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Concept of *Lashunadi Taila Karnpooran* as an adjunctive in treating Hearing Loss (*Badhirya*)

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ABSTRACT

The World Hearing Day, observed on March 3rd every year to raise awareness on how to prevent deafness and hearing care across the world. Over 5% of the world's population- 466 million people have disabling hearing loss. It is estimated that by 2050 over 900 million people or one in every ten people will have disabling hearing loss. In India, Nationwide disability surveys have estimated hearing loss to be the second most common cause of disability. This statistical data emphasises the need for strengthening disability statistics in the world. In Ayurveda, Hearing loss or impairment can be correlated with *Badhirya* due to marked similarities of the clinical presentations of these two diseases. Lot of research work have already been done at various institutes of Ayurveda regarding *Badhirya*. *Karnapooran* is one of the best local treatment mentioned for all *Karnarogas* with large number of preparations, but among all only few are popularly used in clinical practice. *Lashunadi Taila* is one among the preparations mentioned in context to *Badhirya*, on which no study has been conducted so far. With the aim of unveiling the treasures of *Lashunadi Taila* and providing better relief to the patient, present review study has been compiled.

Key words: Deafness, Hearing Loss, Impairment, *Badhirya*, *Lashunadi Taila*, *Karnpooran*.

INTRODUCTION

The World Hearing Day, observed on March 3rd every year, is an initiative aimed to raise awareness on how to prevent deafness and hearing care across the world. According to WHO definition, "A person who is not able to hear as well as someone with normal hearing – hearing thresholds of 25 dB or better in both ears – is said to have hearing loss". Hearing loss

may be mild, moderate, severe, or profound. It can affect one ear or both ears, and leads to difficulty in hearing conversational speech or loud sounds. Hearing loss may result from genetic causes, complications at birth, certain infectious diseases, chronic ear infections, the use of particular drugs, exposure to excessive noise, and ageing "Deaf people mostly have profound hearing loss, which implies very little or no hearing. They often use sign language for communication".^[1] The interchangeable term of Hearing loss in Ayurveda is *Badhirya*. As the word *Badhirya* itself has a meaning in it '*Badha*' which means obstruction. Any obstruction in the conduction of sound waves from external environment upto hearing centre in brain, leads to *Badhirya* (hearing impairment). Hearing loss is partial or complete inability to receive and interpretation of sound stimuli in unilateral or bilateral Ear.

Classification: On the basis of its pathogenesis, Hearing loss is categorized into Conductive,

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Sensorineural and mixed.

- 1) **Conductive Hearing loss:** It is caused by anything that interferes with the transmission of sound from the outer to the middle ear.
- 2) **Sensorineural hearing loss:** It is due to damage to the pathway for sound impulses from the hair cells of inner ear to the Auditory nerve & the Brain.
- 3) **Mixed hearing loss:** It is due to both conductive & sensorineural hearing loss.

Prevalence Rate:^[1]

- According to WHO, Over 5% of the world's population, or 466 million people – has disabling hearing loss (432 million adults and 34 million children).
- It is estimated that by 2050 over 900 million people – or one in every ten people – will have disabling hearing loss.
- 1.1 billion young people (aged between 12–35 years) are at risk of hearing loss due to exposure to noise in recreational settings.
- Unaddressed hearing loss poses an annual global cost of 750 billion international dollars.
- As per census 2011, conducted by (MOSPI) Ministry of Statistics and Programme Implementation, Government of India, in India itself, out of the 121 Cr population, about 2.68 Cr persons are 'disabled' which is 2.21% of the total population. 19% of the total disability rate, hearing loss is the 2nd most highest with the prevalence rate higher in males than in females.^[2]

Impact of Hearing Loss (Acc. to WHO fact files)

Exclusion from communication can have a significant impact on everyday life, causing feeling of loneliness, isolation, and frustration, particularly among older people with hearing loss. One of the main impacts of hearing loss is on the individual's ability to communicate with others. Management of individuals

with hearing impairment can be determined by the degree of hearing impairment, irrespective of whether the impairment is sensorineural, conductive or mixed. Thus in case of mild, moderate or severe impairment, hearing aids are the main options. In profound or total hearing loss, cochlear implants are the most appropriate management strategy. With the available medical treatment the complete cure of this condition is not possible except rehabilitation and the cost of the equipment is unaffordable by the middle and lower class population. This creates a necessity to evolve an alternative management for hearing impairment. It is need of time to find out a herbo-mineral Ayurvedic preparation which is effective to combat the disease, free from preservatives and also cost effective.

Ayurvedic Review

The detailed description about the disease *Badhirya* is available in *Brihatrayees* and *Laghutrayees* of *Ayurvedic* classics. *Acharya Charak* has subdivided the *Karna rogas* into four groups based on the predominance of *Dosha - Vataja, Pittaja, Kaphaja* and *Sannipataja Karnarogas*. On the basis of *Doshas*, *Badhirya* is one of the symptoms of *Vataja Karna Rogas*. This condition is mainly characterized by *Srotorodha* due to predominance of *Vata* or *Vata Kapha Dosha*.^{[3],[4]}

Pathophysiology (Samprapti)

In *Nidaanstan*, *Acharya Sushruta* has mentioned that vitiated *Vayu* or *Kevala Kapha* initiates the pathology of *Badhirya* by obstructing the *Shabdavaha Srotas*. Whereas, in *Uttartantra*, *Acharya Sushruta* has mentioned that *Kapha* accompanies *Vata* throughout the *Samprapti* of *Badhirya*. The *Shudha* or *Kevala Vayu* accompanied by *Kapha* initiates the pathology of *Badhirya* which can be understood in the following way - Due to the various etiological factors favouring vitiation of *Vata* and *Kapha*, *Vata* is being covered, hindered, or obstructed by *Kapha*. Because of the obstruction in the *Gati* of *Vata*, its activities will be hampered, which results in the improper conduction of sound (*Shabda-Agrahana*).

Treatment

- 1) **Samanya Chikitsa:** Samanya Chikitsa of all Karna rogas is mentioned under one Chikitsa Sutra,^[5] in which Acharya advises Ghritapana and Rasayana Sevana in all Karna Rogas. Whereas by considering the Doshik status, Vatavyadhi Chikitsa and Vataj Pratisyaya Chikitsa can be appropriately administered in Badhira.^{[6],[7]}
 - Vatakshya Upakrama is to be followed.
 - Vataja Pratisyaya Chikitsa.
 - Nidana parivarjana.
 - Oral intake of Ghee with Luke warm milk especially at night.
 - Regular usage of Rasayana Yogas.
 - Taking rest or avoiding excessive strain.
 - Avoiding head bath.
 - Absolute sexual abstinence.
 - Abstinence from talkativeness.
 - Advised to take Vatahara, Kaphahara Ghritas at night.
 - Basti prayoga in the form of Anuvasana with Taila
- 2) **Vishishta Chikitsa of Badhira:** The disease Karnanada, Karnashula, Badhira and Karnakshweda have similar line of treatment.^[8] The main aim of treatment is elimination of Vata Dosha. Treatment includes,
 - Administration of Vata Hara treatment.
 - Administration of Snigdha Aushada.
 - Snigdha Virechana
 - Naadi and Pinda Sweda
 - Dhoopana with kshouma, Guggulu and Agaru.
 - Ghritapana and Rasayana.
 - Bala Taila in the form of Moordha Basti, Nasya, Mastishka Parisechana and for Bhojana.

Karnpooran

For the treatment of Karna Rogas, Karnpooran is one of the basic treatment mentioned in Ayurvedic literature. While describing Dincharya, Acharya Charaka has described importance of regular practice of Karnpooran, avoiding occurrence of diseases of ear. Acharya Charak has mentioned Karnpooran as one of the daily regime which is effective in treating Vatajanya Rogas including Manyagraha, Hanugraha and Badhira.^[9]

MATERIAL AND METHODS

For the present review, detailed literary study has been compiled from various Ayurvedic Samhitas, modern literature, internet etc. Lashunadi Taila^[10] is one of the compound preparation mentioned in context to Karna Badhira. At many centres in country a useful work on the efficacy of various drugs in Badhira has been done but no work has been carried out on Lashunadi Taila. For any clinical research the complete literature of the subject is the basic prerequisite, so detailed study of the drug is mentioned in (Table 1).

Preparation

The method of preparation of Lashunadi Taila is mentioned in Bhaisajyaratnavali. It is prepared by standard Sneha Kalpana method taking Kalka: Sneha: Drava in the ratio of 1:4:16.^[11]

- Kalka Dravya (Lashun : Amla : Hartaal = 1:1:1) 83.3 gm each → 250 gm
- Murchhit Tila Taila → 1 litres
- Go-Dugdha → 4 litres
- Jala (Water) → 4 litres

Method

Individually, Drugs should be identified first and Patra Hartaal should be taken, as it is best in medicine preparation. For its Shodhana, it is to be done in Kushmanda Swaras by Dolayantra method for 3 hours.^[12] Then it is to be kept in quicklime powder Ca(OH)₂ and after that, in Triphala Kashaya for 6 hours each. After purification, Yava Koot Churna of Hartaal

is mixed with *Yava Koot Churna* of *Amla* and *Lashun* to form a *Kalka* (paste) by adding small amount of water in it.

Kalka is to be mixed in *Murchhit Tila Taila*, which is already prepared by standard method of *Taila Paka* mentioned in *Bhaisajratnavali*.^[13] Then it is boiled on *Mridu Agni* and stirred well continuously, so that *Kalka* could not stick to the vessel. *Go Dugdha* and *Jala* are added to it. It is heated on mild to moderate *Agni* for one *Prahar* (3 hours) and then allowed to stand overnight. Next day, same heating process is to be continued. Keep checking for *Phena Utpatti*.^[14] The process is continued until *Smyaka Paka Lakshnas* (*Khar Paka*)^[15] are obtained. When *Kalka* starts becoming hard, stop the process thereby checking it to get burnt. It should be filtered with four fold cloth and preserved in glass container.

PHYSICO-CHEMICAL PARAMETERS

The prepared *Lashunadi Taila* is analyzed for the physical and chemical parameters (Table 2) in the Patanjali Research Institute, Haridwar. Following parameters with value are given below (According to API, Part-II, Vol-III, 2010).

Table 1: Contents of Lashunadi Taila

Name	Botanical Name/ English Name	Parts used	Quantity
<i>Lashun</i>	<i>Allium Sativum</i>	Bulb	1 Part
<i>Amalaki</i>	<i>Phyllanthus emblica</i>	Fruit	1 Part
<i>Hartaal</i>	Orpiment	Mineral Ore	1 Part
<i>Tila taila</i>	<i>Sesamum indicum</i>	Seed oil	4 Parts
<i>Go-dugdha</i>	Cow milk	Milk	16 parts

Table 2: Physical* and Chemical parameters of Lashunadi Taila.

Parameters	Units	Lashunadi Taila
Weight/ml	gm/ml	0.883

Acid value	-	6.63
Peroxide value	mEq/L1000 gm of oil	3.38
Iodine value	-	127.03
Saponification value	-	184.62

**Lashunadi taila*: Reddish orange colour with characteristic odour

Table 3: Pharmacodynamic properties of various ingredients of Lashunadi Taila.

Dravyas	Rasa	Guna	Veer ya	Vipaka	Doshghnt a
<i>Lashun</i> ^[16]	<i>Amla varjit Panchar asa</i>	<i>Tikshna, snigdha, guru, sara</i>	<i>Ushna</i>	<i>Katu</i>	<i>Vata Kaphaghna</i>
<i>Amalaki</i> ^[17]	<i>Lavana varjit Panchar asa</i>	<i>Ruksha, laghu, sara</i>	<i>Sheeta</i>	<i>Madhura</i>	<i>Tridoshaghna</i>
<i>Hartaal</i> ^[18]	-	<i>Snigdha</i>	<i>Ushna</i>	<i>Katu</i>	<i>Kaphaghna</i>
<i>Tila taila</i> ^[19]	<i>Madhura, kashaya, tikta, katu</i>	<i>Guru, snigdha</i>	<i>Ushna</i>	<i>Katu</i>	<i>Vataghna</i>
<i>Go-dugdha</i> ^[20]	<i>Madhura</i>	<i>Guru, snigdha</i>	<i>Sheeta</i>	<i>Madhura</i>	<i>Vata-Pittaghna</i>

DISCUSSION

Probable mode of action of Trial drug

Badhira is *Vata-Kapha* dominant disease, so the selection of formulation should possess *Vata-Kaphanashak* properties to counteract the vitiated *Doshas*, thereby disintegrating the pathology of the disease. In *Ayurveda*, the probable mode of action of the drug is based upon the pharmacodynamics of the

drug, which includes *Rasa*, *Guna*, *Veerya*, *Vipaka* and *Prabhava*.

In *Lashunadi Taila* (Table 3), majority of the ingredients have *Madhura* (27%) and *Katu-Tikta-Kashaya Rasa* (20% each), *Snigdha Guna* (29%), *Ushna Veerya* (60%), *Katu Vipaka* (60%) and *Vata* (44%)–*Kapha* (33%) *Rogaghnta*. *Madhura Rasa* and *Snigdha Guna* being predominant, helps in the *Anuloman* of *Vata* whereas *Katu-Tikta-Kashaya* has *Kaphanashak* property, thus helpful in disintegrating the *Kapha Sanga*, which clearly acts on the pathogenesis of *Badhriya*. All ingredients together possess *Balya*, *Brihmna*, *Rasayana*, *Shoolaghna*, *Shothahara* and *Krimiaghna* property which disintegrates the various etiological factors that lead to *Badhriya* (Hearing loss).

As majority of the ingredients in *Lashunadi Taila* have *Ushna Veerya* (60%) and *Katu Vipaka* (60%) properties, they produce *Dravikaran* (*Vilayana*) and *Chedana* of vitiated *Kapha*. *Madhura Rasa* and *Snigdha Guna* properties are also helpful in the nourishment of *Dhatu*s, in case of any degenerative changes occur in the inner ear. Thus from the above description of various ingredients of *Lashunadi Taila*, the overall effect seems to be *Vata-Kapha Shamaka*, *Ushna Veerya* and *Katu Vipaka*.

Garlic (*Lashun*) extract Allicin,^[21] which was first chemically isolated in the 1940's, has antimicrobial effects against many viruses, bacteria, fungi and parasites. It has abundant sulphur containing amino acids and other compounds that seem to initiate increased activity in the immune system, hence a good immunomodulator. Studies conducted on animals have shown improvement in brain function after eating garlic. It is possible that antioxidants in garlic neutralize and destroy the free radicals which have accumulated in the body.^[22]

Pharmacological research reports on *Amlaki* reveal its analgesic,^[23] Anti-microbial,^{[24],[25]} neuro-protective,^[26] immunomodulatory,^[27] free radical scavenging,^[28] antioxidant,^[29] Anti-viral^[30] and anti-inflammatory^[31] properties. These properties are efficacious in the prevention and treatment of various diseases. *Amla* is one of the richest sources of vitamin-C and low

molecular weight hydrolysable tannins which make *Amla* a good antioxidant.

From ancient times, Arsenic (*Hartaal*) and arsenic salts were key ingredients in antiseptics, antispasmodics, hematinics, sedatives, ulcer, cancer etc. and Arsenical preparations, such as Fowler solution (1% potassium arsenite), were used by many physicians in the treatment of malignant diseases such as leukemia, Hodgkin's disease and pernicious anemia as well as non-malignant diseases such as psoriasis, pemphigus, eczema, and asthma for centuries (Miller et al., 2002; Evens et al., 2004).^{[32],[33]} It has traditional and historical use in Cancer, skin diseases, bald head scab, disinfectant, antispasmodics, psoriasis was quoted by Liu et al. in Table 1. It also acts as a nervine tonic.^[34]

Tila Taila: It is an antioxidant as it contains vitamin E and penetrates skin easily. This oil is rich in minerals (Copper, calcium, zinc, iron). Magnesium supports vascular health, thus helps in blood circulation around ears. Terpenoid presence gives antibacterial property. Alkaloids are central nervous system stimulants. Flavonoids and phenols give it antioxidant properties, also saponins which are antioxidant, anti-cancer and immunity booster. Tannin present in oil makes it antibacterial, antiviral, and astringent. Antimicrobial study on sesame oil shows Methanolic seed extract of *S. indicum* at concentration 500 mg/ml showed a maximum diameter of inhibition zone for *S. aureus* 13+0.871 mm while for *E. coli* maximum zone of inhibition observed was 10.17+0.946 mm. It also has antibacterial effects against common skin pathogens such as *Staphylococcus* and *Streptococcus*, as well as anti-fungal, anti-viral and anti-inflammatory effects.^[35] As an analgesic and anti-inflammatory, it is useful for the treatment of ear ache and secretions from ears.^[36]

Go-ksheer:^[37] It is a rich source of vitamins like B2, B3 and vitamin A which help in increasing immunity. It is a good source of zinc, which is required for synthesis of insulin by the pancreas and for immunity function. It also has anti-microbial effect, the substances in milk which are responsible are immunoglobulins,

lactoferrin, lysozyme, lactoperoxidase and vitamin B12-binding protein. It is one of the best natural antioxidants and thus neutralizes the oxidative stress produced in body through action on free radicals. It also acts as an immunomodulator.

All ingredients in the *Lashunadi Taila* has anti-inflammatory and anti-microbial effect, thereby helps in all kind of inflammation and infection related to external, middle or inner ear. They also have antioxidant property which destroy the free radicals which have accumulated in the tissues of body as well in nervous tissues which helps in nourishing the nerve cells, thereby improves the nerve functions of ear. They also contain immunomodulators, which boost up the immunity against all diseases and also help in nourishing the degenerative changes in any part of the ear, thereby helps in rejuvenating the auditory centres in brain and helps in auditory functions of the ear.

Probable mode of action of Karnpooran

Snehana is the principle line of treatment for controlling *Vata*. *Karnpooran* is a type of *Bahya Snehana*. Thus it is a best treatment for *Vata Nigraha*. *Acharya Charaka* has mentioned that *Vata Roga* doesn't stay in *Koshta* which is softened by *Snehana*.

In *Badhriya*, *Vata* becomes *Vimargaga* in *Shabdavaha Srotas*. The *Vimarga Gamana* could be due to *Prakopa* of *Vata* or obstruction by *Kapha*, and the end result is *Badhriya*. By doing *Karnpooran*, it relieves the obstruction in *Shabdavaha Srotas* and controls the *Vata*.

Detail description regarding mode of action of *Karnpooran* is not available in our Ayurvedic texts but *Karntaila* (i.e. *Karnpooran*) is mentioned under 24 *Sneha Pravicharana*,^[38] so its mode of action can be understood as *Sthanik Snehana*, only if, *Sneha Dravya* is used in this process. In *Karnpooran*, *Sthanika Snehana* and *Swedana* increases the blood supply and helps absorption of the drug.

Abhyanga is specifically done in the *Murdha Pradesha*. The effect of *Abhyanga* can be assumed in two ways i.e.,

1. Physical manipulations, and
2. The effect of the drug in the medicated oil.
 - Physical manipulation in the form of massage stimulates the receptors of the sympathetic nervous system which causes vasodilatation in skin and muscles. It increases the circulation of blood and plasma, thereby stimulate and strengthening the lymphatic system and remove internal waste products.
 - The strokes used in *Abhyanga* like kneading and friction also have effects like;
 - Increase in flow of circulation to the local area treated.
 - Reduction of tone in muscles which are in a state of excess tension.
 - Relief in pain is obtained by releasing acute or chronic tension in muscles and by affecting pressure and touch nerve endings.
 - *Abhyanga* with *Tila Taila* alleviates *Vata*, at the same time doesn't aggravate *Kapha*. It has *Ushna*, *Tikshna* and *Vyavayi Gunas*, so it has good capacity to penetrate through small channels in the body so that it will open the obstructed path (channels or *srotas*) and facilitate the drainage of vitiated *Doshas*.
 - *Acharya Sushruta* described the mode of action of *Abhyanga* etc. *Bahya Snehana* as follows - The *veerya* of drugs present in *Abhyanga*, *Parisheka*, *Avagaha*, *Lepa* etc. are absorbed into the skin and then digested by *Agni* (*Bhrajaka pitta*).^[39]

Commentator *Dalhana* also explained about the absorption of *Sneha* used in *Abhyanga* procedure. According to this, the oil used in *Abhyanga* can reaches upto the different *Dhatu* if applied for the sufficient time. Hence, it is clear that the potency of drug used in oil gets absorbed by the skin.

- *Acharya Dalhana* also mentioned that when *Snehana* drug reaches to particular *Dhatu*, it subsides or cures the diseases of that particular *Dhatu*. *Acharya Sushruta* has mentioned that *Sneha* used in *Avagahana*, through *Siramukha*

(opening of the veins), *Romakupa* (root of the hairs) and *Dhamani* (arteries) nourishes the body and thus provides strength.^[40] Same can be understood for *Abhyanga* which is also a type of *Bahya Snehana*.

- Instilled medicine effect (*Lashunadi Taila*) in ear canal gets absorbed by the skin lining through epithelial tissue of external ear canal, tympanic membrane and through systemic blood flow. The medicine (*Lashunadi Taila*) used should be luke warm and by counter effect of heat, helps in relieving the inflammation thus it reduces ear ache and pain in adjacent areas.
- Patient is asked to do chewing movements during the procedure. Chewing movements and *Karnmoola Vimardan* facilitates good absorption of drug.
- According to *Ayurveda*, drugs get absorbed by *Bhrajaka Pitta* present in the skin and from there drug is spread in to the deeper tissues through (*Rasa and Rakta*) *Shabdavaha Sira*.
- According to *Kedarikulya Nyaya*, Blood supply will improve in ear first and then, later on the adjacent structures.
- *Lashunadi Taila* has predominant *Snigdha Guna* (29%), *Ushna Veerya* (60%), *Katu Vipaka* (60%) and *Vata* (44%) - *Kapha* (33%) *Rogaghnta* which is mentioned below under discussion on trial drugs, as a result of this *Kapha* and *Vata Shamana* takes place which will correct the microcirculation in ear and maintains the normal function of hearing and thereby, relieves *Badhirta* (*Badhira*). The whole process can be better understood by the flow diagram (Figure 1).

CONCLUSION

Hearing loss (*Badhira*) is a great, social and educational handicap. *Badhira* is a disease of the ear initiated by *Vata* and *Kapha* which when get chronic, results in complete hearing loss. In modern science, treatment includes medicinal, surgical and hearing aids. The cost of Hearing aids and Surgery is not affordable to middle and lower section of the society.

So all these above facts leave a scope to find out better solution for the disease *Badhira* from amongst the medical heritage of traditional Indian System of medicine as a better answer to the problem. Hence, this literary review has been preferred, as no exploration regarding *Lashunadi Taila* has been done so far in treating *Badhira*.

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