

Role of *Ginkgo Biloba* Extract in Sensorineural Hearing Loss: A Randomised Prospective Clinical Study

Preeti Sharma^{1,3}, Ratnesh Kumar², Vineet Sinha³

¹Assistant Professor, Department of ENT, Patna Medical College & Hospital, Patna, Bihar, India

²Assistant Professor, Department of ENT, Patna Medical College & Hospital, Patna, Bihar, India

³Associate Professor & Head, Department of ENT, Patna Medical College & Hospital, Patna, Bihar, India

Received: 08-07-2021 / Revised: 29-07-2021 / Accepted: 20-08-2021

Corresponding author: Dr. Ratnesh Kumar

Conflict of interest: Nil

Abstract

Background: Sensorineural hearing loss and tinnitus is one of the most frequently encountered problem in day-to-day practise. Despite best medical management, these patients often remain dissatisfied with improvement and search for more treatment strategies continues. Among the used medicinal plants, *Ginkgo biloba* (Folium Ginkgo) is frequently used in the treatment.

Aims and objectives: To study the efficacy of Ginkgo biloba extract in cases of sensorineural hearing loss with regard to improvement in hearing and tinnitus. **Material and Methods:** 60 patients with sensorineural hearing loss were included and randomly allocated into any of 2 groups being studied. Group- A received Ginkgo biloba extract along with conventional therapy and Group – B received conventional regimen (oral vitamin A and vitamin B complex).

Results: There were subjective improvement in hearing in 23 patients in Group A compared to 18 in Group B. 20 patients in Group A compared to 15 patients in Group B showed subjective improvement in tinnitus. 7 patients in Group A showed greater than 10db improvement in hearing compared to only 4 patients in Group B. **Conclusion:** ginkgo biloba extracts together with conventional therapy helps in better patient management and improved symptomatology.

Keywords: *Ginkgo biloba* extracts together with conventional therapy helps in better patient management and improved symptomatology.

This is an Open Access article that uses a fund-ing model which does not charge readers or their institutions for access and distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>) and the Budapest Open Access Initiative (<http://www.budapestopenaccessinitiative.org/read>), which permit unrestricted use, distribution, and reproduction in any medium, provided original work is properly credited.

Introduction

Sensorineural hearing loss and tinnitus is one of the most frequently encountered problem in day-to-day practise. Patients presenting with sensorineural hearing loss often remains unsatisfied with the improvement shown despite best possible medical scenario leading to several mental and physical impairments and can impair

the quality of life. Common causes include old age, prolonged exposure to loud noise, viral infections, various drug induced ototoxicity, idiopathic etc. Among the used medicinal plants, *Ginkgo biloba* (Folium Ginkgo) is one of the herbals that frequently used in the treatment and has been studied in various studies. *Ginkgo biloba*¹ belongs

to Ginkgoaceae family and its leaf has a range of phytochemicals, including alkanes, lipids, sterols, benzoids, carotenoids, phenylpropanoids, carbohydrates, flavonoids and terpenoids. Studies show that *Ginkgo biloba*, which is a monoamine-oxidase inhibitor (MAOI) can effectively improve patients with Sensorineural hearing loss and tinnitus caused by ischemia due to having myricetin and quercetin flavonoids and ginkgolide and bilobalide terpenoids. It improves blood flow and appropriately regulates vascular tone. Cardiovascular problems can cause problems in blood supply to labyrinthine artery and this causes hypoxia in the outer hair cells of the cochlea and lead to subjective tinnitus. Adequate blood supply to the cochlea, which can be justified by *Ginkgo biloba*, can stop this process. Antioxidant and protective effects on nerve cells in the brain, auditory cortex, and sub-cortical area can also justify the anti-tinnitus effects of *Ginkgo biloba* [2,3,4].

Material and methods:

After written informed consent, this randomised prospective clinical study was conducted at our tertiary care centre over period of 1 year and 60 patients were included in the study (30 in each group). All cases of sensorineural hearing loss, except those due to sudden sensorineural hearing loss, congenital/hereditary disorders, autoimmune diseases, neoplasms were studied. Cases of sensorineural hearing loss presenting with vertigo and with past history of otitis media were also excluded from the study. A detailed case history with special stress on hearing loss and tinnitus was recorded and the cases underwent a thorough ENT examination.

First hearing assessment with Pure tone audiometry was done as baseline for the initiation of therapy. Pure tone audiometry was repeated at monthly intervals for 3 consecutive months. Assessment of tinnitus was done before starting any modality of treatment and it was reassessed at the end of

treatment (3 months) using subjective assessment of the patient

All the cases were randomly allocated into any of two groups: Group- A: In these cases, *Ginkgo biloba* extract (Tab Ginkoba 40mg, three times daily) along with conventional therapy (Tab Neurobion forte) was given for 3 months. Group - B: In these cases, conventional regimen with oral vitamin A (Capsule Vit A 50,000 once daily), vitamin B complex (Tab Neurobion Forte 1tab twice daily: B1 - 10mg., B2- 10 mg, B3- 45mg, B6-3 mg., and B12- 15mcg) was used for three months.

Subjective and objective improvement in hearing was considered when the patient had lessening of symptom of hearing impairment (or even a feeling of "well being" in relation to the hearing) Subjective improvement in tinnitus was assessed by patients satisfaction of improving symptoms Objective improvement was based on improvement in hearing on pure tone audiograms and were divided into 3 classes:

Class- I: No subjective (symptomatic) improvement. No Objective (pure tone audiogram) improvement in pure tone thresholds - No effect of drug

Class- II: Subjective improvement only. Objective improvement < 10dB

Class - III: Subjective improvement with objective improvement > 10dB but hearing not returning to near normal

Results:

Both groups were comparable in respect to age, sex and other demographic profile. The detailed observation is shown in table -1. There was subjective improvement in hearing in 23 patients in Group A compared to 18 in Group B. 20 patients in Group A compared to 15 patients in Group B showed subjective improvement in tinnitus. 7 patients in Group A showed greater than 10db improvement in hearing compared to only 4 patients in Group B.

Table 1: Comparable in respect to age, sex and other demographic profile

		Group A (n=30)	Group B (n=30)
1.	Subjective improvement in hearing	23 (76%)	18 (60%)
2.	Objective improvement in hearing		
	Class 1	7 (23.3%)	12 (40%)
	Class 2	16 (53.3%)	14 (46.6%)
	Class 3	7 (23.3 %)	4 (13.3%)
3.	Subjective improvement in tinnitus	20 (66.6%)	15 (50%)

Discussion:

The commonest probable etiology of sensorineural hearing loss was presbycusis (36.5%) followed by idiopathic (28.8%) and ototoxicity (11.5%). Below 50 years of age the common cause of hearing loss was idiopathic and above that age it was presbycusis.

Lobel et al[5] (1951) showed improvement of 17-18% in hearing threshold by parenteral Vit A alone or in combination with Vit B complex in patients of sensorineural hearing loss of various degrees and etiologies. Chessebeouf et al[6] in 1979 reported significant audiometric hearing improvement in 12% of patients treated with *Ginkgo biloba* extract as compared to vasodilator (Nicergoline). A study by Coles et al[7] (1988) reported improvement in tinnitus with *Ginkgo biloba* extract to be 24%. However, there were lot of side effects noted by Coles et al, (1988) which were not seen in the present study. A comparative therapeutic trial of *Ginkgo biloba* extract and Nicergoline (Vasodilator) in acute cochlear deafness showed a significant improvement based on audiometry and symptom severity in both therapeutic groups but improvement was distinctly better in the *Ginkgo biloba* group as seen by Dubreil et al[8] in 1986.

Conclusion:

Ginkgo biloba along with standard conventional therapy is more efficacious in symptomatic as well as objective

improvement in hearing as well as tinnitus in patients with sensorineural hearing loss.

References:

1. Kleijnen J, Knipschild P. *Ginkgo biloba*. Lancet. 1992;340(8828):1136-9.
2. Diamond BJ, Shiflett SC, Feiwel N, Matheis RJ, Noskin O, Richards JA, et al. *Ginkgo biloba* extract: mechanisms and clinical indications. Arch Phys Med Rehabil. 2000;81(5):668-78.
3. Louajri A, Harraga S, Godot V, TOUBIN G, KANTELIP JP, MAGNIN P. The effect of ginkgo biloba extract on free radical production in hypoxic rats. Biological and Pharmaceutical Bulletin. 2001;24(6):710-2.
4. Droy-Lefaix M, Cluzel J, Menerath J, Bonhomme B, Doly M. Antioxidant effect of a *Ginkgo biloba* extract (EGb 761) on the retina. Int J Tissue React. 1994;17(3):93-100.
5. Lobel M. J. Is hearing loss due to nutritional deficiency. Archives of Otolaryngology, 1951, 53: 515 - 576.
6. Chessebeout L., Herard J., Trevin J., Edude Comparativede drux varooregutaleus dans les hypo acouseies et les syndroms vertigo neus. Med. Nord. EST 3, 1979:534 -539.
7. Coles. Trial of an extract of *Ginkgo Biloba* for tinnitus & hearing loss Clinical Otolaryngology 1988, 13: 501-502.
8. Dubreil C., Comparative therapeutic trial of *Ginkgo biloba* extract & Nicergoline in acute cochlear deafness. Presse Med. 15: 1559- 1561.