

## A Conceptual Study of Karnapooran In Prevention of Nihl (Noise Induced Hearing Loss)

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**ABSTRACT:** *Noise-induced hearing loss limit ability to hear high frequency sounds, understand speech and seriously impairs ability to communicate. The effects of hearing loss can be profound, as hearing loss can interfere with ability to enjoy socializing with friends, playing with your children or grandchildren, or participating in other social activities you enjoy, and can lead to psychological and social isolation. High frequency sound damage to the microscopic hair cells found inside the cochlea. Damage of cell is creating hearing loss. Karnapooran reduce the frequency of sound also smoothing the pathway and which ultimately reduce the risk factor of hearing loss. Karnapooran is a one of the best procedure for the Noise-induced hearing loss (NIHL).*

**Key words:** *Karnapooran, Badirya, Uchhesruti, NIHL (Noise Induced Hearing Loss)*

### INTRODUCTION:

Disease of the senses organs directly hampers the specialized sensory functions and this make a person handicapped. Shraavanendriya (sensory faculty of hearing) is one among the Gyanendriya which works through ears. It is the foremost developed or organized specialized sense which takes its origin from Aakash Mahabhuta which is responsible for sound energy perception and orientation maintenance.<sup>i</sup>

Every year, approximately millions of people in the World wide are exposed to hazardous noise. Loud noise can also create physical and psychological stress, reduce productivity, interfere with communication and concentration, and contribute to workplace accidents and injuries by making it difficult to hear warning signals. Noise-related hearing loss has been 16% of permanent hearing loss due to high workplace noise levels and 7 to 21% in various sub regions.<sup>ii</sup>

Exposure to high levels of noise can cause permanent hearing loss. Neither surgery nor a hearing aid can help correct this type of hearing

loss. Short term exposure to loud noise can also cause a temporary change in hearing (your ears

may feel stuffed up) or a ringing in your ears (tinnitus). These short-term problems may go away within a few minutes or hours after leaving the noisy area. However, repeated exposures to loud noise can lead to permanent tinnitus and/or hearing loss.

### AIMS AND OBJECTIVES:

- Evaluate the effect of *Karnapooran* in the NIHL.
- Evaluate the prevention aspect of NIHL.

### ANATOMY AND PHYSIOLOGY OF HEARING:

Hearing is a series of events in which sound waves in the air produce electrical signals and cause nerve impulses to be sent to the brain where they are interpreted as sound. The ear has three main parts: the outer, middle and inner ear. Sound waves enter through the outer ear and reach the middle ear where they cause the ear drum to vibrate. The vibrations are transmitted through

three tiny bones in the middle ear, called the ossicles. These three bones are named the malleus, incus and stapes (and are also known as the hammer, anvil and stirrup). The ear drum and ossicles amplify the vibrations and carry them to the inner ear. The stirrup transmits the amplified vibrations through the oval window and into the fluid that fills the inner ear. The vibrations move through fluid in the snail-shaped hearing part of the inner ear (cochlea) that contains the hair cells. The fluid in the cochlea moves the top portion of the hair cells, called the hair bundle, which initiates the changes that lead to the production of the nerve impulses. These nerve impulses are carried to the brain where they are interpreted as sound. Different sounds move to the population of hair cells in different ways, thus allowing the brain to distinguish among various sounds, for example, different vowel and consonant sounds.

#### CAUSES OF HEARING LOSS:

- Otosclerosis.
- Meniere's disease
- Drug induced – amino glycoside antibiotics (such as streptomycin, neomycin, kanamycin); salicylates in large quantities (aspirin), loop diuretics (lasix, ethacrynic acid); and drugs used in chemotherapy regimens (cisplatin, carboplatin, nitrogen mustard).
- Tumors – one of the common tumors in the ear is called a vestibular schwannoma. These tumors develop around the 8th cranial nerve, which is also known as the auditory nerve.
- Trauma – trauma to the ear can include fractures of the temporal bone, puncture of the eardrum by foreign objects, sudden changes in air pressure, and very loud noises.
- Presbycusis – this hearing loss is caused by natural aging of the human body and begins after age 20,
- Noise-induced hearing loss (NIHL) – this is hearing loss due to exposure to either a sudden, loud noise or exposure to loud noises for a period of time. A dangerous sound is anything that is 85 dB (sound pressure level – SPL) or higher.

#### NOISE-INDUCED HEARING LOSS (NIHL)

Of the roughly 40 million Americans suffering from hearing loss, 10 million can be attributed to

noise-induced hearing loss (NIHL). NIHL can be caused by a one-time exposure to loud sound as well as by repeated exposure to sounds at various loudness levels over an extended period of time.<sup>iii</sup>

#### What can be done to reduce the hazard from noise?

Noise controls are the first line of defense against excessive noise exposure. The use of these controls should aim to reduce the hazardous exposure to the point where the risk to hearing is eliminated or minimized.

1. **Engineering controls** that reduce sound exposure levels are available and technologically feasible for most noise sources. Engineering controls involve modifying or replacing equipment, or making related physical changes at the noise source or along the transmission path to reduce the noise level at the worker's ear.
  - Choose low-noise tools and machinery (e.g., Buy Quiet Roadmap (NASA)).
  - Maintain and lubricate machinery and equipment (e.g., oil bearings).
  - Place a barrier between the noise source and employee (e.g., sound walls or curtains).
  - Enclose or isolate the noise source.
2. **Administrative controls** are changes in the workplace that reduce or eliminate the worker exposure to noise. Examples include:
  - Operating noisy machines during shifts when fewer people are exposed.
  - Limiting the amount of time a person spends at a noise source.
  - Providing quiet areas where workers can gain relief from hazardous noise sources (e.g., construct a sound proof room where workers' hearing can recover – depending upon their individual noise level and duration of exposure, and time spent in the quiet area).
  - Restricting worker presence to a suitable distance away from noisy equipment.

#### What can be done if engineering and administrative controls are not enough?

Proper Selection and Use of Hearing Protection If other control strategies to reduce noise levels can't be used or fail to reduce noise levels below

OSHA's permissible exposure limits (PELs), wear a hearing protective device (29CFR 1926.52).

**Hearing protection devices (HPDs)**, such as earmuffs and plugs, are considered an acceptable but less desirable option to control exposures to noise and are generally used during the time necessary to implement engineering or administrative controls, when such controls are not feasible, or when worker's hearing tests indicate significant hearing damage.

### HAZARDS OF Hearing protection devices (HPDs)

Earplugs are meant to block out noises, but will not completely prevent you from hearing loud sounds. Earplugs block the outward flow of earwax that our bodies naturally produce in order to self-clean the ears. Foam plugs are often pushed in too far, which can also pack the wax deep inside your ear canal, and possibly against the eardrum. You'll end up with constant ringing of the ears (tinnitus), pain, or hearing loss. What's more not to gross you out earplugs? Using store-bought foam earplugs that don't fit your ear perfectly can also irritate the skin, another cause of infection.<sup>iv</sup>

### KARNAPOORANA:-

*Aacharya Charaka* and *Aacharya Vagbhata* advocate that *Karna Poorana* should be done daily to avoid the diseases of the ear. *Aacharya Sushruta* also has mentioned *Karna Poorana* in *Swasthavritiya Adhyaya*. *Karnapoorana* is a complete solution for any kind of ear problems<sup>v</sup> and it's really a unique treatment of Ayurveda.

- Types: Though not mentioned clearly, *Karna Poorana* can be classified in this manner,
  - According to use:-
    - A. As daily procedure (*Dincharya*)
    - B. In pathological conditions
  - According to Dravya used:-
    - A. Done with *Taila* or *Ghruta*.
    - B. Done with *Swarasa*
  - Dravya:-
    - Mutra, Sneha, Swaras*
  - Indications:-*Manyagraha, Hanugraha, Hanushula, Manyashula, Shirahshula, Karna Shula, Badhirya, Karna Nada, KarnaSrava, Pooti Karna* etc.
  - *Matra* (Quantity of Dravya):-

Not mentioned specifically. But it should be the quantity which fills the EAC without overflowing.

➤ Duration for procedure:

- In *Karna Roga* –100 *Matra*
- In *Kantha Roga* –500 *Matra*
- In *Shiro Roga* – 1000 *Matra*
- In painful condition - Till pain relives.
- In *Swastha* - Hundred *Matra* (approx. 2 – 3 minutes) (A.F.I. PART -I, II Common appendices.)

### Procedure:

➤ *Purva Karma*:-

Patient should be made to lie down on lateral side apposite of affected ear and hand of that side should be beneath head and other hand should be resting on trunk of that side.

- Gentle massage should be done with luke warm medicated oil around the ear and pinna for a short duration of time (Approx.5-7 min.s). Massage should also cover lateral portion of neck inferior to ear.
- After this heat is applied around ear with towel soaked in boiling water by waving, touching and pressing for some time (Approx.10 min.).

➤ *Pradhana Karma* :

- The medicated liquid (oil) should be heated in water bath to make luke warm.
- The external auditory canal should be straightened by pulling the pinna backward, and upwards.

### Ayurvedic Review

- The liquid (oil) should be poured in drop still the ear canal is filled up to the base of concha.
- The root of ear should be gently massaged in order to potentiate the action of the drug.
- The medicated oil should be retained in same position for prescribed time limit.

➤ *Pashchata Karma*:

- The excess oil should be taken out of the external auditory canal by dry cotton.
- After retaining the medicated oil for the prescribed time, the ear should be cleaned with dry cotton mopping. In bilateral case, the same

Procedure should be repeated in the fellow ear also.

### DISCUSSION:

Sound pressure is measured in decibels (dB). Like a temperature scale, the decibel scale goes below zero. The average person can hear sounds down to about 0 dB, the level of rustling leaves. Some people with very good hearing can hear sounds down to -15 dB. If a sound reaches 85 dB or stronger, it can cause permanent damage to your hearing. Damage happens to the microscopic hair cells found inside the cochlea. These cells respond to mechanical sound vibrations by sending an electrical signal to the auditory nerve. Different groups of hair cells are responsible for different frequencies (rate of vibrations). The healthy human ear can hear frequencies ranging from 20Hz to 20,000 Hz. Over time, the hair cell's hair-like stereo cilia may get damaged or broken. If enough of them are damaged, hearing loss results. The high frequency area of the cochlea is often damaged by loud sound.

### Refraction of Sound Waves

Refraction of waves involves a change in the direction of waves as they pass from one medium to another. Refraction, or bending of the path of the waves, is accompanied by a change in speed and wavelength of the waves. So if the media (or its properties) are changed, the speed of the wave is changed. Thus, waves passing from one medium to another will undergo refraction. Refraction of sound waves is most evident in situations in which the sound wave passes through a medium with gradually varying properties. For example, Sound waves travel slower in cooler air than they do in warmer air.

### EFFECTS OF KARNAPOORANA :-

- *Karnapooran* reduces the frequency of sound by reflecting and refraction the sound. Because sounds frequency and pressure change from one medium (air) to another (oil or liquid) thus its frequency reduces and disabes decrease by *Karnapoorana*.
- According to Ayurveda karna is a location of vata and akash mahabhoota , oil reduce the rukshta of vata and create a media

that's why sound frequency can be decrease.

- Smooth walls have a tendency to direct sound waves in a specific direction *Karnapooran* also smoothing the inner wall.
- It helps to maintain the cilia of inner ear cells which are responsible for hearing.
- *Karnapooran* also helps to remove the wax and also protect ear from fungus and many other diseases.

### CONCLUSION:

According to modern, loud noise damaged the capacity of hearing and also causes permanent hearing loss. For prevent from NIHL some device are advised but till it has some hazards. According to above discussion *Karnapooran* is effective and safer for NIHL. Oileation helps to maintain of vata disharmony which is one of main cause of NIHL. *Karnapooran* is one of the best aspects for prevention for Noise-induced hearing loss (NIHL).

### REFERENCES:

<sup>1</sup> Astang hridaya, by sri harinarayan Sharma, edition; 2008, published by chaukhambha vishva bharti , Varanasi.

<sup>1</sup> [www.ncbi.nlm.nih.gov](http://www.ncbi.nlm.nih.gov)

<http://www.netdoctor.co.uk/ask-the-expert/ear-nose-and-throat/a67/can-earplugs-be-harmful/>

<http://www.popsugar.com/fitness/Can-Prolonged-Earplug-Use-Cause-Damage-Ears-8872394>

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