *Rasayana* therapy his tinnitus and other associated complaints were decreased.

8. **Specific Ayurvedic Preparation** [36]

A 17 years old male patient, diagnosed with Cochlear Synaptic Tinnitus, was given *Ekang veer rasa,* Geriforte and *Saraswatarishta* for 2 months. After the treatment, a significant improvement was observed in tinnitus and associated symptoms, except hearing loss.

9. **Several Ayurvedic procedures and medicines**[37]

A 20 year old diagnosed case of otosclerosis with tinnitus as a main associated symptom was switched on to Ayurvedic procedures comprising of *Ksheera dhuma Nasya* with *Ksheerabala Taila, Karnapoorana* with *Dhanvantara Taila Shirodhara* with *Ksheerabala Taila* and *Matravasti* for 7 days. Afterwards, he was given a herbomineral preparation comprising of *Ekangveer ras*, *Mahavaat Vidhwans Ras*, *Swarnamakshika*, *Ashwagandha churna* and *Brihat Vata chintamani ras*. Additionally, he was also given *Saraswatarista, Sariwadi vati* and *Bilva Taila*.

After 2 months of the treatment, the symptoms of the patient (hearing loss and tinnitus) were very much minimized.

DISCUSSION

Non-surgical, non-invasive and cost-effective management of tinnitus is possible with the adoption of Ayurvedic procedures coupled with that of proper diet habit, regimen and code of conduct. *Snehana* karma is considered as the best procedure in alleviation of *Vataja* disorders including *Karna Nada* because of its tremendous effects on *Vata Dosha*. Properties of *Vata Dosha* are exactly opposite to that of *Snehana*. In this way, *Ghrita Paana* and *Karnapoorana* are capable of pacifying tinnitus.

Nasal cavity structures have direct communication with the sensorineural structures of brain and this is a natural gateway to brain. Via this anatomical communication, the medicine of *Nasya* reaches to "*Sringataka Marma"* (cavernous sinus) which is the seat of control of perception of vision, hearing, smell, and taste. In this way, role of *Nasya* in preservation and promotion cannot be overemphasized. The elaboration of role of *Virechana, Shiro Dhara* and *Vasti* in the management of *Vataja* diseases is not needed, since their validity had already been proved for that very purpose.

Ashwagandha and *Balarishta* bring about the replenishment of lost body tissue (*Dhatusamya*), since *Dhatu Kshaya* is also a cause of vitiation of Vata *Dosha. Vatavidhwansaka rasa/ Mahavata vidhwansaka rasa, Brihat Vata Chintamani Rasa, Ekangveer Rasa* are known Ayurvedic medicines capable of not only pacifying the vitiated Vata Dosha, but also are enriched with immunomodulatory and anti-stress properties. *Yashtimadhu, Giloya Satva., Godanti Bhasma, Sarswatarista, Sariwadi Vati* etc. further enhance the well being of the sufferers of tinnitus with their inherent healing/health promoting capacities.

CONCLUSION

The potential of Ayurvedic procedures and medicines is yet to be exploited. Ayurveda is capable of playing a major role in combating tinnitus and subsequently in checking compromised quality of life without imposing any adverse reaction/event/effect to the user. The management of recalcitrant disorders like tinnitus, for which there is a lack of promising treatment in the mainstream healing system, must be tried with Ayurveda (Alternative therapy). Masses must be educated and encouraged to adopt Ayurveda for not only getting rid of their tinnitus but also for the acquisition of healthy hearing/listening as well.

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