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HEARING RECOVERY USING TWO MODALITIES: PREDNISONE VERSUS PREDNISONE WITH ACYCLOVIR IN TREATMENT OF PATIENTS WITH IDIOPATHIC SUDDEN SENSORINEURAL HEARING LOSS

Shatha Abutineh Ph*[1], Dr. Khaled Al Sarayreh[2], Dr. Amin Daoud[2], Dr. Ala'a Al Salaheen[2] and Dr. Muayyad Al Shakhnbeh[2]

[1]Pharmacist, King Hussein Medical Center.
[2]Otolaryngology Department, King Hussein Medical Center.

***Corresponding Author: Shatha Abutineh Ph**
Pharmacist, King Hussein Medical Center.

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ABSTRACT

Objective: To investigate whether combining an antiviral drug to systemic steroids assists retrieval in the medical management of idiopathic sudden sensorineural hearing loss. **Patients and Methods:** The study was conducted on 42 individuals who had presented to our clinic with proved diagnosis. of idiopathic sudden sensorineural hearing loss. The involved individuals were selected randomly to one of the following two categories: **Group I:** Prednisolone (of a maximum dose of 80 mg/day for a period of four days, then lowered over 10 days) was given to 21 patients in addition to a placebo. **Group II:** Patients who given prednisone in combination with acyclovir (one gram, every eight hours for 10 days) (21 patients). The variations in the level of hearing in the afflicted ear (from start to final) was calculated as the Average Pure Tone (PTA), This was determined by taking the average of the thresholds at 0.5, 1, 2, and 4 KHz. Secondary outcome assessments were speech discrimination scores (SDS). **Results:** There were no differences that were statistically significant ($p > 0.05$) in the level of change in PTA and SDS between the initial presentation and the last assessment between the two groups. **Conclusion:** In individuals with Sudden Sensorineural Hearing Loss, Steroid treatment enhances recovery outcomes considerably.In the treatment of idiopathic sudden sensorineural hearing loss, antiviral therapy did not outperform steroid alone.

KEYWORDS: Idiopathic sudden sensorineural hearing loss, prednisone, Acyclovir.

INTRODUCTION

With a yearly incidence of between five and twenty per 100,000 patients, sudden sensorineural hearing loss (SSNHL) is considered to be a terrifying condition that is classified as one of the rarest emergency ear problems. It is usually described as hearing loss of over twenty decibels in a minimum of three audiometric frequencies that occurs within three days or lesser.

Because the patient's chances of recovery without treatment are only between 32% and 65%, this disorder can be severely debilitating for them.[1,2] For the doctor, treating a patient with SSNHL can be challenging and frustrating. The group of patients with SSNHL is diverse, and there are no established interventional strategies to follow.

Effective treatment for idiopathic SSNHL is hampered by our ignorance of its precise causes. The most generally supported theories for SSNHL involve viral or vascular etiologies, despite the fact that numerous mechanisms have been proposed.[3] Actually, it's likely that both of these processes take place.

The only available treatment for ISSNHL at this time is systemic corticosteroid therapy[4], which has been proven effective in rigorously regulated clinical trials. Rather than being immunosuppressive, It is assumed that the mechanism of action is anti-inflammatory in nature.

The recommended course of treatment is seven days, with a 49–79% success rate.[4–12] Numerous therapies for ISSNHL have been investigated and proven to be ineffectual.

These include magnesium, gingko biloba, hyperbaric oxygen, vitamins that scavenge free radicals, procaine, heparin, dextran, pentoxifylline, and procaine; they also include vasodilatory drugs like histamine, papverine, verapamil, and carbogen.[13]

This is a placebo-controlled, randomized, double-blind study which was carried out to see if adding an antiviral drug to systemic steroids helps patients with idiopathic sudden sensorineural hearing loss recover better.

MATERIAL AND METHODS

We conducted this study on 42 individuals who were treated at King Hussein Medical Center's ENT department with a diagnosis of idiopathic sudden sensorineural hearing loss.

The term "sudden" was limited to events that occurred instantly or developed over a period of no more than three days. SSNHL was defined as having at least a 30-dB sensorineural hearing loss in at least three frequencies.

On the initial visit, every patient had given a thorough medical history along with the progression of their current condition. A thorough neurotologic examination was part of the physical examination.

'All patients that had an earlier diagnosis of Meniere's syndrome in either ear, any form of prior ear surgical procedures, blunt or penetrating ear trauma, or barotrauma, or acoustic trauma just prior to SSNHL,' were not considered for inclusion in our diagnostic criteria..

Within twelve hours of the first visit, every patient under evaluation for sudden-onset hearing loss had an audiological examination; nearly all audiograms had been obtained in less than two hours.

All of these patients developed idiopathic unilateral SNHL within 72 hours. At three consecutive frequencies, they all had a 30 dB hearing loss. They all underwent audiograms performed prior to and following treatment.

The treatment protocol was implemented after being diagnosed with idiopathic SSNHL. During approximately six hours after their initial visit, the great majority of patients obtained medical treatment.

Patients were then randomly assigned to one of the following two categories

Group I: Prednisolone (dose of 80 mg/day for a period of four days, then lowered over 10 days) was given to 21 patients in addition to a placebo.

Group II: Patients who given prednisone in combination with acyclovir (one gram, three times a day for 10 days) (21 patients).

The regimen for treatment comprised a ten days course of acyclovir or placebo and a 14-day course of systemic steroids (Prednisone).

The change in hearing levels in the affected ear (from initial to final) was calculated as the Average Pure Tone (PTA), This was calculated by taking the average of the thresholds at 0.5, 1, 2, and 4 KHz. Secondary outcome assessments were speech discrimination scores (SDS).

Two weeks and six weeks following the initiation of treatment, patients were scheduled for follow-up appointments, with an audiogram scheduled for the same day as the follow-up. Subjective changes in hearing were observed at the second visit. Repeat audiograms and the patients' course of treatment were evaluated.

RESULTS

There were 26 (62%) of the 42 patients were men, and 16 (38%) were women. The ages of the participants ranged from 23 to 61 years, with a mean of 37 years. Among those diagnosed, 14 (33%) had involvement in the right ear and 28 (67%), the left ear.

In terms of recovery, gender and the affected ear's laterality did not show statistical significance ($P < 0.05$).

At follow-up, thirty-seven individuals, accounting for 76% of the total, reported an improvement in their hearing, and additional audiograms proven the better results. Following treatment, there was no discernible or documented decline in hearing in either group. The course of therapy yielded no adverse effects.

Table I illustrates the audiological results for both groups. Regarding the degree of change in PTA and SDS between presentation and the last test, there were no differences that were statistically significant ($p > 0.05$) between the two groups.

Table I: Audiological results in both groups.

	Group I	Group II
Pure-tone average		
Afflicted ear, beginning	77.3	75.5
Afflicted ear, End	34.7	33.8
Difference (Aff-B − Aff-E)	42.6	41.7*
Speech Discrimination Score (%)		
Afflicted ear, beginning	25.4	27.1
Afflicted ear, End	61.3	64.1
Difference (SDS-B − SDS-E)	35.9	37.0*

*$p > 0.05$ for acyclovir Vs placebo.

DISCUSSION

Idiopathic SSNHL research has had little impact in establishing a standard definition or protocols for treatment. The infrequent occurrence in the regular ENT emergency, lack of causative specifications, and a significant rate of spontaneous recovery all contribute to this failure. In our study, we described individuals who complained of sudden hearing loss and were found to have idiopathic SSNHL. SSNHL was described as hearing loss of over twenty decibels in a minimum of three audiometric frequencies that occurs within three days or lesser, as reported by Wilson et al.[4]

The vast majority of pharmaceuticals evaluated in controlled, randomized studies belong into the following categories: 1) steroids therapy; 2) particular antiviral treatment; and 3) specific therapies of vascular insufficiency.

The rationale behind the use of steroids is an assumed process of inflammation in the inner ear. Such inflammation may result from autolytic alterations surrounding an area of ischemia or infarction, viral infection, or even an autoimmune mechanism. Stated differently, steroid therapy is non-specific and can be helpful for a variety of etiologies.

Wilson et al.'s randomized controlled trial of SSNHL therapy is the one that is most frequently cited.[4] In this study, oral steroids or a placebo was randomized to be given to 67 SSNHL patients at two clinical sites. Comparatively speaking, 32% of the placebo group and 61% of the steroid group reported improved hearing overall. Patients with hearing thresholds of forty decibel or mid-frequency hearing losses of up to 85 dB consistently had remarkable hearing recovery, regardless of received treatment. Of the participants with flat losses of ≥90 dB, only 24% exhibited any improvement in their hearing, and none of them recovered to normal.

Recent research has indicated that intratympanic steroid administration may be able to save hearing that is unresponsive to oral steroid therapy and may be able to achieve higher inner ear drug concentrations than the oral route.[14–16] Every treatment series has shown that better hearing outcomes were linked to earlier treatment initiation.

The idea that many cases of this kind of hearing impairment have a viral etiology underpins the potential efficacy of antiviral medication for treating SSNHL. The current study's findings, which indicate that acyclovir has no discernible benefit in treating this disorder, could be used to shed light on the cause and progression of ear damage. The majority of SSNHL cases might not be brought on by a viral insult, or they might be brought on by an infection with a virus other than herpes, like one that lacks thymidine kinase.

However, a number of research projects and animal investigations support the diagnosis that a viral etiology is most associated with the pathology of SSNHL.[17–22] Wilson[18] proposed that a variety of mechanisms, such as labyrinthitis due to viral infection, Meningitis-induced neuritis or labyrinthitis, central nervous neuropathy, A dormant ganglion cell infection has been reactivated, or alterations in immunological status, could link the herpes virus to the etiology of SSNHL.

Two randomized controlled trials with particular antiviral therapy have been conducted.[10,11] Antiviral medications added to oral steroids alone did not prove to be beneficial in either of these two studies. The antiviral drug acyclovir, when combined with steroid treatment for sudden onset sensorineural hearing loss, does not, however, appear to be beneficial in this investigation's findings.

Depending on the particular viral strain that affect the ear and the precise mechanism of involvement, it is likely that the clinical presentation and therapeutic response will differ. It's also conceivable that the virus produces the ear damage in a very short duration of time and that steroids are the best treatment for the inflammation and other side effects of the virus after that.

CONCLUSION

In individuals with Sudden Sensorineural Hearing Loss, Steroid treatment enhances recovery outcomes considerably. In the treatment of idiopathic sudden sensorineural hearing loss, antiviral therapy did not outperform steroid alone.

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