

Concept of Otorrohea and its Management in Ancient India: An Overview

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Abstract: *Otorrhoea i. e., discharge from the ear is a common clinical feature of ear diseases and remains a major public health issue with high healthcare utilization, associated costs, and a reason of serious concern, particularly in children, because it may have long - term effects on early communication, language development, auditory processing, educational process, and physiological and cognitive development. The conventional treatment modalities for otorrhoea have their drawbacks and limitations and also, they do not cure the disease permanently in all cases. Ayurveda, the ancient Indian system of medicine describes otorrhoea as Karnasrava and treats it successfully since antiquity. The various management strategies used to treat Karnasrava are explained in classical Ayurvedic texts. This article presents the conceptual analysis of Karnasrava and its management in ancient India. An integrative disease management strategy, combining Ayurveda and conventional medicine, would be the prerogative for the successful management of otorrhoea.*

Keywords: Ayurveda, Karnasrava, Karnaprasshalana, Karnapichu, Otorrhoea

1. Introduction

Otorrhoea, characterized by the discharge from the ear, represents a prevalent clinical manifestation of various aural afflictions. The origins of otorrhoea primarily stem from both the ear canal and the middle ear. The discharge itself may exhibit considerable variation in its volume, ranging from copious to meager, while its hue can span the spectrum from transparent to yellowish, green, or even tinged with blood. The nature of the discharge may manifest as purulent, mucopurulent, or mucoid, with its consistency being lighter or thicker depending on many factors. Frequently, the presence of otorrhoea is concomitant with the perforation of the tympanic membrane and engagement of osseous structures. In the case of persistent otorrhoea, there may be a progressive destructive disease of the middle ear and mastoid structures and it results in hearing impairment or deafness. Long - term hearing impairment affects the overall intellectual, linguistic, psychosocial, and cognitive development of an individual. Children with hearing impairment suffer from learning disabilities and poor scholastic performance and are not able to achieve according to their potential [1].

Conventional therapeutic modalities for the management of otorrhoea encompass methods such as aural toilet, systemic administration of antibiotics, topical application of antibiotic - antiseptic ear drops, and surgical interventions. Emerging antibiotic resistance and the potential ototoxic effect of antibiotic use are major disadvantages of conventional therapy [2]. There have been several case reports of sensorineural hearing loss, tinnitus, and dizziness in humans following the administration of antibiotics and antiseptics ear drops [3]. Furthermore, the cost - effectiveness of conventional regimens in developing nations, particularly within socioeconomically disadvantaged strata, presents a formidable challenge. Additionally, the recurrence rate of

otorrhoea with conventional therapy is also not low and the chances of the spread of extracranial and intracranial infection cannot be denied. Surgical interventions, though undertaken with deliberation, carry inherent risks, while their outcomes may not invariably attain the desired level of satisfaction across all cases, and they do not eliminate the risk of recurrence and hearing impairment [2].

Ayurveda, the ancient Indian system of medicine, encapsulates the concept of otorrhoea as "Karnasrava." *Karnasrava* is documented both as an autonomous malady and as a concomitant symptom of ear diseases in the classical Ayurvedic texts. *Karnasrava* has been efficaciously addressed within Ayurvedic tradition since antiquity. The multifarious strategies elucidated within classical Ayurvedic literature form the substratum of therapeutic approaches to mitigate *Karnasrava*. The present article proffers a conceptual elucidation of *Karnasrava* along with a discussion of its historical management within the context of ancient Indian medical knowledge.

2. Objective of the Study

The global recognition of ancient India's substantive contributions to the realm of medical interventions remains underacknowledged. This comprehensive assessment aims to enhance readers' understanding of the various healing techniques used in ancient Indian medicine to address otorrhoea. These diverse procedures and methods can complement conventional treatment strategies, potentially offering a more effective and holistic approach to managing otorrhoea.

3. Karnasrava

The term *Karnasrava* is a combination of two words "Karna" and "Srava". The term "Srava" etymologically

originates from the root "Sri," with the addition of the prefix "Sama," implying the act of "Sraavit" or releasing. "Karnasya karnayorva samsravaha" i. e., discharge from the ear is known as *Karnasrava* [4].

3.1 Causative factors (Nidana) of Karnasrava

In various Ayurvedic texts, several factors are outlined as the causes of *Karnasrava* (discharge from the ear).

3.1.1 Avashyaya

Avashyaya i. e., exposure to humid conditions is mentioned as the causative factor of *Karnasrava* [5]. This exposure can lead to an imbalance in the *Kapha dosha*, resulting in the manifestation of *Pratishyaya* (common cold). In contemporary understanding, it is recognized that a cold can trigger inflammation in the nasopharynx, potentially causing infections in the sinuses, adenoids, and tonsils. This cascade of events can subsequently lead to inflammation in the nasopharyngeal end of the eustachian tube, culminating in a middle ear infection, also known as otitis media. This infection gives rise to clinical features such as otorrhoea (*Karnasrava*), accompanied by various other signs and symptoms. Aacharya Vagbhata has modified the original causative factor "Avashyaya" to "Pratishyaya" (cold), considering it as the primary trigger for *Karnasrava* [6].

3.1.2 JaIa - krida

Jala - krida, as mentioned in Ayurvedic texts, constitutes another contributing factor to *Karnasrava* [5]. Engaging in water - related activities such as swimming, deep - sea diving, bathing in rivers, ponds, fountains, or even water sprinkling can lead to the entry of water into the external auditory canal. This entry of water may trigger various symptoms in the ear due to several reasons.

Bathing in contaminated water introduces microorganisms such as bacteria and fungi into the ear, potentially leading to otitis externa or otitis media, which can culminate in *Karnasrava*. In cases where a perforation of the tympanic membrane exists, it may induce inflammation of the middle ear mucosa, resulting in an active state of chronic otitis media.

Additionally, water entering the external ear during activities like river or sea bathing can lead to the moistening of earwax. The dampened wax can then swell and obstruct the ear canal, causing symptoms such as hearing impairment. The pressure exerted by the swollen wax on the tympanic membrane can lead to sensations of dizziness, vomiting, tinnitus, ear pain, and more.

Frequent diving into water can subject the tympanic membrane to sudden air pressure changes. This abrupt pressure alteration increases the risk of tympanic membrane rupture. Following the development of a perforation in the tympanic membrane, the likelihood of middle ear infections significantly rises. Infections originating in the external ear facilitate the easy entry of microorganisms into the middle ear, thereby fostering the development of otitis media and ultimately leading to *Karnasrava*, characterized by otorrhoea or discharge from the ear.

3.1.3 Karnakandu

Ayurveda delineates *Karnakandu*, which pertains to the sensation of itching within the ear, as a contributory factor to *Karnasrava* [5]. In response to this itchiness, an individual may introduce objects like sticks, grass, sharp metals, and the like into the ear canal. Such actions can lead to the onset of *Karnasrava* through distinct mechanisms.

These objects often lack sterilization, and any resulting trauma from their use can lead to abrasions or erosion within the external ear canal (EAC). Consequently, this may give rise to an infection in the EAC, culminating in otitis externa and the potential manifestation of otorrhoea.

In instances where a sharp object penetrates deeply, it could perforate the tympanic membrane. This perforation creates a pathway for microorganisms to easily infiltrate the middle ear from the external environment. This infiltration can subsequently trigger otitis media, with *Karnasrava* emerging as the primary symptom of this middle ear inflammation.

3.1.4 Mithyayogen Shastrasya

Improper manipulation of instruments by untrained individuals can lead to various complications, including external ear injuries or even the rupture of the tympanic membrane. Such instances are cited in Ayurvedic texts as contributing factors to ear - related ailments [5]. When these instruments are not adequately sterilized, the risk of infection escalates. Trauma inflicted on the ear by these instruments can occur either directly or indirectly. *Karnasrava*, or the discharge from the ear, can ensue as a consequence of this direct trauma, coupled with subsequent infections affecting the tympanic membrane and middle ear, all stemming from the improper use of instruments by untrained individuals. Furthermore, certain forms of indirect trauma, such as a blow to the ear, exposure to intense explosions from firearms, or experiences like diving into water or flying in an aircraft, can trigger sudden air compression within the ear canal. These factors collectively increase the likelihood of tympanic membrane perforation, inducing symptoms such as ear pain, hearing impairment, and even the discharge of blood from the ear.

3.1.5 Shirobhighata

Shirobhighata, which refers to head trauma, is highlighted in Ayurvedic texts as an additional element contributing to *Karnasrava* [7]. When the head experiences prolonged trauma or injury, there exists the potential for a fracture in the temporal bone. This fracture can lead to the emergence of a bloody discharge from the ear. In cases where the injury is situated within the middle cranial fossa, there is also the risk of discharge that includes cerebrospinal fluid (CSF). Furthermore, if a secondary infection takes hold, the ear discharge may evolve into a purulent state.

3.1.6. Prapaka

In most cases, *Paka*, characterized by an inflammatory condition, arises due to an imbalance in the *Pitta dosha*. This imbalance typically leads to sensations of burning (*Daha*), rapid suppuration (*Ashu pakam*), and the discharge assumes a yellowish hue (*Peeta lasika sruti*) from the ear. Consequently, various forms of inflammatory issues within the external ear can be categorized within the realm of

Prapaka. Acharya Vagbhata, indicates that when this discharged material comes into contact with the skin, it can incite inflammation. Thus, if this discharge exits the ear, it has the potential to induce inflammation in the surrounding skin of the ear [6].

3.1.7 Vidradhi

With a persistent imbalance of the *Pitta dosha*, the inflammatory process intensifies, ultimately giving rise to the formation of an abscess, known as *Vidradhi* [7]. Within this context, the occurrence of *Prapaka* involves the abscess reaching a state of fullness and subsequently rupturing. This rupture facilitates the drainage of accumulated pus. Consequently, this drainage manifests as a discharge, which can present as either a purulent discharge (*Puyasrava*) or a mixture of pus and bloody discharge from the ear.

3.2 Pathogenesis (Samprapti) of Karnasrava

In Ayurveda, it is held that diseases do not arise abruptly within a single day, but rather stem from a gradual and prolonged process. The term "*Samprapti*" is composed of "*Prapti*," preceded by the prefix "*Sama*," which signifies a thorough or complete progression. *Samprapti* is defined as the culmination of pathological alterations initiated by underlying causative factors, ultimately leading to the manifestation of a specific disease condition [8].

The *Samprapti* of *Karnasrava* can broadly be categorized into two groups: *Nija*, which originates due to the involvement of *Doshas* (fundamental bodily energies), and *Aaganujja*, which stems from external trauma or injury [8].

The *Nija Samprapti* (intrinsic progression) of *Karnasrava* can be elucidated through the framework of the *Shat - kriyakala*, which comprises six stages of disease management: *Samchaya* (accumulation), *Prakopa* (aggravation), *Prasara* (spread), *Sthana Samshraya* (localization), *Vyakti* (manifestation), and *Bheda* (differentiation) [9]. All the various causative factors, including both common causes (such as *Avashyaya/Pratishyaya*, *Jala - krida*, *Karnakandu*, and *Shastra mithya prayoga*) and specific factors relating to *Karnasrava* (like *Shirobhighata*, *Jale - nimajjanat*, *Prapakad*, *Karna vidradhi*, etc.), contribute to guiding the *Doshas* through these sequential stages of the *Shat - kriyakala* process.

During the *Samchaya Avastha*, the three *Doshas* (*Vata*, *Pitta*, and *Kapha*) accumulate in their specific locations, leading to generalized bodily symptoms. If the exposure to causative factors persists, the *Prakopa* stage ensues, during which *Doshas* become aggravated in their respective sites due to the specific causative factors. *Prakupita* (aggravated) *Doshas* then spread (*Prasara*) throughout the body. *Vata*, being responsible for *Dosha* movement, either alone or in combination with *Pitta*, *Kapha*, or *Rakta*, disperses throughout the body. In areas where there are abnormalities in the channels (*Srotas*), *doshas* accumulate and interact with tissues (*Dosha - dushya Sammurchhana*). This stage, known as *Sthana samshraya*, gives rise to generalized symptoms based on the *Dosha's* nature. For instance, *Pitta* can result in symptoms like burning, acidity, fever, and

smoke - like exhalation, while *Kapha* may lead to vomiting, heaviness, and so on [9].

Dosha - dushya Sammurchhana affects both physical and mental *Doshas*, further disturbing the body's tissues (*Dhatus*) and waste products (*Malas*), ultimately impacting the entire body. This phase is termed *Poorva roopa*, which serves as a precursor to the impending disease. *Doshas* that move and accumulate in the upper pathways of the body lead to ailments related to the nose, eyes, ears, mouth, and head. In the context of *Karnasrava*, *doshas* accumulate in the ear, leading to symptoms like ear blockage, heaviness, reduced hearing, earache, and fever, all of which can be considered *Poorva roopa* [9].

The expression of specific signs and symptoms constitutes the *Vyakta avastha*, the fifth stage in the disease progression, indicating the need for treatment [9]. In the case of *Karnasrava*, when the disease symptoms fully manifest, it is referred to as *Vyakta avastha*. Different types of *Karnasrava* are attributed to various *Doshas*: *Vataja Karnasrava* caused by *Vata dosha*, *Pittaja Karnasrava* or *Karnapaka* caused by *Pitta dosha*, *Kaphaja Karnasrava* caused by *Kapha dosha*, and so forth.

The *Bheda avastha* represents the stage of disease complication. Neglecting the disease even after the *Vyakta avastha* can lead to various complications [9]. In the context of *Karnasrava*, this stage may involve both extracranial and intracranial complications.

3.3 Types of Karnasrava

Based on causative factors, ear discharge (*Karnasrava*) may be of different natures like watery, mucoid, mucopurulent, purulent, and sometimes bloody. Ayurveda describes various types of *Karnasrava* (ear discharge) categorized based on their causative factors and the nature of the discharge [10] [6]. These types encompass:

Vataja Karnasrava: Characterized by Watery discharge or *Lasika Srava*.

Pittaja Karnasrava: Involves yellowish, foul - smelling (*Pooti*) *Srava* or yellowish *Lasika Srava*.

Kaphaja Karnasrava: Exhibits whitish thickened discharge or whitish *Ghana Srava*.

Raktaja/Abhigataja Karnasrava: Features a bloody or blood - stained discharge.

Sannipataja Karnasrava: Corresponds to a mixed discharge, where the color and thickness vary based on the *Dosha* predominance (white/black/red thickened pus discharge).

In the writings of Acharya Charaka, while describing 14 types of *Vrana Srava* (discharge from wounds), he mentions *Puya*, *Haridra*, and *Harita Srava*, which share similarities with the discharges found in *Karnasrava* [11].

3.4 Management of Karnasrava

Ayurveda has a long history of successfully managing ear discharge, referred to as *Karnasrava*, since ancient times. According to Ayurvedic literature, there are three conditions

associated with ear discharge: *Karnasrava* (ear discharge), *Putikarna* (foul - smelling ear), and *Krimikarna* (presence of maggots in the ear). These conditions are addressed using similar therapeutic principles [12].

3.4.1 Samanya Chikitsa of Karnasrava (General line of treatment of ear diseases)

According to Ayurvedic principles, the initial step in managing any disease is *Nidana Parivarjana*, which involves the removal of the factors responsible for the disease. Consequently, *Nidana Parivarjana* is regarded as a crucial component of the treatment protocol for *Karnasrava* [13].

Ayurvedic physicians like Charaka, Sushruta, and Vagbhata emphasize the significance of incorporating daily routines (*Dinacharya*), seasonal practices (*Ritucharya*), and adhering to specific measures during seasonal transitions (*Ritu - sandhi*) to prevent ear - related ailments. They advocate the regular practice of *Karnapoorana*, which involves filling the external ear canal with medicinal liquids, as a preventive measure against *Vata* - related ear disorders. Neglecting *Karnapoorana* can result in the accumulation of earwax, leading to issues such as *Karnakandu* (itching in the ear), *Karnashula* (ear pain), and *Badhirya* (hearing impairment) [14]. Ayurvedic texts also recommend daily oleation therapy (*Snehana*) for the neck, head, feet, and ears [15]. Sushruta advises individuals with ear diseases to undergo *Ghrita pana* (consumption of ghee) and *Rasayana* therapy while avoiding excessive physical exertion, head baths, sexual activity, and vocal strain [16].

Some therapeutic procedures for managing *Karnasrava* (ear discharge) are elaborated below:

(a) Snehana (Oleation therapy)

Ayurvedic scriptures delineate two approaches for administering *Snehana*: *Bahya* (external) *Snehana* and *Abhyantara* (internal) *Snehana*. These texts also identify four primary categories of *Snehana* substances: *Ghrita* (clarified butter), *Taila* (oil), *Vasa* (muscle fat), and *Majja* (bone marrow) [17]. Among these options, *Ghrita* is generally regarded as the most effective [18]. In the context of treating *Karna rogas* (ear disorders), external *Snehana* is typically carried out prior to *Swedana* (fomentation therapy).

(b) Nadi Sweda

Nadi Sweda is a vital form of *Vashpa Sweda* (steam therapy) within the category of *Saagni sweda* [19]. It involves the use of a nozzle or tube (known as *Nadi*) to direct steam onto a specific area of the body. Various herbs such as *Bilva* (*Aegle marmelos*), *Eranda* (*Ricinus communis*), *Arka* (*Calotropis procera*), *Punanava* (*Boerhavia diffusa*), *Dhattura* (*Datura metal*), *Shigru* (*Moringa Oleifera*), *Ashwagandha* (*Withania somnifera*), *Ajagandha* (*Cleome gynandra*), *Agnimantha* (*Premna Integrifolia*), *Yava* (*Hordeum vulgare*), and others are commonly used in this therapy. The affected area is exposed to steam generated from herbs boiled in a fermented drink [20]. *Nadi Sweda* is particularly beneficial for alleviating *Vata* imbalances in the affected region.

During this procedure, the affected area of the body is subjected to fomentation. The specified herbs, as mentioned earlier, are prepared in the form of coarse powder (*Yavakuta*

churna) and then boiled in a vessel containing *Kanzi*, which is a fermented drink. The mouth of the vessel is sealed, and a nozzle is fitted into a hole in the lid. This vessel is then positioned over a source of heat. The steam generated by this process is directed onto the affected part of the body. This *Vashpa Sweda* therapy is employed to alleviate *Vata dosha* specifically in the targeted area. It is crucial to carefully regulate the pressure of the steam throughout the procedure to ensure both its effectiveness and safety.

(c) Karnapoorana

In Ayurvedic literature, *Karnapoorana* is outlined as a daily practice to uphold optimal ear health and ensure proper ear function. It is also advised as a component of the general treatment (*Samanya chikitsa*) for various ear ailments [14]. The term "*Karnapoorana*" translates to "filling the ear," and it entails the introduction of lukewarm substances like *Taila* (oil), *Swarasa* (juice), medicated *Ghrita* (clarified butter), or *Gomutra* (cow urine) into the ear canal.

The procedure of *Karnapoorana* is carried out as follows: The patient is placed in a lateral (side - lying) position, and the chosen lukewarm substance is gently poured into the ear canal. The patient remains in this position for approximately 500 *matras*, which is roughly equivalent to ten minutes [21]. According to Vagbhata, following the administration of the substance, it is advisable to massage the base of the ear until any discomfort diminishes. Even in the absence of specific ear issues, the application of oil into the ear and retaining it for approximately 100 *matras* is recommended. This practice helps alleviate *Vata dosha* without aggravating *Kapha*.

Regarding the timing and administration of these substances, it is recommended that substances like *Swarasa* (juice) be administered before meals, while the application of *Taila* (oil) as *Karnapoorana* is advised to be done after sunset [21] [22]. Additionally, after performing *Karnapoorana*, *Swedana* (fomentation therapy) is suggested as a complementary procedure.

Karnapoorana is a significant element in the maintenance of ear health and proves beneficial for preventing ear disorders.

(d) Rasayana

The fundamental concept of nourishing the seven fundamental tissues (*Sapta dhatus*) is referred to as *Rasayana* therapy. This therapeutic approach is designed to attain a range of favourable outcomes, including longevity (*Deerghayu*), enhanced memory (*smriti*), improved intellect (*medha*), overall well - being (*arogya*), a youthful state (*yuvavastha*), a melodious voice (*swara*), optimal physical strength (*parama deha bala*), heightened senses (*indriya vaksiddhi*), and a radiant complexion (*kanti*) [23].

In the *Sharangdhara Samhita*, *Rasayana* is described as a practice aimed at countering the effects of aging (*Jaravastha*) and preventing the occurrence of diseases (*Vyadhi*) [24]. *Haranchandra*, when discussing the general treatment (*samanya chikitsa*) of ear disorders, used the term "*Rasashana*" instead of "*Rasayana*." In this context, he recommends the consumption of *Mamsa rasa* (meat essence) with food as a form of *Rasashana*. Furthermore,

numerous authors have recognized the practice of *Ghrta pana* (consumption of *Ghee*) as a form of *Rasayana* and have indicated its utility for all types of *Karna rogas* (ear disorders). This underscores the importance of *Rasayana* therapy in the management of ear ailments and the promotion of overall health according to Ayurvedic principles.

(e) Avyayama

The term "*Avyayama*" underscores the significance of refraining from excessive physical exertion or strenuous activities in the context of ear diseases. Engaging in strenuous tasks can potentially induce the Valsalva Manoeuvre, which involves forceful exhalation against a closed airway, leading to changes in air pressure. This pressure shift, particularly at the tympanic end of the eustachian tube, can result in the rupture of the tympanic membrane. This perforation creates a pathway through which microorganisms can easily enter the middle ear, potentially causing *Karnasrava* (ear discharge). If the sinuses, adenoids, and pharynx are already infected during the Valsalva Manoeuvre, the upward movement of infection through the opened eustachian tube can lead to middle ear infection (otitis media). This sequence of events may ultimately contribute to the development of *Karnasrava*. The connection between the Valsalva Manoeuvre and ear health underscores the importance of avoiding excessive strain and pressure changes in the context of ear conditions, especially when there is a risk of pre-existing infections spreading to the middle ear.

(f) Ashirah Snana

The term "*Ashirah snana*" refers to taking a bath while excluding the head. In the context of ear diseases, it is advisable to abstain from head baths. Head baths can potentially lead to adverse consequences, such as the swelling of impacted earwax, resulting in symptoms associated with pressure, such as ear pain, tinnitus, and hearing impairment. There is also a risk of introducing contaminated water into the ear, which could lead to infections or even the perforation of the tympanic membrane. This perforation can further contribute to the development of middle ear infections (otitis media).

Furthermore, the use of chlorinated water during head baths can cause irritation and itching in the ears. Therefore, to preserve ear health and prevent complications, it is recommended to avoid head baths in cases of ear diseases.

(g) Brahmacharya

The term "*Brahmacharya*" denotes the practice of moderation and restraint when it comes to engaging in sexual intercourse. In Ayurveda, it is believed that excessive sexual activity can lead to the abnormal depletion of vital bodily elements (*Dhatu*), a condition referred to as "*Pratiloma Kshya*." This depletion can ultimately result in a reduction of "*Oja*," which is responsible for maintaining the body's immunity and vitality. A weakened immunity due to *Oja* depletion can exacerbate various health issues, including ear disorders (*Karna Rogas*).

Vagbhata, a prominent Ayurvedic physician, emphasizes that individuals in the *Grihastha Ashrama* (householder

stage) should engage in controlled and mindful sexual activity, adhering to specific guidelines to prevent the depletion of vital elements and the subsequent weakening of immunity [25]. By practicing moderation and following prescribed rules, individuals can maintain their overall health and help prevent the exacerbation of conditions like ear disorders.

(h) Akathanam

The term "*Akathanam*" refers to the practice of refraining from excessive or unnecessary talking. Excessive talking can lead to increased movement of the jaw at the temporomandibular joint. This heightened jaw movement has the potential to trigger ear discharge.

Ear discharge can have two sources: intra - auricular (inside the ear) and extra - auricular (outside the ear). In the context of extra - auricular causes, pus originating from structures like the parotid or mastoid glands can travel through the sinus or fissures of Santorini and eventually reach the ear canal. The continuous movement of the jaw can facilitate the drainage of this pus from the ear. As the jaw moves, the process of pus drainage becomes more efficient, leading to eventual external pus drainage.

Therefore, by practicing *Akathanam* and limiting excessive talking, individuals can help reduce the excessive movement of the jaw, lowering the risk of triggering or exacerbating ear discharge.

3.4.2 Vishishta chikitsa of Karnasrava

In ancient India, the treatment of *Karnasrava* (ear discharge) involved various therapeutic procedures aimed at addressing the condition, including *Shirovirechana*, *Karnadhoopana*, *Karnapoorana*, *Karnapramarjana*, *Karnaprakshalana*, *Avachurnana*, and *Abhyantariya yogas* (for internal use) [26].

(a) Shirovirechana

Shirovirechana is a therapeutic procedure intended to eliminate accumulated and vitiated *doshas* (imbalances) from the head region. For *Shirovirechana*, powdered herbal formulations such as *Apamarga* seeds and *Katphala churna* are recommended. These herbs are chosen for their properties that help rectify *doshic* imbalances in the head region. This procedure is an integral part of Ayurvedic therapeutic practices and contributes to the overall well-being of the individual.

(b) Karnapramarjana

"*Pramarjana*" is the term used to describe the act of cleaning or mopping. This procedure entails the use of materials such as cotton swabs or other absorbent substances to meticulously mop and cleanse the ear secretions (*Karnasrava*). This cleaning process holds significant importance as it serves as a crucial preliminary step before administering any therapeutic medications or treatments. It ensures that the ear canal is thoroughly cleaned and prepared to receive the full benefits of subsequent interventions [27].

(c) Karnadhawana/Prakshalana

"*Karnadhawana*" or "*Karnaprakshalana*" is an Ayurvedic practice that involves the cleansing and washing of the ears.

This procedure entails the irrigation or rinsing of the ear canal using specific herbal decoctions or infusions. Its primary objective is to eliminate earwax, debris, and impurities from the ear, thereby promoting ear hygiene and potentially addressing certain ear-related issues. Various herbal formulations, such as *Triphala kwatha*, *Panchavalkal kwatha*, *Nimbadi kwatha*, *Lodhradi Kwatha*, *Rajvrikshadi gana*, *Lakshadi gana* and *Sursadi gana*, are employed for *Karnaprakshalana*. These herbal preparations are believed to possess therapeutic properties that contribute to ear cleansing, discomfort relief, and the maintenance of ear health [26] [27].

(d) Karnadhoopana

To cleanse both internal and external ear wounds and eliminate foul odors, specific medicinal substances are ignited, and their vapours are applied to the wound. This procedure is known as *Karnadhoopana*. Drugs like *Guggulu* (*Commiphora mukul*), *Agaru* (*Aquilaria agallocha*), and *Sarja* (*Shorea robusta*) are commonly used, and they generally act as antiseptics [26].

(e) Karnapoorana

Karnapoorana is also recommended as a special treatment of *Karnasrava* [26]. The term "*poorana*" literally means "to pour." *Karnapoorana* involves the application of medicated oils or herbal extracts into the ear canal. This procedure entails the gentle instillation of warm medicated oil or herbal extracts into the ear canal, typically with the individual lying on their side. The oil is then retained in the ear for a specified period before excess oil is drained out. *Karnapoorana* is believed to offer several benefits for various ear conditions, including ear discharge, earaches, itching, tinnitus, and hearing impairment.

The medicated oils used in *Karnapoorana* often comprise a blend of herbs and oils, each possessing potential therapeutic properties such as soothing (*shanshamana*), cleansing (*lekhana*), and relieving discharges (*sravahara*). Commonly utilized herbs in these formulations include *neem*, *bilva*, *garlic*, *apamarga*, and *sesame oil*. Specific formulations, as outlined by Sushruta, include mixtures like *Pancha - kashaya vriksha kwatha* and *Kapittha swarasa* combined with honey. The selection of these ingredients is based on their purported positive effects on ear health.

(f) Avachurnana

"*Avachurnana*" [27] refers to the practice of applying powdered medicinal substances to a specific area for therapeutic purposes. In the context of ear care and treatments, *Avachurnana* entails the application of powdered herbal drugs with an astringent taste directly into the ear canal. This method is employed to deliver the therapeutic benefits of these herbs directly to the affected area. Examples of powdered medicinal substances that can be utilized for *Avachurnana* in the ear include *Samudraphena* (powdered conch shell), *Manahshila* (realgar), *Lodhra* (*Symplocos racemosa*), powdered *Laksha* (resin obtained from insect secretions), *Rasanjana* (extract of *Berberis* species), and *Sarja* (resin from the *Shorea robusta* tree). These herbal powders are believed to possess astringent, antimicrobial, and anti-inflammatory properties that

contribute to ear health and aid in managing various ear conditions.

(g) Karnapichu

Acharya Vagbhata has recommended the use of *karnapichu* two times per day after cleansing of the ear in case of pus discharge from the ear [27]. A thick swab or cotton pad is commonly known as a "*pichu*." The practice of "*pichu dharana*" involves saturating a piece of fabric, gauze, or linen with medicated *Ghee* or oil, which is then applied to specific areas of the body as part of a therapeutic treatment. In the context of "*Karnapichu*," a tampon soaked in medicated oil is gently inserted into the external ear. While the precise quantity for *Karnapichu* is not explicitly mentioned, it should be enough to dampen the swab and fill the external auditory canal without causing any overflow. The duration of *Karnapichu dharana* typically varies from 30 minutes to 1 hour, depending on the severity of the condition and the prescribed number of days.

During the *Karnapichu* procedure, the patient should sit comfortably in a chair, and the external ear should be thoroughly cleaned. The medicated oil should be gently heated using a water bath until it reaches a comfortably warm temperature. The patient's head should be slightly tilted in the opposite direction of the affected ear, and by gently pulling the pinna backward and upward, the external auditory canal should be straightened. The medicated oil-soaked swab is then carefully inserted into the external auditory canal and kept in position for the specified time. After the recommended duration has elapsed, the swab is removed from the external auditory canal, and the ear should be cleaned using dry cotton swabs. Following the procedure, a piece of cotton is placed in the ear. If both ears are affected, the same procedure should be repeated on the opposite ear as well.

(h) Abhyantara Yogas (Formulations for internal use)

For internal use, specific formulations and preparations are often employed, as described in classical Ayurvedic texts. These formulations may include *Indu vati*, *Sarivadi vati*, *Karna rogahara rasa*, *Rasanadi guggulu*, *Triphala guggulu*, *Kaishor guggulu*, *Patoladi ghrita* and *Mayura ghrita*. These traditional remedies are utilized in accordance with the principles outlined in classical Ayurvedic literature to address various ear health concerns and promote overall well-being.

(i) Other Measures

As per the recommendations of Acharya Vagbhata, certain internal procedures are advised, which encompass *dhoompana* (fumigation), *nasya* (nasal therapy), *gandusha* (oil pulling), *vamana* (therapeutic vomiting), *nadi swedana* (localized steam therapy), and *dushta vranahara chikitsa* (treatment of chronic wounds). These procedures should be carried out when the disease is in *pakva Avastha* and when there is purulent discharge (*puya - pravahi srava*). In cases of *upadigdha srota* (ear filled with pus), a specific protocol is recommended. This involves cleansing the ear twice daily using a cotton bud (*pichu*), followed by exposure to *guggulu* fumes and the application of honey as part of the treatment regimen. These practices are in line with the principles of

Ayurveda for managing ear - related issues and promoting overall health.

According to Charaka, when dealing with conditions affecting the *Mukha* (face), *Karna* (ears), and *Akshi* (eyes), the treatment for *Peenasa* should be tailored based on factors such as one's *dosha* (constitution), *kala* (time), and *bala - abala* (strength and weakness). Acharya Charaka recommends *Vatanashaka chikitsa*, a treatment aimed at pacifying *Vata dosha*, for *Karnashoola* (ear pain), similar to its application in *Pratishyaya* (common cold). This treatment approach involves the administration of *Vatanashaka taila* (oil) and the performance of *Nasya* (nasal therapy) using *Vatanashaka* drugs in either *churna* (powder) or oil form. These Ayurvedic practices are designed to address ear pain and other related issues while considering the individual's constitution and other relevant factors.

In cases of *Karnapaka* (pus discharge from the ear), a treatment approach akin to that used for wound healing (*Vrana - ropaka*) is applied. The patient is advised to follow a *pathya* (wholesome) diet, and specialized wound - healing oil is administered within the ear [27].

3.5 Pathya - apanya in Karnasrava

The *Pathya* of *Karna rogas* are mentioned by Acharya Sushruta, Vagbhata, and Yogratnakara. It is more elaborately described by Yogratnakara. According to Yogaratnakara diets like *Godhuma* (*Triticum aestivum*), *Shali* (*Triticum aestivum*) Rice, *Mudaga* (*Phaseolus radiatus*), *Yava* (*Hordeum vulgare*), *Purana Ghrita*, *Patola* (*Trichosanthes dioica.*), *Shigru* (*Moringa oleifera*), *Vartaka* (*Solanum melongena*), *Sunnishnaka* (*Marsilea quadrifolia*), etc, are beneficial in the *Karna rogas*. Procedures like *Svedana*, *Virechana*, *Vamana*, *Nasya*, *Dhumapana*, *Siravedha*, *Brahmacharya*, *Abhashnam*, etc. are recommended in *Karna rogas*. Even he has mentioned the non - vegetarian diet like *Lava* (*Butorides sundevalli*), *Mayura* (*Pavo cristatus*), *Hirana* (*Cervidae*), *Kukkuta* (*Gallus gallus domesticus*), etc. Above all, all the sorts of *Rasayanas* are mentioned as *Pathya* for the *Karna rogas* [28].

A person experiencing *Karnasrava* (ear discharge) should take precautions to manage their condition effectively. They should avoid cold, humid weather, and exposure to air and should not introduce sticks, metallic objects, etc. to the ear. They should avoid head baths, brushing their teeth with a hard brush, diving into the water, excessive talking, exercise, and excessive scratching of the ear. They should also not consume heavy food in addition to the *Kapha vardhaka dravyas* [29].

4. Discussion

Otorrhoea correlates with a clinical condition described in Ayurveda as *Karnasrava* based on similar etiological factors, manifestation, and management. *Karnasrava* is described as an independent disease or as a symptom of ear diseases in all the classical Ayurveda texts. *Karnasrava* may occur due to *Nija Nidana* (internal factors) or *Aagantuja Nidana* (external factors). *Nija Nidana* is *Pratishyaaya*

(cold) while *Aagantuja Nidaana* is *Siroabhighata* (head trauma), *Avashyaya* (humid environment), *Jalanimjjana* (diving in water), and *Mithya - yoga of Shastra* (improper use of instruments). Due to the etiological factors which are of *Vata - Kapha* provocative in nature, gradual vitiation of *Doshas* occurs. After vitiation, they accumulate (*Sithaana samshraya*) in the middle part of the ear. On the other hand, *Aagantuja Nidana* likes water entry, scratching, head injury and itching leads to *Achaya Purvaka dosha prakopa*. These *Doshas* cause *Twaka* and *Mamsa dhatu dushti* which leads to the formation of *Vidradhi* i. e., accumulation of pus behind the tympanic membrane in the middle ear. When inflammation occurs in *Vidradhi* it gets suppurated and causes serous to purulent discharge to come out from the ear, according to the involvement of *doshas*. Now *Vidradhi* gets converted into *Vrana* (tympanic membrane perforation). The vitiated *Vata* produces symptoms like pain, tinnitus, and hearing impairment, and vitiated *Kapha* is responsible for clinical features like itching, discharge, heaviness, and blockage.

The conventional medical system also acknowledges that the primary contributing factors to otorrhoea include hot and humid weather, frequent swimming and diving, and the use of cotton swabs. These factors collectively lead to the removal of cerumen from the ear canal, causing certain water - soluble substances within it to dissolve. Consequently, this alters the typically acidic pH of the external auditory meatus, turning it more alkaline, which in turn facilitates the growth of bacteria and fungi.

Karnasrava (ear discharge) can be mucoid, mucopurulent, or purulent in nature suggestive of vitiation of *kapha* and *pitta dosha*. In chronic diseases, *vata dosha* is also deranged. These three vitiated *doshas* further vitiate the *twaka*, *mamsa*, and *rakta dhatu* resulting in tympanic membrane perforation, edematous, and erythematous middle ear mucosa, and persistent otorrhoea.

Ayurveda treats the *Karnasrava* successfully. The therapeutic options described in the treatment of *Karnasrava* in Ayurveda classics are in form of various local procedures: *Shirovirechana* (errhines), *Karnadhoopana* (ear fumigation), *Karnapoorana* (filling up the ear cavity with medication), *Karnapramarjana* (ear cleansing), *Karnadhawana* or *Karnaprasshalana* (ear washing), *Karnapichu* (use of medication dipped cotton wicks in ear cavity). Acharya Sushruta says that the selection of these procedures should be done by the physician according to the status of the individual and the severity of the disease. Acharya Charaka has mentioned that *Karnasrava* should be treated like *Vrana* when *paaka* or *srava* is present as a symptom. Further Acharya Vagbhata also recommended that the treatment of *Karnasrava* should be done on the line of treatment of *dusta vrana* and *nadi vrana* [27]. Conventional medicine also links a permanent perforation of the tympanic membrane to an epithelium - lined fistulous track [30].

Prakshalana word is used for washing some body parts to clean them like *Hasta prakashalana* for hand washing. *Karnaprasshalana* is a technique of ear washing with various liquid drugs like decoction, fresh juices, oil, etc. Sushruta has mentioned the *Sursadi gana* and *Lakshadi gana*

drugs for purification and healing of complicated wounds. *Karnaprakshalana* is similar to Aural toileting used for the management of otorrhoea in conventional medicine. Aural toileting is a term describing a number of processes for manually cleaning the ear. Techniques used may include dry mopping (*Pramarjana*) (with cotton wool or tissue paper), suction clearance (typically under a microscope), or irrigation (*Dhawana*) (using manual or automated syringing) [31].

Karnapichu (use of medication - dipped cotton wicks in the ear cavity) is a modified form of *Karnapoorana* (filling up the ear cavity with medication), which provides a long duration of skin contact time with controlled release of the drugs. *Jatyadi taila* (medicated oil - based formulation) is recommended in ayurvedic text for the treatment of non-healing wounds. It is seen in clinical practice that *Jatyadi taila Karnapichu* is effective in healing tympanic membrane perforation.

The pathogenesis of otorrhoea and its associated complications is intricate. Recent research indicates that otorrhoea is a multifactorial condition stemming from a complex interplay of environmental, bacterial, host, and genetic risk factors. Ayurvedic formulations comprise various constituents and exert their effects on multiple targets concurrently. Consequently, they are apt to be effective in treating disorders characterized by multifaceted pathogenesis and numerous therapeutic targets. Integrated treatment for otorrhoea, which combines approaches from both modern medicine and Ayurveda, may offer several potential benefits. Integration allows for a holistic approach that considers not only the symptoms but also the underlying factors contributing to otorrhoea. Ayurveda, in particular, often focuses on addressing imbalances in the body and promoting overall well-being.

5. Conclusion

Otorrhoea's multifaceted etiology and diverse clinical manifestations find resonance in Ayurveda's concept of *Karnasrava*, and the therapeutic approaches from this ancient tradition can provide valuable insights and options for contemporary medical practice. Combining the strengths of both traditional and modern medicine may lead to improved outcomes for individuals suffering from this condition and also may potentially reduce the financial burden of treatment.

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