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Case Report

Ayurvedic Intervention in Pediatric Sensorineural Hearing Loss (Badhirya): A Case Report

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ABSTRACT:

Background: Sensorineural hearing loss (SNHL) is a type of hearing impairment typically associated with aging, where the pathology lies in the inner ear or the vestibulocochlear nerve. It might be congenital or acquired. Pediatric SNHL is comparatively rare, and even more so when linked to allergic etiologies. Hearing loss is associated with *Badhriya* (~deafness) in Ayurveda and one among the *Karnaroga*. **Clinical findings:** This case describes 15year old girl presented with symptoms such as partial hearing loss, tinnitus and ear pain over a period of 5 months. The underlying etiology was associated with Allergic Rhinitis, a rare but clinically significant contributor to SNHL in children. She was diagnosed with SNHL in March, 2025. **Interventions:** Ayurvedic treatment commenced with procedures viz *Nasya* (~nasal therapy), *Karnapoorana* (~auricular oil therapy), *Matrabasti* (~oil enema) are given for 23 days and Ayurvedic medicaments viz *Pathyadi Kvatha*, *Triphala Guggulu* and *Sudarshan Ghanvati* for 23 days and follow up medicaments for 28 days. **Outcome:** Pure tone Audiometry (PTA) showed significant improvement in hearing threshold. The right ear improved from a mean of 33 dB (mild hearing loss) to 17.5 (Normal sensitivity) dB indicating approximately 46.9% improvement. The left ear improved from a mean of 80 dB (severe hearing loss) to 22.5 dB (mild hearing loss), showing approximately 71.8 % improvement. Symptomatic relief was evident, with tinnitus reduced from 6 to 2 and ear pain score reduced from 7 to 3 on the Visual Analogue Scale (VAS). **Conclusion:** This case highlights rare association of pediatric SNHL with allergic rhinitis and demonstrates that individualized Ayurvedic management, including therapeutic procedures and medications leads to clinical and audiometric improvement. Improvements were supported by clinical findings and PTA reports with sustained benefits and no adverse effects observed during treatment and follow up.

KEYWORDS: *Badhirya,* Case report**,** *Karnapoorana, Matrabasti*, *Nasya,* Sensorineural Hearing Loss

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1. INTRODUCTION

SNHL occurs when there is damage at inner ear (cochlea) or to the nerve pathways from the inner ear to the brain. This type of hearing loss can be caused by aging, genetics, exposure to loud noises, infections, head trauma or certain medications. The etiology of SNHL is multifactorial which makes the diagnosis challenging. Although laboratorial and radiographical investigations are helpful but PTA is mandatory investigation for it. According to WHO, 63 million individuals in India are affected by significant auditory impairment, corresponding to an estimated prevalence of 6.3% within India. Treatment options involve pharmacological, surgical, and supportive management. Drug treatments are limited and their effectiveness is not well established. [1] Surgical options like cochlear implants usually recommended only for severe and disabling cases due to their cost and associated risks. Management mainly focuses on supporting the remaining hearing, including techniques like lip reading, improving communication skills, and using hearing aids. This case report highlights unique instance of chronic SNHL showing significant auditory improvement after failure to respond adequately to conventional therapy. The sustained recovery, evidenced by improved PTA findings and absence of relapse during follow up, underscores the potential role of Ayurvedic management in such conditions. This condition can be compared with *Badhirya* in Ayurveda. According to *Sushruta*, when *Vata* gets lodge into *Shabdavaha Sira* (voice conducting channels) and obstructed by the vitiated *Kapha, Badhirya occurs* where affected individual experiences partial or complete hearing loss, depending on the severity of *Doshic* vitiation. [2] [3]

2. CASE REPORT

Patient information: A 15 years old girl presented to *Kaumarbhritya* OPD on April 2025 suffering from partial hearing loss, tinnitus and earache in the past 5 months. The patient had no psychosocial stress, behavioral disturbances, or emotional problems. School performance and social relationships were normal. Patient had past history of Allergic Rhinitis and Adenoid Hypertrophy and was taking medication of Tab. Vixit in OD, Tab. Levocet-M in OD, Ezicus nasal spray and Karvo plus inhaler but only symptomatic relief was observed in symptoms, but no significant improvement was noted in hearing loss, tinnitus and earache. There was no any surgical and family history. As there was no any improvement with allopathic treatment, she was admitted in hospital on 21st March 2025 for Ayurvedic management.

Clinical findings: On admission, all vital signs where within normal limits. Systemic examination did not find any abnormal findings. In *Ashtavidha Pariksha* (eightfold clinical examination) *Nadi* (pulse) was *Kaphapittaja*, in *Mutra* (urine) normal frequency of urine, *Mala Pravrutti* (stool) was one time per day, *Jivha* (tongue) was *Sama (*white coating), In *Shabda Pariksha* (speech) no abnormal sound present, *Sparsha Pariksha* (touch) reveals afebrile, *Drika* (eyes) was normal and *Akruti* (build) suggests normal built.

On ear examination, otoscopy revealed both sides external auditory canal was clear, and tympanic membranes were intact bilaterally, Rinne's test was negative (bone conduction greater than air conduction), indicating hearing impairment. Weber's test was lateralized to the right ear. PTA (02/02/2025) showed mild mixed hearing loss in the right ear and severe to profound hearing loss in the left ear.

Timeline:

Table 1: Timeline: The clinical course and interventions are summarized in the timeline

Time	Disease condition	Treatment
21/01/2025 To 01/02/2025	Started complaining of Partial hearing loss, tinnitus and pain in ear for 5 months.	Allopathic medication Tab. Vixit (OD), Tab. Levocet-M (OD), Ezicus nasal spray and Karvo plus inhaler

02/02/2025	Went to ENT surgeon who performed patient's PTA and diagnosed with SNHL	Suggest hearing aids but patient ignored.
21/03/2025	The patient admitted to hospital.	
11/04/2025	The patient experiences Partial hearing loss, tinnitus and pain in both ear since 5 months.	In Ayurvedic treatment *Karnapoorana* with *Narayana Taila, Nasya* with *Shadbindu Taila* 8-8 drops in each nostril*, Matrabasti* with *Atibala Taila* 15 ml through anal route and medicaments like *Pathyadi Kvatha* 15 ml 2 times*, Triphala Guggulu* (300 mg)2tab 2 time and *Sudarshana Ghanavati* (300 mg) 1 tab 1 time both given with water for 15 days.
12/04/2025 to 16/05/2025	Significant improvement noted: better hearing, reducing ringing sensation and pain. PTA: Right Ear: Normal Sensitivity Left Ear: Moderate mixed hearing loss	Patient discharged and advised to take oral medication at home and come for follow up every 28 days.
17/05/2025 to 16/08/2025	Right Ear: Normal Sensitivity Left Ear: Mild hearing loss Pain and tinnitus reduced	Advise to continue oral medicaments
17/08/2025 to 02/02/2026	Total 3 follow up taken No aggravation in symptoms and can hear normal sound without any difficulty.	Advise to continue oral medicaments

Diagnosis

Diagnostic Testing: On 2nd Feb 2025 patient's PTA was performed where right ear shows mild mixed hearing loss (26 to 40 dB) and both ear shows severe to profound hearing loss (65 to 95 dB). During OPD Otoscopy examination showed that both EAC was clear and both TM was visible and intact which excludes other pathologies related to earache, tinnitus and deafness (Table 4). After exclude other pathologies Rinne's and Weber's test were performed, and Weber's test showed vibrations lateralized to right ear which suggests deafness. Based on clinical features, ear examinations and PTA findings, the diagnosis of SNHL was confirmed.

Diagnostic challenges: Diagnosis in this case was challenging because pediatric SNHL associated with allergic rhinitis is rare. Symptoms like pain, tinnitus and partial hearing loss can resemble common ear problems, making early diagnosis difficult. In children, hearing problems may also go unnoticed or may not be clearly explained by the patient. Careful clinical examination and PTA were important to confirm the diagnosis and identify the possible role of allergic rhinitis. (Table 2)

Table 2: Differential diagnoses were considered and excluded based on clinical findings

Condition Considered	Basis for Consideration	Reason for exclusion
Conductive hearing loss	Hearing loss with possible middle ear pathology like wax, otitis media, air bone gap in PTA	Otoscopic examination showed clear EAC and intact TM bilaterally. No air bone gap on PTA
Meniere's disease	Hearing loss with tinnitus, vertigo and aural fullness	No history of vertigo or fluctuating hearing loss. PTA findings were not characteristic of Meniere's pattern.
Noise induced hearing loss	History of prolonged exposure to loud noise	No significant history of occupational/ recreational noise exposure. PTA did not show classical 4 kHz notch.
Ototoxicity	History of use of ototoxic drugs (Aminoglycosides)	No history of such drug intake
Idiopathic SNHL	Hearing loss without identifiable cause	Considered as final diagnosis after excluding other causes

Prognosis: Prognosis is favorable due to early intervention and the absence of structural abnormalities on otoscopy. Although advanced SNHL generally hard to reverse, the patient responded well to the intensive hospital treatment. This shows a good chance that the hearing improvement will last and stay stable. Long terms follow up and regular PTA is necessary to evaluate the progress and prevent the condition from worsening (Table 4).

Intervention: After obtaining written informed assent from the patient and consent from the parents, the patient was admitted to the IPD and administered the treatments listed in Table 3. The patient had discontinued previous medications prior to admission and did not receive any modern medicines during the Ayurvedic treatment. All medications were prepared at Sundar Ayurveda Pharmacy, a GMP-certified teaching pharmacy attached to the institution.

Table 3: Represents the treatment given to the patient along with the dose, route of administration and duration.

PROCEDURE					
No	Procedure	Medicine	Administration	Dose	Dates
1)	*Karnapoorana*	*Bala Taila* (Sundar Ayurveda Pharmacy) (Batch no. TL34876)	Both ear	Quantity sufficient	21/03/25 to 12/04/25
2)	*Nasya*	*Shadbindu Taila* (Sundar Ayurveda Pharmacy) (Batch no. TL74903)	Both nostril	8-8 drops	21/03/25 to 12/04/25
3)	*Matrabasti*	*Bala Taila* (Sundar Ayurveda Pharmacy) (Batch no. TL34876)	Anal route	15 ml	21/03/25 to 12/04/25
INTERNAL MEDICINE					
No	Medicine		Administration	Dose	Dates
1)	*Pathyadi* Kvatha (Sundar Ayurveda Pharmacy) (Batch no. KV24478)		Orally	15 ml (BD) (Before food)	21/03/25
2)	*Triphala Guggulu* (Sundar Ayurveda Pharmacy) (Batch no.GU76288)			2 tabs (BD) with water	To
3)	*Sudarshana Ghanavati* (Sundar Ayurveda Pharmacy) (Batch no.HT98324)			1 tab (OD) with water	12/04/25

Follow-up and outcome

Adherence: The treatment adherence was monitored by direct supervision during the hospital stay, treatment log maintenance, caregiver feedback, and follow up interviews after discharge. Patient followed the medications properly, which was confirmed during follow up visits (Table 3).

Tolerance: Treatment tolerability was assessed during the intervention and follow up period by monitoring adverse reactions, treatment compliance and procedural acceptability. The patient tolerated medication and procedures well, with no clinically significant adverse events, intolerance, or treatment discontinuation observed during *Karnapoorana*, *Nasya* and *Matrabasti* (Table 3).

Adverse effect: No complications were noted during the treatment and follow up period. No any burning, pain, itching and erythema in ear were observed because of the *Karnapoorana*. No any rhinorrhea, burning and irritation in nose due to the *Nasya*. No any abdominal discomfort, pain or diarrhea due to the *Matra Basti*. The retention time of *Matra Basti* was varies from 6-10 hours.

3. RESULTS:

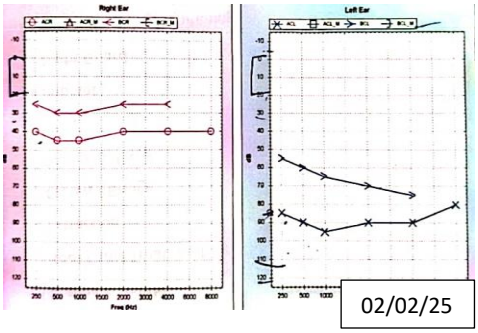

Figure 1: Audiometry before treatment (02/02/25) showing severe hearing loss in left ear and mild to moderate hearing loss in right

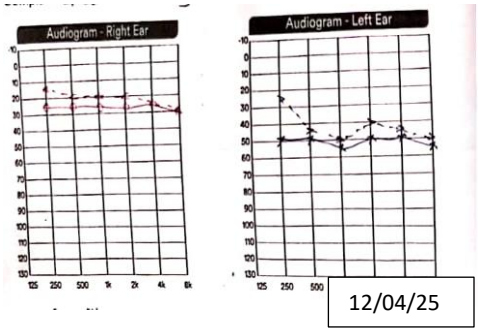

Figure 2: Audiometry after discharge (12/04/25) showing normal sensitivity in right ear and moderate to mix hearing loss

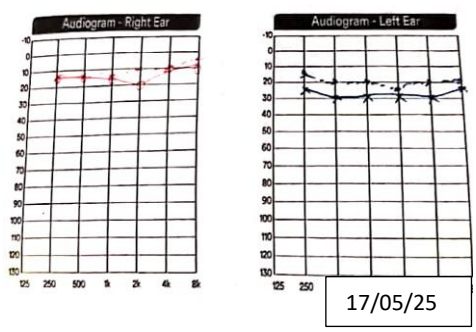

Figure 3: Audiometry during follow up (17/05/25) showing normal sensitivity in right ear and mild hearing loss in left ear

Table 4: Audiometric and symptomatic improvements were documented during admission, discharge, and follow-ups

Pure Tone Audiometry (PTA)						
	On Admission (02/02/2025)		On Discharge (12/04/2025)		1st Follow up (17/05/2025)	
Right Ear	Mild mixed hearing loss (26 to 40 dB)		Normal Sensitivity (15 to 25 dB)		Normal Sensitivity (15 to 20 dB)	
left Ear	Severe to profound hearing loss (65 to 95 dB)		Moderate mixed hearing loss (25 to 55 dB)		Mild hearing loss (15 to 30 dB)	
Symptomatic assessment						
VAS score	On Admission (21/03/2025)	On Discharge (12/04/2025)	Follow up (17/05/2025)	Follow up (17/08/2025)	Follow up (17/11/2025)	Follow up (02/02/2026)
Pain in ear (both side)	7	4	3	3	3	3
Tinnitus	6	3	3	2	2	2

4. DISCUSSION

Patient shows marked improvement over the course of treatment and follow-ups (Table 4). On admission, PTA revealed mild mixed hearing loss in the right ear (26-40dB) and severe to profound hearing loss in the left ear (65-95dB). On discharge, the right ear improved to normal hearing sensitivity (15-25dB), while the left ear showed improvement to moderate mixed hearing loss (25-55dB). On 1st follow up the right ear maintained normal sensitivity (15-20 dB), and the left ear further improved to mild hearing loss (15-30 dB). Symptomatic assessment showed significant relief, with the VAS score for Tinnitus reducing from 7 at admission to 3 during follow ups, and ear pain decreasing from 6 to 2 (Table 4). These improvements were sustained across follow ups, indication stable recovery without relapse. Overall, the intervention resulted in significant audiological and symptomatic improvement (Table 4), enhancing the patient's quality of life.

SNHL is a common ENT condition and can be difficult for doctors to manage. Modern medicine offers treatments such as medications and hearing aids. Drugs like antivirals and steroids may help, but long-term use of steroids can cause side effects, especially in children. Hearing aids are useful but can be expensive, may cause earwax build-up, and can be uncomfortable, particularly for pediatric patients. In this case, both clinical symptoms and PTA showed improvement (Table 4). This case included Panchakarma procedures such as *Nasya*, *Karnapoorana* and *Matrabasti* along with internal medicines (Table 3). This combined approach may have helped to provide sustained improvement and prevent

reoccurrence. The findings of the present case are similar to those reported in earlier Ayurvedic case studies on SNHL. Sultana and Rathi (2022) reported improvement in hearing and related symptoms after Ayurvedic treatment including *Karnapoorana* and internal medications. [4] Similarly, Lakhwinder Singh et al. (2024) observed better hearing ability and improvement in Audiometric findings in a patient with SNHL treated with *Nasya*, *Karnapoorana*, and oral Ayurvedic medicines. [5]

In Ayurveda, SNHL can be correlated with *Badhirya*. If vitiation of *Vayu* occurs in *Shabdavaha Srotasa* (channels in Auditory Pathway), it will lead to voice production in ear known as *Karnanada* (tinnitus). [6] If this vitiated *Vayu* associated with *Kapha* it will cause *Karnabadhirya*. [7] *Shushruta* suggests, *Bala Taila* can be used in therapies like *Shirobasti* (oil pulling in Head), *Nasya*, *Parisheka* (affusion therapy), and as internal medicine for ear disorder. [8] It is especially effective in the treatment of *Vatavyadhi*. [9] When it is administered as *Matra Basti*, it helps in balancing aggravated *Vata* throughout the body and do *Rasayana* (rejuvenation therapy). When *Bala Taila* is used as *Karnapoorana*, it directly helps in reduce *Vata* in *Shabdavaha Srotasa*. *Charaka* also mentioned that regular *Karnapoorana* can prevent ear disease like *Badhirya*, *Manya* (nape of neck) and *Hanugraha* (stiffness of jaw). [10] The nose is the route of drug administration for the pathologies which is anatomically related to the supraclavicular region. The best method to eliminate the vitiated *Doshas* from *Urdhvanga* (upper part of body). [11] So *Nasya* is *Karma* of choice in *Karna Badhirya*. Even *Shadbindu Taila* is *Shodhana* (purification therapy) type of *Nasya* which eliminates the accumulated *Doshas* from *Urdhvanga*. It helps to reveal blockage of *Kapha* and provides natural flow of *Vata* in *Shabdavaha Shrotasa*. [12] *Pathyadi Kvatha* is useful in *Shiroroga* (disease of head) and *Karnashula* (earache). [13] It helps balance *Vata* and *Kapha*, which are mainly involved in *Karnabadhirya*. Medicines like *Triphala Guggulu* [14] and *Sudarshana Ghanvati* [15] act as *Rasayana* and help balance all three *Doshas*, improving overall health.

In this patient, *Sneha* was administered through *Nasya*, *Matra Basti*, and *Karnapoorana*. According to *Charaka Siddhi Sthana*, *Sneha* should not be administered through two different routes at the same time, as it may disturb *Vata* and *Agni*. Therefore, the timing of all procedures was carefully planned. *Karnapoorana* was performed in the morning at 9:00 AM, *Nasya* was administered in the evening around 5:00 PM, and *Matra Basti* was administered at night after dinner, around 8:00 PM. This planned scheduling helped prevent *Vata* and *Agni Dushti*.

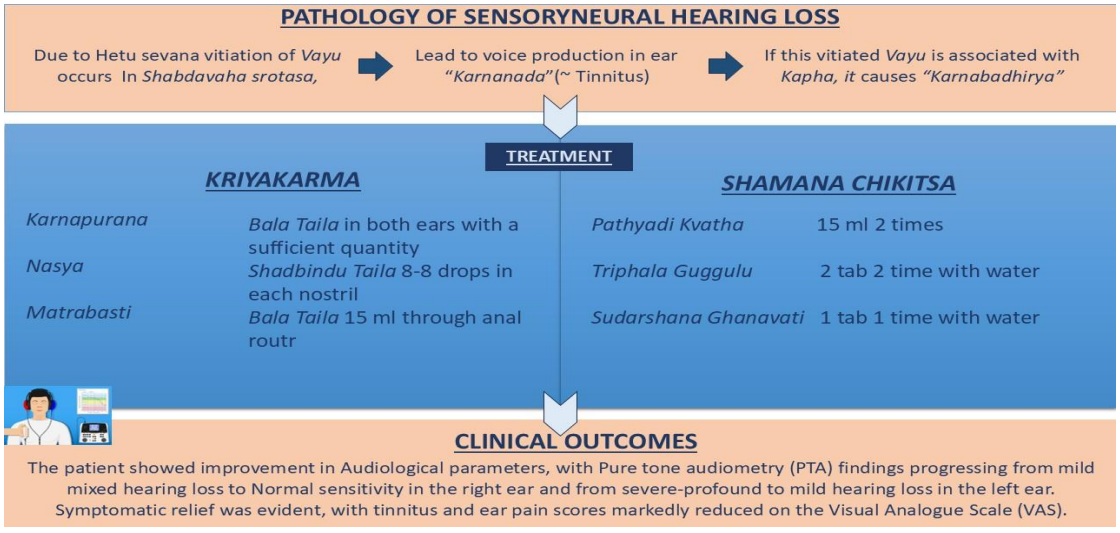

Diagram 1: Probable Mode of Action Flow Chart

Strength: In previous researches of SNHL only mild to moderate threshold shift in PTA was found but in this case study remarkable improvement in both ear about 46.97% and 71.88% in right and left ear respectively found (Table 4). Additionally, in previous research works relies on standard localized protocol like *Bilva Taila Karnapoorana* only used. But in this study use of panchakarma procedures with *Rasayana* line of management which prevent the further reoccurrence of the disease which showed in long follow up period (Table 4).

Limitations: This is a single case study with lack of control group, which restrict applicability. Additionally, long term sustainability of outcomes cannot be conclusively established.

5. CONCLUSION

This case report describes the management of a five-month history of chronic sudden SNHL associated with tinnitus and ear pain (Table 1). The patient underwent under Ayurvedic treatment protocol which includes *Shodhana* therapies (*Nasya*, *Karnapoorana*, *Matra Basti*), *Shamana* medications, *Pathyapathya* (Table 3). The patient received 23 days of IPD treatment, followed by continue oral medications at regular follow up. The total follow up period was 10 months, during which sustained clinical improvement was observed. No adverse effect or treatment related complications were reported. Key findings included progressive improvement in Audiological parameters, with PTA demonstrating recovery from mild to mix hearing loss to normal sensitivity in the right ear and severe to profound hearing loss to mild hearing loss in the left ear, along with marked reduction in tinnitus and ear pain (Table 4). No reoccurrence and aggravation of symptoms was noted during follow up (Table 1). Incidental finding was the patient's prior refusal of hearing aid despite medical advice, yet significant functional improvement was achieved through the ayurvedic management approach. This observation suggests that a multimodal Ayurvedic interventions incorporating *Shodhana*, *Shamana* and *Pathyapathya* may be beneficial in improving hearing function and associate symptoms in Chronic SNHL.

Declaration of Patient Consent – The authors confirm that they have acquired a patient consent form, in which the patient or caregiver has granted permission for the publication of the case, including accompanying images and other clinical details, in the journal. The patient or caregiver acknowledges that their name and initials will not be disclosed, and sincere attempts will be undertaken to safeguard their identity. However, complete anonymity cannot be assured.

Patient's Perspective: The patient's view "When I came to hospital, I was suffering from partial hearing loss, tinnitus and pain in my both ear, which made difficult me for hearing. After receiving treatment at hospital, I have experienced significant improvements in my hearing, along with a reduction in ringing and pain."

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Approval of final manuscript: All authors

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Declaration of Generative AI

The authors declare this manuscript was written without the use of generative artificial intelligence tools. All the content, including text generation, data analysis and references was developed and reviewed by the author without assistance from AI technologies.

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