

## Review Article on Karnanada

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**ABSTRACT:** Salakya Tantra is one among the eight branches of Astanga Ayurveda. Salakya Tantra deals with diseases that affect part above the neck like eyes, nose, throat, ear, and head. Karnanada is one among twenty eight Karnarogas explained in Susruta Samhita, Bhavaprakasa and YogaRatnakara. Karnanada can be correlated to the tinnitus in modern literature. When the Vata gets localised in the channels of the ear the patient hears various types of sounds like those of a Bheri (bulge/drum), Mrdanga, Samkha etc, are known as Karnanada. The prevalence of tinnitus in the adult population is estimated to range from 6% to 19%. Several theories have been proposed to explain the mechanisms underlying tinnitus. Treatments for tinnitus include Snigdha Virecana, Nadi Sweda, Pinda Sweda, Dhupana, Basti Karma Navana, Abhyanga, Karnapurana and in modern literature medical and surgical, pharmacotherapy, acoustic therapy, counselling and education, Cognitive Behavioural Therapy (CBT), Tinnitus Retraining Therapy, and Electrical Stimulation. This paper reviews the characteristics, causes, mechanisms, and treatments of tinnitus in Ayurveda and modern medicine.

### INTRODUCTION

Elemental reason behind the setting up of any disease according to Ayurveda is Atiyoga Heenayoga and Mithyayoga of Karma, Kala and Artha (Indriya). Like as Atiyoga Heenayoga and Mithyayoga of Shabda might be the causal factor behind the genesis of Karnanada. In Karnanada patient can hear different type of sound in ear which can be unilateral or bilateral and stable or transient type. This sound may vary in pitch, quality, and loudness. It might be swishing, hissing, roaring, clicking, rustling type of noise. It is more irritating in a silent environment as in night when the masking effect of ambient noise from environment is lost. It is a symptom not a disease and causes might be present in external, middle, or inner ear in 8th nerve or inside the brain. Some systemic disorder like anemia hypo or hypertension, certain drugs which effect on inner ear or auditory pathway may also precipitate tinnitus. It can also result from prolonged exposure to excessive loud sound, which could be the possible reason of increasing cases of tinnitus in youngsters,

as large number of young people uses mobile phones, headphone, ear phone etc. for longer duration which radiates electromagnetic wave and high level of electromagnetic field, which can be harmful to ear along with other body parts. It is generally classified as either objective or subjective. Objective tinnitus in which sound produced by Para auditory structures which may be heard by patient and examiner both, often pulsatile in nature. In subjective tinnitus sound is only perceived by the patient. The great majority of the tinnitus sufferers have subjective tinnitus and generally when the word „tinnitus“ is used, it implies subjective tinnitus, which only is audible by the tinnitus patient. Instead of classifying tinnitus in „subjective“ or „objectivetinnitus“, „genuine tinnitus“, could be used and replace the term „subjective tinnitus“. Objective tinnitus (sometimes referred to as somatic tinnitus) in which is a sound sensations created by an acoustical source within the body, should rather be described by the condition causing this sensation and not be described as tinnitus. For tinnitus it’s really tough to pin point the exact cause of disease, but it’s generally agreed that it may come from any physical or mental change but not essentially related to the ear. Where possible cause discovered, and treated tinnitus get resolve but some time even the treatment of underlying disease cannot alleviate tinnitus. Therefore, tinnitus can consequently be defined as “a sound sensation in the absence of an internal or external acoustical source or electrical stimulation”, hence in this article we will discuss subjective tinnitus.

### PURVARUPA

Purvarupa indicates the upcoming disease. Stage of Sthanasamsrayais term as Purvarupa. In stage of Sthanasamsraya vitiated gets aggravated and move to different parts and get accumulated is one of the region of the body. In classical literature there is no specific Purvarupa (prodromal symptoms) are mentioned in disease of Karnanada. Acarya Madhavakara explain Purvarupaas precursor of Rupa Laksanas with less intensity, which could be taken as less intensity of sound in ear, or shorter

duration or intermittent frequency be considered as Purvarupa of Karnanada. Acarya Caraka explain are; Avyakta Laksanam Tesam Purvarupama Iti Smrtama. Ca. Ci. 28/19 Avyakta Laksanas (means unknown symptom) are the Purvarupa of Vata Vyadhi. [1-4]

#### RUPA

Nanavidha Sabda-Different kinds of sounds heard in Savdavaha Srotas. Vividhan Sabda is heard in Savdavaha Srotas are as follow: Bheri, Mrudanga, Samkha, Bhrungara, Kaunca, Mandura, Tantri, Vividha Sabda etc.

#### SAMPRAPTI

Samprapti is the process of manifestation of the disease by the morbid Dosa which are circulating all over the body. When the Vata gets localised in the channels of the ear the patient hears various types of sound like those of a Bheri (bulge/drum), Mrudanga, Samkha etc.

#### CIKITSA OF KARNANADA

The Karnanada is a Vataja Pradhana Dosa Vyadhi. Soor aims are to reduce Vata in the treatment of Karnanada. Acarya Susruta mentioned the common treatment for Karnasula, Karnanada, Badhirya and Karnaksweda roga.

#### TINNITUS

Tinnitus is defined as a phantom auditory perception-it is a perception of sound without corresponding acoustic or mechanical correlates in the cochlea. Tinnitus represents one of the most common and distressing otologic problems, and it causes various somatic and psychological disorders that interfere with the quality of life. Clinical Manifestation Characteristics of Tinnitus The sound perceived by those with tinnitus can range from a quiet background noise to noise that is audible over loud external sounds. Tinnitus is generally divided into two categories: objective and subjective. Objective tinnitus is defined as tinnitus that is audible to another person as a sound emanating from the ear canal, whereas subjective tinnitus is audible only to the patient and is usually considered to be devoid of an acoustic etiology and associated movements in the cochlear partition of cochlear fluids. The sounds associated with most cases of tinnitus have been described as being analogous to cicadas, cricket, winds, falling tap water, grinding steel, escaping steam, fluorescent

lights, running engines, and so on. It is believed that these types of perception results from abnormal neuronal activity at a subcortical level of the auditory pathway. The pattern characterizing tinnitus is related to the library of patterns stored in auditory memory and also, via the limbic system, associated with emotional states.

#### Incidence and Prevalence

The prevalence of tinnitus in the adult population is estimated to range from 6% to 19% of adults, depending on the population samples and the definition of tinnitus used in the survey.

Risk factors for tinnitus have been identified from large epidemiological surveys and include non-modifiable factors of gender (male) and ethnicity (non-Hispanic Whites), and modifiable factors including body mass index ( $\geq 30 \text{ kg/m}^2$ ), hypertension, diabetes mellitus, dyslipidemia, anxiety disorder, noise exposure, and smoking. [5]

#### Causes of tinnitus

Main causes of subjective tinnitus Otologic problem and hearing loss: Loud noise, presbycusis, Meniere's disease, acoustic neuroma, external ear infection.

#### Pharmacological Causes

Analgesics, antibiotics, chemotherapy and antiviral drugs, loop diuretics, anti-depressants, psychedelic drugs (5-MeO-DET, 5-Methoxy-diisopropyltryptamine, diisopropyltryptamine, harmaline, N,N-dimethyltryptamine, psilocybin, salvinorin A).

#### Neurologic disorders

Traumatic brain injury meningitis, encephalitis, strokes, multiple sclerosis, chiari malformation, auditory nerve injury. Metabolic Disorders: Thyroid disorders, hyperlipidemia, vitamin B12 deficiency, iron deficiency, anemia. Psychiatric Disorders: Anxious and depressive states. Other: Tension myositis syndrome, fibromyalgia, head and neck muscle spasm, Temporomandibular joint disorders, thoracic outlet syndrome, lyme disease, hypnagogia, sleep paralysis, glomus tympanicum, herpes infections.

Main causes of objective tinnitus:

Pulsatile tinnitus: Altered blood flow or increased blood turbulence near the ear: Atherosclerosis, venous hum, carotid artery aneurysm, carotid artery dissection. Muscle contraction that cause clicks or crackling around the middle ear. Main Hypothesized Patho mechanisms of Tinnitus Spontaneous Otoacoustic Emissions: Small acoustic signals perceived as tinnitus.

Edge Theory: Increased spontaneous activity in the edge area.

Discordant Theory:

Discordant dysfunction of damaged outer hair cells and intact inner hair cells. Main Central Auditory System and Somato Sensory Theories of Subjective Tinnitus The dorsal cochlear nucleus: Hyperactivity/plastic readjustment of DCN Auditory plasticity theory: Enhanced neural activity due to cochlear damage Crosstalk theory: Ephaptic coupling b/w nerve fibers. Pathophysiology The changes in the auditory nervous system, especially at the dorsal (DCN) and ventral cochlear nucleus (VCN) underpinning tinnitus are often represented by a reduction in the inhibitory rather than an excitatory input, resulting in a shift in the balance between inhibition and excitation. Deprivation of input may cause neural plasticity to change the relationship between inhibition and excitation and protein synthesis and finally impact on neurotransmission especially at the DCN, the inferior colliculus (IC), together with the primary and secondary auditory cortices eventually affecting the thalamic and dorsal cortex transmission, the amygdala, and other structures. The rerouting of information may cause structures of the central nervous system (CNS) that are not normally involved in processing auditory information to become activated by sound stimulation (i.e., the abnormal involvement of the non-classical-non-specific/extra lemniscal-pathways). Yet to date, no univocal or exhaustive appreciation of tinnitus determining neural abnormalities have been reached; with its pathophysiological correlates still remaining a debated issue. Among others, the following evidence and hypotheses have been postulated. Peripheral Auditory System Spontaneous Otoacoustic Emission: Small acoustic signals presumed to be generated by the electromotile activity of the outer hair cells (OHCs) of the cochlea and propagated into the external auditory canal may be

abnormally perceived as tinnitus. Edge Theory: Increased spontaneous activity in the edge area, which represents a transition from normal OHCs on the apical side of a lesion to OHCs toward the basal side that are missing or altered, may contribute to tinnitus perception. Discordant Theory: The discordant dysfunction of damaged OHCs and intact inner hair cells (IHCs) may result in the disinhibition and increased spontaneous activity of neurons in the DCNs that receive excitation from IHCs, but with no inputs from the damaged OHCs, therefore playing a role in tinnitus phenomenon. Central Auditory System The Dorsal Cochlear Nucleus: Hyperactivity by disinhibition or plastic readjustments of the DCN, triggered for instance by OHC damage or a reduction in auditory nerve input have been supposed to concur in tinnitus genesis. Auditory Plasticity Theory: Damage to the cochlea enhances neural activity in the central auditory pathway, such as the IC and the temporal lobe of the auditory association cortex (similar to the phantom limb sensation in amputees).

#### TREATMENT

According to modern medical science there is no particular cure for tinnitus (as it is a symptom rather than the disease) for achievement of good result the patient should be investigated thoroughly to rule out any organic cause for tinnitus and if present, treatment should be directed towards the basic cause. If can't be able to find the cause, then treatment should starts with avoidance of dietary stimulants such as coffee, tea, cola, etc. with cessation of smoking. Vitamin B12 supplements, tranquilizer should be given (when patient having problem with sleep). Other forms of treatment include masking, hearing aids, bio feedback, and noise generators etc. If we failed to achieve good result than reassure the patient (because many times patient must learn to live with it) and psychotherapy should be given. As cases of tinnitus are increasing day by day, especially in youngsters, we must find proper treatment for this condition. According to our classics, generally Vata Dosha lies behind the maximum aural disease and Karnanada is one among them. Hence Vata Shamaka treatment such as Ghruta Paana, Rasayana Sewan should be useful for it. Four disease namely Karnashula, Karnanada, Karna- badhirya and Karnasweda generally treated with same line of treatment. As tinnitus is a Vata disorder than Vata balancing herbs and therapies (Snehan, Sewdana, Nasya, Karnapoorana, Shiro and Pada Abhyang alon

with Medhya, Sedative or Balya Chikitsa) will be beneficial. Snehan around the ear along with face with Bala Tail, Narayan Tail, Dashmoola Tail followed by Swedana (hot fomentation) should be given. After that Karna- poorana with Kshar Tail, Sharshap Tail Gruha- dhumadil Tail is given. If Kapha is predominant then Karnapoorana can be done after Vamana. Before Karnapoorana Nasya with Anu Tail, Bala Tail can also be given. Abhyanga, Shiro abhyanga (head massage) and Padabhyanga (Foot massage with lukewarm Bala Tail, Kshirbala Tail, Sesame Tail, has a specific effect in calming the Prana Vayu. At bedtime, warm oil should be applied to the soles of the feet and also to the scalp. This treatment rapidly normalizes the Prana Vayu. Karnapoorana (ear drops) to calm the Vata in the ears, few drops of warm oil is applied daily to each ear. The oil is allowed to remain in the first ear for ten minutes, then that ear is cleaned, and the same procedure is followed with the other ear, with the patient lying on the other side. Typically, this treatment should alleviate tinnitus, and most other symptoms of prana Vayu disturbance, within eight to ten days. Bilwadi Tail, Apamargkshar Tail, Dashmool Tail, Narayan Tail, Vishnu Tail, Dipika Tail, Hingwadi Tail, Nirgundi Tail can be used for Karnapoorana. Kawala & Gandusha may also have effect in strengthens the nerves of eyes and ears and also pacifies aggravated Vata. Acharya Chakradutta said that medicines used for VatajaShula is also helping in cure of Karnanada and Karna badhirya. Along with above treatment Pratishtyaya Shamak treatment with Medhya Aushadha (Saarivadi Vati, Brahmi Vati, Ashwagandha Churna, Shatavari Churna etc). Should be given for strengthening the nerve and achieving for better results.

#### COMPLICATION

Tinnitus (Karnanada) may leads to hearing loss (Karnabaadhira) but it may not be necessary that all tinnitus cause hearing loss. People with high Vata imbalance or Vata body type are more prone to certain other disorders like hearing loss. So, these people prone to a condition called hyperacusis (certain high-frequency sounds can be very painful). It may lead to concentration problems, sleeping problems, irritation and annoyance. Hypersensitivity to sound or increased sensitivity in silence also observes. Chronicity of this problem causes despair, frustration and depression in many people.

#### DISCUSSION

Karna is one of the most important Gyanendriya in body. Its important function is hearing. It is also important organ in maintaining balance of body. According to Acarya Susruta, there are 28 Karna Roga and Karnanada is one among them. In Karnanada i.e. tinnitus is a Vata Dosa Pradhana Vyadhi. When the Vata gets localised in the channels of the ear the patient hears various types of sound like those of a Bheri (bulge/drum), Mrudanga, Shankha etc. In Ayurvedic literature various treatment modalities are applicable in treating Karnanada including administration of Vatahara Cikitsa, administration of Snigdha Ausadha, Snigdha Virecana, Nadisweda, Pinda Sweda, Dhupana with Ksouma, Guggulu and Agarau, Basti Karma, Navana, Abhyanga, Karnapurana etc. In modern science different treatment methods like medical treatment, surgical treatment, palliative treatment, use of tinnitus maskers and hearing aid if there is accompanying hearing loss, electrical stimulation, psychotherapy, relaxation therapy etc. are used for tinnitus but with very little success. Thus the Ayurveda procedures and medicines are to have very effective treatment without side effects and economical drug on it. In modern science various pharmacological drugs are used, but their effect is found to be less.

#### CONCLUSION

Concluding the study, any complaints related to the ear is to be treated early. Degeneration conditions of auditory nerve and other structures of the ear, disturbs the day today activity of a person. In Ayurveda, Tinnitus, hearing loss and different ear infections managed with following treatment procedures, Snigdha Ausadha, Snigdha Virecana, Nadi Sweda, Pinda Sweda, Dhupana with Ksouma, Guggulu and Agarau, Basti Karma, Navana, Abhyanga, Karnapurana etc., treat disease at the root cause level and also help to correct Dosa using diet and lifestyle habits. Ayurveda drugs reduce risk of adverse drug reactions. Thus we can conclude that the Karnanada (tinnitus) is a condition for which modern science treatment is with very little success, and Ayurvedic approach of treatment in Karnanada is treated to the systemically and alleviates the root cause of the Dosa.

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