

# Our experience in patients with sudden sensorineural hearing loss

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## Introduction

Sudden sensorineural hearing loss is defined as the development of sensorineural type hearing loss of 30 dB or more in 3 consecutive frequencies in 72 hours. The exact mechanism of how steroids may improve hearing is still unknown. It has been thought that steroids act mainly by reversing the inflammation in the internal ear. Moreover, they may have the effects of stabilizing endolymph hemostasis by a mineralocorticoid effect, improving stria vascularis functions and potentially cochlear blood flow.

Citicoline is a choice for treatment of cerebrovascular diseases. To sum up, citicoline interferes positively with the brain energy metabolism, stimulates central neurotransmission, activates cell repair mechanisms, decreases ischemic lesion size

We aimed to compare the efficacy of dexamethasone and citicoline combination versus methylprednisolone in patients with sudden sensorineural hearing loss.

## METHODS

This was a retrospective observational cohort study. We included of 98 consecutive patients with idiopathic sudden hearing loss who were admitted to “Astghik MC” clinic during the period 2015 to 2019 and received either dexamethasone & citicoline combination (hereafter referred as an intervention group, n=65) or methylprednisolone (hereafter referred as a control group, n=33).

### Interventions /procedures

We compared the efficiency of two treatment schemes: dexamethasone followed by cyticoline and methylprednisolone as a monotherapy. The patients were divided into two groups. The first group received dexametason 8mg/2ml/3days, then 4mg/1ml/ 3 days and 2mg/0,5ml/ 1day, respectively. After 7 days the patients of first group continue received citicoline 500mg/100ml 0.9% NaCl intravenously 10 days. The patients of second group received methylprednisolone 48mg/7days, then reduced to 4 mg daily until the end of the drug/10days. The first group reduced the duration of steroids, thereby preventing their side effects.

The study primary outcome was the effect of treatment on changes in PTA score. The PTA score was computed as the average of the measured thresholds at 500,1000, 2000 and 4000 Hz frequencies.

We checked the PTA score at baseline (Day 0) before starting the treatment, then at Day 7 and Day 17 after the treatment according to recommended standard procedure in our clinic.

As a secondary outcome, we assessed the proportion of patients who at the end of treatment experienced significant or complete recovery (changes in PTA score  $\geq 9$  unit between baseline and Day 17th) vs no recovery (changes in PTA score  $< 9$  unit, between baseline and Day 17th) in hearing score.

## RESULTS

65 patients received a combination of dexamethasone & citicoline and 33 patients - methylprednisolone. The mean age of study participants was  $48 \pm 13.6$  and 61% were males with no statistical difference observed between groups. Two thirds of participants in both group had moderate to severe hearing loss.

The primary analysis compared changes in patients' mean PTA scores over treatment period between the groups. At time of treatment initiation (Day 0) the mean PTA scores were comparable between control ( $53.4 \pm 18.7$ ) and intervention ( $51.8 \pm 19.6$ ) groups. In both groups the PTA score improved over treatment period. The mean scores at day 7 and day 17 after the treatment initiation were  $40.9 \pm 17.4$  and  $30.9 \pm 18.8$  in control and  $42.2 \pm 20.1$  and  $34.4 \pm 22.0$  in intervention group respectively (Figure 1).

Linear mixed models showed that in both groups the PTA score reduced over treatment period on average by 1.18 per day for control group and by 1.00 per day for treatment group. Difference in daily score reduction of 0.18 (0.01 to 0.38,  $p=0.066$ ) between groups failed to reach statistical significance.

At the end of treatment (Day 17<sup>th</sup>) 84.8 % (n=28) patients in control and 80.0% (n=52) patients in intervention group had experienced significant to complete recovery ( $p=0.757$ ).

Studies show that this treatment also gives good results and significantly reduces the side effects of steroids.

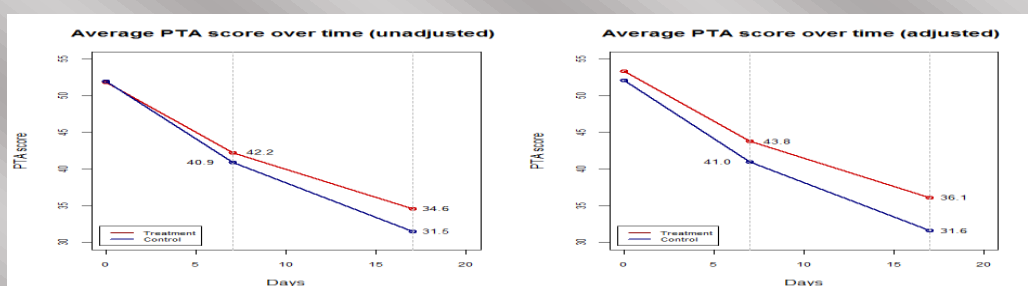


Figure 1. Average PTA score over time unadjusted and adjusted for age and hearing loss severity.