Treatment of Ménière’s Disease with the ‘Modified Seigel’s Device’ – How I do it

Ménière’s disease is an idiopathic inner ear disorder characterised by symptoms of episodic vertigo and fluctuant hearing loss, tinnitus and ear pressure. The vertigo attacks are incapacitating and may lead to chronic vestibular dysfunction and disequilibrium. A distended scala media (i.e. endolymphatic hydrops) is the histopathologic hallmark of Ménière’s disease. Medical therapy aimed at decreasing endolymph volume (low-sodium diet, diuretic use) is the standard initial treatment. In approximately 30% of cases, the vertigo attacks do not respond to conservative medical therapy. Local over-pressure treatment approach is effective in controlling vertigo in people with intractable Ménière’s disease. The short-term and long-term efficacy has been demonstrated by using the Meniett Low-Pressure Pulse Generator. I report my experience with the ‘Modified Seigel’s device’ that I have developed for the treatment of Ménière’s disease. This is a simple, non-invasive and cost-effective method, which is very economical when compared to the Meniett device.

Method

Ten patients, aged between 30 and 65 years, with active medically intractable symptoms of Ménière’s disease were included in this study. All patients in the study had Ménière’s disease according to the criteria of the Committee on Hearing and Equilibrium of the American Academy of Otolaryngology, Head & Neck Surgery (AAO-HNS, 1985).

A titanium tympanostomy tube, which is bigger in diameter than the usual grommet and hence remains patent longer, is placed under local anesthesia in postero-inferior quadrant (Figure 1). Using the modified Seigel’s device, intermittent trans tympanic pressure is applied for five minutes on each sitting. The modified Seigel’s device consists of a snugly fitting aural speculum, connected through a plastic tube to a blood pressure bulb with valve. The blood pressure bulb with valve helps in controlling pressure generation with varying intensity. There is another tube in the circuit connecting the tube to the sphygmomanometer (Figure 2). Each pressure pulse when correctly applied by fully pressing the blood pressure bulb will generate a pressure of up to 200mmHg as measured by a sphygmomanometer (Figure 3). My experiences with the patients have suggested that pressures between 180-200mmHg as measured by the sphygmomanometer give good results. Before each application the patient is instructed to check for patency of the tympanostomy tube. This is ascertained by performing the Valsalva manoeuvre before each sitting when the patient experiences a hissing sound when the air leaks from the middle ear through the tympanostomy tube. The patient is instructed about the technique of applying the pressure pulse at home three times per day and performs the first application in the clinic under supervision (Figure 4). Disease severity was scored and evaluated pre and post-treatment under the guidelines proposed by the Committee on Hearing and Equilibrium in the American Academy of Otolaryngology-Head and Neck Surgery. The mean follow-up time was 18 months. The Institutional Review Board has approved this study.

Results

In my series, the disability in patients with Ménière’s disease was largely due to vertigo. Of the ten cases, the number of patients and the degree in controlling vertigo after the treatment were: at 18 months, eight cases (80%) with substantial, two with limited control respectively. Four patients (40%) showed a significant hearing gain of over 10 dB; two patients (20%) with 6 dB gain, the remainder had no improvement in hearing (40%). There were no complications during the treatment with our ‘Modified Seigel’s device’.

Discussion

It has been known that fluctuations in ambient pressure, such as increasing altitude, are associated with an improvement in Ménière’s symptoms. The first attempts to control the symptoms in Ménière’s dis-
Ease by ambient pressure changes were made when patients with acute symptoms were treated in a hypobaric pressure chamber. Since then, pressure chamber therapy has been used with some success for acute effects, but this is cumbersome and not widely available.

In the study, Rajan et al. investigated the long-term efficacy of the Meniett device and found it to be effective in the management of recalcitrant vertigo in Ménière’s disease. In this study, a newer ‘Modified Seigel’s device’ has been used to treat intractable Ménière’s disease. This treatment is safe, simple, cost-effective, portable, non-destructive, non-invasive and with domiciliary treatment. The blood pressure bulb with valve in this device helps deliver intermittent pulse pressures that are transmitted to the inner ear through a tympanostomy tube in the postero-inferior quadrant.

The mechanism, whereby external pressure changes labyrinthine physiology is incompletely understood. The mechanism of intermittent low pressure waves pass through a tympanostomy tube to round a window membrane and transmitted to perilymph and compress endolymphatic labyrinth to redistribute endolymph pressure to sac and blood vessels. Alternative explanations involving oxygenation, hormones (atrial natriuretic peptide), and downregulation of fluid production have been offered.

This treatment is recommended when dietary restrictions and conservative medical treatment have failed to relieve the symptoms of the patient. Its place in the management hierarchy of Ménière’s disease is between pharmacotherapy and surgery. In their study, Gates et al. emphasised that due to the cost of the Meniett device, it should not be recommended until standard medical therapy has been used and deemed unsuccessful. By considering the advantages of our device and its cost effectiveness, the indications can be broadened.

**Summary**

Eighty percent of our patients showed significant reduction in symptoms of Ménière’s disease. Sixty percent of the patients displayed an audiometric improvement. There were no complications during the treatment with our ‘Modified Seigel’s device’. Hence, I recommend the use of the ‘Modified Seigel’s device’, which is a safe and cost-effective option for people whose symptoms of vertigo are poorly controlled by lifestyle change and medical therapy.

**References**