INTRAVENOUS INFUSION OF STEROID AND TORENTAL FOR IDIOPATHIC SUDDEN SENSORINEURAL HEARING LOSS AMONG CASES IN AL-KHOMS TEACHING HOSPITAL, LIBYA

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ABSTRACT

Sudden hearing loss (SHL) is a frightening symptom that often prompts an urgent or emergent visit to a physician. Sudden Sensorineural Hearing loss (SSNHL) is the subset of SHL. Idiopathic sudden sensorineural hearing loss (ISSNHL) is defined as SSNHL with no identifiable cause despite adequate investigation. Objective of this study is to determine hearing recovery in patients with idiopathic sudden hearing loss treated with varying amount of IV infusion Hydrocortisone and Torental (Pentoxifylline) and an improvement of Quality of life among the Idiopathic sudden sensorineural hearing loss patients. A retrospective study was conducted at Al-khoms Teaching hospital, Al-khoms, Libya from October 2011 to September 2013. 75 cases (41 male and 34 females) with sudden hearing loss (Unilateral and or Bilateral) problems, between the age group of 20 and 89 were admitted in this study. The study were designed and grouped into two groups. Group1 with patients have received a course of IV infusion of Hydrocortisone (200mg) and Torental (Pentoxifylline) 200mg for once in a day and group2 with patients have received a course of IV infusion of Hydrocortisone (200mg) and Torental (Pentoxifylline) 200mg for twice in a day. Use of steroid, Hydrocortisone and Torental (Pentoxifylline) has improved the recovery of hearing more than 50% to normal. Torental has helped in speedy recovery by improving blood flow and oxygen. Intravenous infusion of drugs has added the value of recovery quickly which indirectly improved the quality of life among family, friends and Societies.
KEYWORDS: Sudden sensorineural hearing loss, Hydrocortisone, Pentoxifylline.

INTRODUCTION
Hearing loss may result from damage or disruption to any part of the hearing system from simple wax blocking the ear canals, through to age-related changes to the sensory cells of the Cochlea, to damage to the brain. Hearing loss may be mild, moderate, severe or profound. Hearing loss occurs primarily when the inner ear or auditory nerve is damaged or when sound waves cannot reach the inner ear (NIDCD, 2011). Sounds (Loud and long-lasting) can damage sensitive structures in the inner ear and cause Noise-induced hearing loss (NIHL). It is a significant social and public health problems. NIHL can be caused by a one-time exposure to an intense “impulse” sound or noise like explosion or a continuous exposure to loud sound over an extended period of time such as noise generated in an industry or sounds of crackers. Sounds of <75 decibels (dB), even after a long exposure, are unlikely to cause hearing loss. However, too loud, too close or last too long sounds at or above 85dB can cause hearing loss. Krans (2013) explained that the hearing loss can be caused by exposure to loud noises, age, infection (Bacterial and Viral) and some anti-cancer drugs. Age-related hearing loss (Presbycusis) is the loss of hearing that gradually occurs in most of the people as they grow older. Age related hearing loss mostly occur equally in both ears and the loss is gradual.

Sudden hearing loss is defined as a rapid onset, occurring over a 72-hour period, of a subjective sensation of hearing impairment in one or both ears. Sudden sensorineural hearing loss (SSNHL) is a subset of SHL that (a) is sensorineural in nature and (b) meets certain audiometric criteria (Mattox and Simmons, 1977). It can happen instantly or over a span of several days, during which sound is gradually muffled or reduced. This type of hearing loss typically affects one ear. Loosing 30 dB in three connected frequencies is considered SSNHL (Krans, 2013). An incidence of SSNHL range from 5 to 20 per 100,000 persons per year (Byl, 1984). Idiopathic sudden sensorineural hearing loss (ISSNHL) is defined as SSNHL with no identifiable cause despite adequate investigation. Tenenbaum (2013) described the hearing loss usually found in the tiny hair cells that play the crucial role of converting sound waves into nerve impulses for delivery to the brain and treated to regenerate the hair cells by stem cell therapy.

Sudden bilateral sensorineural hearing loss may be vascular, metabolic, autoimmune, infectious, neoplastic, toxic, traumatic, or inflammatory. Acute bilateral hearing loss may
occur by any of these mechanisms, but on rare occasions, these same mechanisms may also produce unilateral hearing loss (Haberkamp and Tanyeri, 1999).

Many different forms of treatments are recommended for idiopathic sudden sensorineural hearing loss. Probst et al. (1992) tested the recovery of SHL patients with infusion of Dextran-40 with Pentoxifylline. Assuming that superoxide anion free radicals (O$_2^-$) may play a role in damage to the inner ear, Henry et al., (2003) investigated the possible benefits of Vitamin E as an antioxidant in the treatment of idiopathic sudden sensorineural hearing loss. There were about 15 studies related to this research reported (till 2007) in Medline in English language (Conlin and Parnes, 2007).

Objective of this study is to determine hearing recovery in patients with idiopathic sudden hearing loss treated with varying amount of IV infusion Hydrocortisone and Torental (Pentoxifylline) and an improvement of Quality of life among the Idiopathic sudden sensorineural hearing loss patients.

**MATERIALS AND METHODS**

A retrospective study was conducted at Al-khoms Teaching hospital, Al-khoms, Libya from October 2011 to September 2013. 75 cases (41 male and 34 females) with sudden hearing loss (Unilateral and or Bilateral) problems, between the age group of 20 and 89 were admitted in this study. Cases were first diagnosed with the help of Tuning fork for middle ear problems and confirmed the sudden sensorineural hearing loss by Audiometer test or Pure Tone Audiogram (PTA), MAICO-ST-32, Germany and later tested by MRI Scan to look an acoustic neuroma. Different sounds and levels can be sent to each ear individually. A series of sounds at different volumes can help to find the level where your hearing fades.

Cases included or excluded in this study were as follows.

1. **Inclusion criteria in the study**
   - Hearing loss of at least 30 dB across contiguous frequencies within 72 hours.
   - Received oral Otrivin steroid treatment.
   - Presented to any physician within 10 days of hearing loss onset.

2. **Exclusion criteria in the study**
   - Children below 12 years old.
   - Cases with acoustic neuroma.
• Non-affected ear with poor hearing (PTA˃6.0 dB).
• Cases with Hypertension and Diabetes mellitus.
• Diseases with Menier’s disease, acoustic injury, retrocochlear diseases and other specifiable disorders.

The cases undergo the treatment were informed about the procedures and collected their consent.

Total cases were grouped into two in related to the dose of medication.

**Group 1**
Received a course of IV infusion of Hydrocortisone (200mg) and Torental (Pentoxifylline) 200mg for once in a day.

**Group 2**
Received a course of IV infusion of Hydrocortisone (200mg) and Torental (Pentoxifylline) 200mg for twice in a day.

The treatments were undergone once or twice for a week in the observation room only.

After treatment, again audiometric evaluation test was undergone to check the improvement in hearing capacity with all the cases.

**RESULTS AND DISCUSSION**
Sudden hearing loss (SHL) is a frightening symptom that often prompts an urgent or emergent visit to a physician.

Table 1: Study of IV infusion of Hydrocortisone and Torental (Pentoxifylline) in different groups of ISSNHL cases.

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Groups</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Group 1</td>
<td>21 (28.00%)</td>
<td>17 (22.66%)</td>
<td>38 (50.66%)</td>
</tr>
<tr>
<td>2</td>
<td>Group 2</td>
<td>20 (26.66%)</td>
<td>17 (22.66%)</td>
<td>37 (49.33%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>41 (54.66%)</td>
<td>34 (45.33%)</td>
<td>75 (100%)</td>
</tr>
</tbody>
</table>

Overall, 38 cases (50.66%) in the group 1 has recovered with a clinically significant amount of hearing. This recovery was associated with immediate treatment (within 2 weeks from onset). Sometimes patients with ISSNHL have recovered normally without any treatment but the chances of recovery are more with the treatment. Use of steroid to the hearing loss was
noted as normal treatment since olden days (Tucci et al., 2002). Bruce et al., (1996) treated the SSNHL patients with steroid and vasodilator and antioxidant (Henry et al., 2003) and observed a significant improvement after treatment. Sudden idiopathic deafness and sudden idiopathic anacusia were treated with corticosteroid and carbogene for 5 days and observed 83% cases were recovered ranging good to complete (Russolo and Bianchi, 1997). It was also observed (group 2) that higher doses (≥400mg/day) of Hydrocortisone and Torental (Pentoxifylline) may cause dizziness and Tinnitus. Coexistent morbidities such as dizziness and tinnitus pose considerable disease burdens for the patient. Dizziness is present in 30% to 40% of cases of SSNHL (Fetterman et al., 1996). Tinnitus is expected to be nearly universal in SSNHL, is difficult to treat, and may pose a significant economic and psychological burden (Chiossoine-Kerdel, 2000). There was a quick recovery of patients in the group 1 when drug was administered through intravenous. Some scientist studied by giving the drug either intramuscular (Russolo and Bianchi, 1997), oral (Chu-Yao et al., 2003) and intratympanic administration (Seiji et al., 2006).

According to the NIDCD (2011), two to three children out of every 1000 in the USA are born deaf or hard-of-hearing; nine out of every 10 children born deaf are born to parents who can hear and approximately 15% of Americans (26million) between the age of 20 and 69 have high frequency hearing loss due to exposure to loud sounds or noise at work or in leisure activities. This alarming and demanded the ENT specialities to find the reason for the ISSNHL.

In this study, use of steroid, Hydrocortisone and Torental (Pentoxifylline) has improved the recovery of hearing more than 50% to normal. Torental has helped in speedy recovery by improving blood flow and oxygen. Intravenous infusion of drugs has added the value of recovery quickly.

**CONCLUSION**

An immediate treatment of patients with unilateral idiopathic sudden hearing loss with once in a day for one week course with the mixture of 200mg Hydrocortisone and 200mg Torental (Pentoxifylline) was showing better result (group 1) and recommended for the treatment of sudden hearing loss type cases. Intravenous infusion of drugs has added the value of recovery quickly which indirectly improved the quality of life among family, friends and Societies. According to W.H.O., half of all cases of deafness and hearing impairment are avoidable through prevention, early diagnosis and treatments.
REFERENCES