

COMPARISON OF SURGICAL AND MEDICAL TREATMENTS FOR SUDDEN HEARING LOSS

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SUMMARY : Sudden hearing loss (SHL) is an acute cochleovestibular syndrome which needs immediate diagnosis and treatment for a cure without sequelae. Comparison among different series is a difficult task because most of the cases are idiopathic, they show variable hearing losses, incidence of spontaneous regression is debatable and also comments on gain in hearing levels (HL) show serious differences. In this article we compared the results of two different treatment protocols, one of which consisted of 18 patients to whom surgical treatment and the other which consisted of 28 patients (36 ears due to bilateral involvement in 8 patients) to whom combined medical treatments were applied. Combined medication encompassed oral steroids, iv dextrane (macromolecular fluid), vasodilators, vitamins B and C and antivertiginous drugs (dimenhydrinate). Surgical treatments consisted of an exploratory tympanotomy, searching for a perilymph leakage (PLF), vein grafting the round window and additional oral steroids.

Key Words : Sudden Hearing Loss, Perilymph Fistula, Surgery, Therapy.

INTRODUCTION

The definition of SHL is acute loss of hearing in three days, of over 30 dB on at least three consecutive frequencies. Vertigo may be seen in 37-50 % of the patients and 70-80% of them may suffer from tinnitus. The most popular four etiologic theories of SHL are the infection theory, vascular theory, autoimmune theory and the rupture theory. The treatment should be chosen according to the etiologic reason if it is found. The etiologic reason of the disease may be found in only 20 % of the cases even if the most advanced diagnostic techniques are used. So the treatment regimens are inconclusive, but may be divided into two main groups: medical and surgical.

MATERIALS AND METHODS

This study was conducted on 46 cases (19 female, 27 male) who were diagnosed as SHL in Ministry of Health Ankara Hospital, ENT Clinic between November 1992 and April 1995. Sixteen bilaterally involved ears of 8 cases and 38 unilaterally involved cases were studied. The mean age was 44.5 ± 17.4 years. Only the cases who applied within 30 days after the onset of the hearing loss were accepted to this study. All the cases were hospitalized, detailed history was noted, and full ENT, otoneurologic physical and laboratory examination was made. According to these examinations and findings, the patients were divided into two different treatment protocols.

Group 1: Combined medication. 100 mg methyl prednisolone im on the first day, from the second day on 1mg/kg oral prednisolone was given in gradually decreasing doses over 18 days; Dextrane (Rheomacrodex) 500 cc iv once a day, five days; Vasodilator (Progeril retard = dihydroergotoxin ethansulphonate 2.5 mg + papaverine HCl 150 mg, 2x1 p.o.); Vitamins B and C (Bemiks C, 1x1 p.o.); Antivertiginous (Dramamine tablet = dimenhydrinate, 3x1) to the ones with vestibular complaints.

Group 2: Surgical treatment. PLF in oval and round windows was searched by exploratory tympanotomy under local anesthesia. Whether a fistula was found or not, the round window was grafted with a vein graft supplied from the dorsum of the hand of the patient. Oral steroid was also given to maintain ionic balance in scala media.

Five days of bed rest, limitation of physical activity, and a poor salt diet were advised to both groups. Smoking and alcohol intake were forbidden also.

Criteria for patient selection: For group 1: bilateral involvement, having systemic disease, application after the tenth day of the SHL onset, refusal of the operation. For group 2: history of trauma, SHL in the only hearing ear and having profound hearing loss. According to these criteria, 18 patients were included in group 1 and 28 patients in group 2. There were 36 ears in group 1 due to bilateral involvement in 8 patients.

Pure tone audiograms (PTA) of the patients at the application time were taken. According to averaged PTA levels, 22 % of the ears had a mild-moderate hearing loss (HL), 24 % had a profound HL, 54 % had a deep profound HL.

Among probable etiologic factors were history of upper respiratory tract infection in 63 %, stress in 35 %, and barotrauma history in 4% according to detailed patients' histories. There were tinnitus in 89 % and vertigo in 44 % of the patients. Hypertension and/or diabetes mellitus in 14, high ESR in 6, cervical degenerative changes in 5 patients were detected. The computerized tomography examinations of the brain and cerebellopontine angle were normal. Hearing results after the treatment were evaluated as follows: No gain, less than 15 dB improvement in PTA: Mild gain, more than 15 dB improvement but the hearing level under 45 dB in PTA: Moderate gain, 16-25 dB improvement and HL was between

25-45 dB in PTA; Full gain, HL was better than 25 dB in PTA or recovered hearing to the previous HL, or to the other healthy ear HL. First and second levels were accepted as unsuccessful while third and fourth levels were accepted as successful results (SR).

RESULTS

SR rates were 67 % in group 1 and 56 % in group 2. In the first ten days of onset 33 patients applied. While the SR rates were 67 % in these, it was 57 % in the others. The SR rates were 75 % in the 15-39 age, 57 % in the 40-59 age and 43 % in the over 60 age groups. In the group with a high ESR the SR rate was 33 % but it was 67 % in the normal ESR group. The SR rates were 45 % in the SHL with vertigo group and 74% in the group without vertigo. Again they were 49% in the SHL with tinnitus group and 85% in the group without tinnitus. All the differences of the rates above were not significant statistically. SHL was with systemic diseases in 14 patients and a SR was obtained in only 4 of them (29 %) whereas this rate was 75 % in those without systemic disease ($p < 0.01$). The SR rates according to the PTA patterns were as follows: 75 % in low-frequency HL, 50 % in high-frequency HL, 30 % in flat HL and 10 % in deep profound HL ($p < 0.01$). PLF was determined in 7 of the 18 ears (39 %) in group 2. The SR rates were 55 % in those with a positive PLF and 57 % in those with a negative PLF, the difference being not significant.

DISCUSSION

Cochlear membranous defects may play a role in the etiopathogenesis of SHL (5). Ruptures in the labyrinthine system change the inner ear ionic balance, vibratory energy transmission and inner ear compliance and cause SHL (6).

Shei and Sheehy performed exploratory tympanotomy only in cases with a history of barotrauma. Mattox and Simmons advised surgery for SHL in cases whose hearing got worse by daily audiometric examinations or had an increasing vertigo. Singleton reported SR in 3 of the 19 cases who underwent surgical treatment, and in 9 of the 15 cases who were treated medically. Shelton and Simmons reported that results of surgical treatment were not better than spontaneous recovery (1, 2, 6, 8, 9, 12, 13, 14). Hoşal et al described a PLF in 70 % of the 46 cases who underwent surgery and reported the success rate as 71 % (4). Goodhill (1971) found a PLF in 12 of 18 cases and McCabe in 154 of 257

cases (3, 7).

Indication of surgical treatment for SHL is still controversial. Also the accuracy of suggested diagnostic tests for PLF are inconclusive. Occurrence of nystagmus by applying pressure to the external ear canal (Hennebert sign) has been used as an indication of surgical exploration for years. Podoshin et al. reported that the most valuable preoperative diagnostic criteria for a PLF were a positive fistula test and the presence of a positional nystagmus in ENG (11).

In different series, there are debatable reports about the degree of reliability of the presence of vertigo, nystagmus, shape of the audiogram, the results of the caloric test, fistula test, ECoG, ENG and positioning test that might be evaluated separately or in combination. Other diagnostic methods of a PLF are intraoperative techniques, so there is no place for them on putting an indication for surgery.

Immediate surgery may cause additional vibratory trauma to the inner ear. On the other hand perilymph fistulae recover spontaneously within two weeks. Obliteration has been suggested even in the absence of a fistula during surgical procedures (1, 2, 6, 9, 12, 14).

In USA, 167 ENT surgeons replied a questionnaire about the indications of surgery in a PLF. The results derived from this study were as follows: 59 % of them stated that the primary indication for surgery was clinical sense and the most important impressions for clinical sense were barotrauma history (61 %) and trauma exposure (52 %); 72 % of them were not in favor of surgery in a stabilized HL; 78 % of them were in favor of grafting both in the presence or absence of a PLF (5).

The dizziness recovers immediately after repairing the PLF. But the other symptoms may not recover due to irreversible changes of the inner ear (10). The main objects of surgery are rather to preserve hearing and restore vestibular symptoms than providing hearing gain (6).

We found out a PLF in 7 of the 18 ears (39 %) that we explored. All the fistulae were at the round window. There was a PLF in both of the 2 cases having a history of trauma. The SR rates were 57 % in ears with a PLF, 56 % in ears without a PLF. A SR was achieved in 67 % of the ears in group 1 and in 56

% in group 2. The differences were insignificant.

SHL may depend on different etiologic factors. So a standard treatment protocol can not be applied to all cases. Medical and surgical treatments are not contrary to each other and both may be useful by appropriate patient selection. History is still playing an important role in selection of the treatment protocol since there is not an accurate and practical diagnostic method for a PLF. Especially in the presence of a trauma history, surgical treatment should be chosen. Presence of vestibular symptoms is irrelevant to the probable etiology of SHL. However, if vestibular symptoms do not disappear in 10 days in spite of medical treatment, surgical exploration should be considered. Presence of vestibular symptoms, delayed treatment, aging, profound HL, association with systemic disease and high ESR may effect the prognosis poorly.

The PTA patterns at the application time may give an idea about the prognosis. The prognosis is better in flat or low-frequency HL than in profound or high-frequency HL. It is accepted that presence of tinnitus does not have an effect on prognosis but in our series, while the SR rates were 49 % in ears with tinnitus, it was 85 % in ears without tinnitus.

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