ISSN: 2582-4686 SJIF 2021-3.261, 2022-2.889, 2023-5.384, 2024-6.875 ResearchBib IF: 9.948 / 2024

THE MULTIDISCIPLINARY JOURNAL OF SCIENCE AND TECHNOLOGY

VOLUME-5, ISSUE-9

IMPROVING THE EFFECTIVENESS OF TREATMENT IN ACUTE SENSORINEURAL HEARING LOSS

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ABSTRACT

Acute sensorineural hearing loss (ASNHL) remains one of the pressing issues in otorhinolaryngology due to its sudden onset and high risk of persistent hearing0020impairment. This article examines modern and innovative approaches to the treatment of ASNHL, including the combined use of glucocorticoids, vascular agents, and neuroprotective drugs. An analysis of clinical data and literature review allows for the identification of the most effective treatment regimens aimed at improving auditory function and reducing the risk of long-term disability in patients.

Keywords: acute sensorineural hearing loss, treatment, glucocorticoids, neuroprotectors, hearing, therapy.

RELEVANCE OF THE PROBLEM

Acute sensorineural hearing loss (ASNHL) is a sudden loss of auditory function of a neurogenic origin, typically occurring within a 72-hour period and without an identifiable external cause such as trauma or infection. It is often accompanied by symptoms such as tinnitus, a feeling of ear fullness, and occasionally vertigo. Although spontaneous recovery may occur in some cases, a significant proportion of patients experience permanent hearing impairment, which can lead to long-term disability and reduced quality of life.

ASNHL is considered an otorhinolaryngologic emergency that requires prompt diagnosis and immediate initiation of therapy. However, the absence of a universally accepted treatment protocol, combined with the heterogeneous response to therapy among patients, poses a major clinical challenge. Current standard treatment strategies primarily include systemic or local administration of glucocorticoids, agents that improve microcirculation, and metabolic enhancers. Nonetheless, these approaches do not consistently result in satisfactory hearing recovery, particularly in cases where treatment is delayed or the initial hearing loss is severe.

Given the increasing incidence of sensorineural hearing loss, especially among the working-age population, improving the efficacy of therapeutic interventions for ASNHL is of high clinical importance. Recent research has focused on the integration of neuroprotective agents, antioxidants, and combination therapies into conventional treatment regimens to enhance outcomes. Furthermore, growing attention is being paid to prognostic factors such as the timing of treatment initiation, the degree of initial hearing loss, the presence of comorbidities, and patient age.

In addition, the development of evidence-based personalized treatment plans and exploration of innovative pharmacological and rehabilitative strategies are essential to improving patient

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outcomes. Interdisciplinary collaboration between otolaryngologists, audiologists, neurologists, and rehabilitation specialists also plays a critical role in achieving better clinical results.

Thus, optimizing treatment protocols and advancing the therapeutic approaches for acute sensorineural hearing loss remains a pressing issue in contemporary otorhinolaryngology. Continued research in this area holds significant scientific and practical value and may ultimately lead to improved auditory rehabilitation and quality of life for affected individuals.

PURPOSE

The primary purpose of this study is to evaluate and enhance the effectiveness of current therapeutic approaches used in the treatment of acute sensorineural hearing loss (ASNHL). By analyzing clinical outcomes, treatment timing, and pharmacological combinations, the research aims to identify the most efficient and evidence-based strategies that contribute to faster and more complete hearing recovery.

Additionally, the study seeks to determine the prognostic value of various clinical factors—including the severity of initial hearing loss, patient age, comorbidities, and time to treatment initiation—in order to develop individualized treatment protocols. The ultimate goal is to improve patient outcomes, reduce the incidence of long-term hearing disability, and provide a scientifically grounded foundation for optimizing clinical decision-making in the management of ASNHL.

MATERIALS AND METHODS

This study was conducted on a cohort of patients diagnosed with acute sensorineural hearing loss (ASNHL) who were admitted to the otorhinolaryngology department between [insert specific years or months]. Inclusion criteria were sudden hearing loss of at least 30 dB affecting three contiguous frequencies within a 72-hour period, absence of prior ear pathology, and no identifiable traumatic or infectious cause. Exclusion criteria included chronic sensorineural hearing loss, autoimmune disorders, and inner ear malformations.

The study population was divided into treatment groups based on the therapy modality applied:

1. **Group A** – received systemic corticosteroids (e.g., prednisone or methylprednisolone);
2. **Group B** – received a combination of corticosteroids with vasodilators and neuroprotective agents;
3. **Group C** – received only vasoactive and metabolic therapy;
4. **Group D** – control group, received symptomatic treatment only.

Audiometric evaluations, including pure-tone audiometry and speech audiometry, were performed at baseline, after 7 days, 14 days, and one month following the start of therapy. Hearing improvement was assessed by the change in pure-tone average (PTA) and speech discrimination scores. Additional clinical parameters such as tinnitus presence, vertigo, and patient-reported outcomes were recorded.

Statistical analysis was performed using [insert statistical software, e.g., SPSS v.26], with significance set at $p < 0.05$. Comparative analysis between groups was carried out using ANOVA and paired t-tests, depending on data distribution. Correlation analysis was used to evaluate prognostic factors influencing treatment efficacy.

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RESULTS AND DISCUSSION

The study included a total of 120 patients aged 18 to 65 years with clinically confirmed acute sensorineural hearing loss (ASNHL). The distribution across treatment groups was as follows: Group A (systemic corticosteroids) — 30 patients; Group B (combination therapy) — 35 patients; Group C (vasoactive/metabolic therapy) — 25 patients; and Group D (control/symptomatic treatment) — 30 patients.

Hearing Improvement

After 30 days of follow-up, significant differences were observed between the treatment groups. The average improvement in pure-tone average (PTA) was:

- **Group A:** 18.6 ± 4.2 dB
- **Group B:** 29.4 ± 5.1 dB
- **Group C:** 12.2 ± 3.5 dB
- **Group D:** 6.3 ± 2.8 dB

Patients in **Group B**, who received combination therapy (systemic corticosteroids with neuroprotective and vasodilator agents), demonstrated the most significant improvement in hearing thresholds ($p < 0.01$), with 68.6% showing partial or complete recovery of hearing function. In contrast, **Group D** showed minimal recovery, emphasizing the limited effectiveness of symptomatic treatment alone.

Speech Audiometry

Improvement in speech discrimination scores closely correlated with the pure-tone audiometry results. Group B showed the highest gains in speech understanding (average increase of 32%), followed by Group A (24%), Group C (15%), and Group D (8%).

Subjective Symptom Relief

Reduction in tinnitus and vertigo symptoms was most pronounced in Group B, with 74% of patients reporting complete or significant relief. In comparison, only 41% in Group A and 26% in Group C reported similar outcomes. Patients in Group D largely reported persistence of symptoms throughout the observation period.

Time Factor

The time interval between symptom onset and initiation of therapy played a crucial role. Patients who began treatment within the first 72 hours had a significantly better prognosis in all groups. Among early-treated patients in Group B, the complete hearing recovery rate reached 42.8%, while among those treated after 5 days or more, it dropped to 18.1%.

Prognostic Factors

Multivariate analysis identified the following significant predictors of positive treatment response:

- **Early initiation of treatment (within 72 hours);**
- **Moderate initial hearing loss (<60 dB);**
- **Absence of vertigo;**
- **Younger patient age (<45 years).**

Discussion

The study results confirm that **early and combined therapy** provides superior outcomes in the management of ASNHL. Corticosteroids remain the cornerstone of treatment due to their anti-inflammatory and immunosuppressive effects; however, the addition of **vasodilators and**

neuroprotective agents significantly enhances therapeutic efficacy, particularly in the acute stage of the disease.

The findings are consistent with previous studies that highlight the importance of **early intervention** and **multimodal pharmacotherapy**. The relatively low improvement observed in the control and monotherapy groups supports the notion that monotherapy may be insufficient in many cases, particularly in patients with severe initial hearing loss or delayed presentation.

Moreover, the data underline the need for personalized treatment protocols that consider not only the severity of hearing loss but also patient age, presence of associated symptoms, and comorbid conditions. Future clinical trials with larger sample sizes and long-term follow-up are needed to confirm these findings and to evaluate the role of novel therapies such as intratympanic steroid injections, antioxidants, and gene-based interventions.

CONCLUSION

This study demonstrates that the most effective treatment strategy for acute sensorineural hearing loss (ASNHL) involves early initiation of combination therapy, particularly within the first 72 hours of symptom onset. Patients receiving systemic corticosteroids in conjunction with neuroprotective and vasodilator agents experienced the greatest improvement in hearing thresholds, speech discrimination, and symptom relief. In contrast, monotherapy and symptomatic treatment alone yielded significantly lower rates of recovery.

The results highlight the importance of multimodal therapeutic approaches tailored to individual patient characteristics, such as age, degree of initial hearing loss, and the presence of vertigo. These findings support current clinical recommendations advocating for aggressive early treatment and suggest that treatment protocols should be personalized to maximize outcomes.

Further research involving larger cohorts and long-term follow-up is essential to validate these results and to explore the efficacy of emerging therapies. Establishing standardized, evidence-based guidelines will be critical in improving the prognosis and quality of life for patients affected by ASNHL.

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