العلاج التأهيلي في مرضي خلل الاتزان الطرفي

رسالة

مقدمة كجزء متمم

للحصول علي درجة الدكتوراة في علم السمع

مقدمة من

الطبيبة/ هدايت السيد محمود الفولي

تحت إشراف

الاستاذ الدكتور/ احمد سامح حسني فريد

أستاذ الأذن و الأنف و الحنجرة

عميد كلية الطب

جامعة القاهرة

الاستاذ الدكتور/محمد طارق عبد العزيز خنوه

أستاذ أمراض السمع و الصمم

كلية الطب جامعة القاهرة

كلية الطب

جامعة القاهرة

٢٠٠٧

Contents

List of figures

List of tables

Abstract

Objective: To determine the outcome of vestibular rehabilitation protocols in subjects with peripheral vestibular disorders compared with abnormal control subjects. **Study Design:** Randomized study using repeated measure, matched control design. Subjects were solicited consecutively according to these criteria: vestibular disorder subjects who had abnormal results of computerized dynamic posturography (CDP) sensory organization tests (SOTs) 5 and 6 and/or canal paresis. Besides, unresolved BPPV. **Subjects:** Men and women over age 18 with chronic vestibular disorders and chief complaints of unsteadiness, imbalance, and/or motion intolerance. **Interventions:** Pre- and post-rehabilitation assessment included CDP, & DHI. Individualized rehabilitation plans were designed and implemented to address the subject's specific complaints and functional deficits. Supervised sessions were held at weekly intervals, and self-administered programs were devised for daily home use. **Main Outcome Measures:** CDP composite and vestibular ratio scores, self-assessment questionnaire results (DHI scores). **Results:** Subjects who underwent rehabilitation (Group A) showed statistically significant improvements in SOTs, overall composite score, and DHI scores, abnormal (Group B) control groups had statistically significant improvement as regards DHI scores only. **Conclusions:** Outcome measures of vestibular protocol physical therapy confirmed objective and subjective improvement in subjects with chronic peripheral vestibular disorders. These findings support results reported by other investigators.

Key Words: Vestibular rehabilitation—Peripheral vestibular disorders— Computerized dynamic posturography—Sensory organization testing—DHI.

Acknowledgment

I would like o express my greatest appreciation to Professor Dr. Ahmad Sameh Hosni Fareed for his support, help, continuous encouragement and precious time.

I would like also to express my gratitude to Professor Dr. Mohammad Tarek Ghanoum, for his supervision and valuable advice.

Finally, I would like to thank my family, friends, and colleagues for their help and support.

Aim of The Work

1. To determine the objective response to individualized vestibular rehabilitation therapy (VRT) protocols in subjects with peripheral vestibular disorders.
2. To determine the effectiveness in decreasing some symptoms, such as vertigo, and increasing performance of daily life skills after VRT.
3. To manage benign paroxysmal positional vertigo (BPPV) patients, who has been under successful canal repositioning procedures, and still complain of vertigo or unsteadiness.

Conclusions

1. Outcome measures of vestibular rehabilitation protocols confirmed objective and subjective improvement of balance and dizziness handicap in patients with peripheral vestibular disorders.

2. Based on an understanding of the vestibular system, the balance system, and normal functional capabilities, appropriate rehabilitative exercises can be designed for patients with chronic vestibular loss.

3. Vestibular rehabilitation improves symptoms, postural stability, and dizziness-related handicap in patients with chronic dizziness.

4. Successful vestibular rehabilitation therapy improves activities of daily living.

5. The results indicate that home-based exercises can significantly improve balance abilities in people with chronic vestibular dysfunction.

6. We believe that vestibular habituation retains a useful role in the treatment of BPPV.

Discussion

Vestibular rehabilitation therapy is not new. It has long been recognized clinically as an effective method of managing peripheral vestibular disorders. In 1944, Cawthorne proposed a physiologic basis for head exercises for treatment of "giddiness" (vertigo).Vestibular rehabilitation therapy clearly and unequivocally improves both function and symptoms in patients with peripheral vestibular disorders **(*Black et al.*, 2000)**.

This randomized controlled study was conducted on 45 patients, in the period from October 2004 to October 2006. Their ages range from 21 to 69 years old, their mean age is 43.9 (SD 12.9). The whole study group was divided into two groups; group A (study group), which included patients suffering from vertigo, with canal weakness or abnormal SOT, or both. This group consists of 34 patients. The other group, group B (control group), included patients having same complaints, and findings as group A, but these patients weren't subjected to VRT, as with group A patients. This group included 11 patients.

Group A had 17 female, and 17 male patients, while group B had 6 female and 5 male patients.

The assessment of all patients was done initially before starting VRT, and were re-evaluated later after 3 months of VRT sessions (study group), or after 3 months duration in the control group.

Assessment included; objective measures which are; hearing status of the patients, search for spontaneous nystagmus, oculography, positional and positioning tests (searching for BPPV cases), caloric testing, SOT (composite, and vestibular ratio scores).

Though SOT testing is a popular measure in assessing patients with peripheral vestibular disorders, and assessing improvement related to VRT, still some authors might find it an invalidated measure in assessing the functional limitations in those patients. ***O'Neil et al, (1998)***, assessed the validity of SOT, and they found that SOT lacks concurrent validity with functional and gait performance measures in patients who present with peripheral vestibular hypofunction and requested VRT for their postural instability. Accordingly, SOT by itself is not a useful measure to assess changes in balance and functional performance in patients with vestibulopathy.

We also included a subjective assessment in the form of DHI to better analyze the patients symptoms and disabilities related to these symptoms.

Group A patients had 15 patients with normal hearing status, 16 with unilateral SNHL, and 3 with bilateral SNHL. Group B patients had 5 patients with normal hearing levels, 5 with unilateral SNHL, and one patient with bilateral SNHL.

Both study groups had patients with BPPV, who had been under various treatments including canal repositioning procedures, but still complain of postural instability or unsteadiness. Our aim in including those patients was to find other strategy in treating persistent BPPV cases.

All patients in group A were subjected to VRT for 3 months, based on weekly supervised sessions, and home based exercises. The VRT program was designed for every patient according to his or her complaints. All patients were subjected to postural exercises, as it has been proven to improve the outcome of patients in performing better in daily activities, and even in vestibular testing. According to symptoms present, some patients were given gaze stabilization exercises, habituation exercises designed to facilitate central nervous system compensation by extinguishing pathologic responses to head motion, , and general conditioning activities. The

progress of exercises depends on the amount of improvement shown by each patient in the weekly visits. As the performance gets better the amount and quality of exercises are increased, but either the number or the quality of exercises are increased each time, this enables the patients to better understand and perform in the program.

Much of our findings results from an individualized VRT program for each subject. By tailoring the VRT approach to each patient's specific functional deficits and symptoms, and by making frequent adjustments based directly on their progress or lack of progress, we have observed positive responses in almost all our subjects.

The composite score in our study showed high statistically significant improvement (P=0.001) after completion of VRT, compared to results obtained pre-VRT. These results are matching with those obtained by **Badke et al. (2005)**, who found significant improvement in composite SOT scores. **Perez et al,(2006)** also confirm this finding that SOT scores improved in the 37 patient they conducted VRT on for 5 weeks interval. These findings were obtained by **Brown et al, (2001), Black et al, (2000), Blakley et al (1999), Yardley et al, (1998), Cass et al. (1996)** and **Shepard et al. (1993)** too, who documented that physical therapy results in an improvement in balance in patients with peripheral vestibular disorders. These studies suggested that after full compensation, results of posturography tests normalize and patients lose their abnormal vestibular pattern. **Cohen & Kimball (2004)** also studied effect of VRT on gait, balance, and ataxia, and found that SOT scores had improved significantly in addition to improved time to perform TUG.

On the other hand we found that the vestibular ratio improved, yet the improvement didn't reach a statistically significant value (P=0.12). Our findings, Among all patients in both groups, the post-VRT (or after 3 months in the control group), the vestibular ratio improved to an insignificant value, though the equilibrium scores did improve to a statistically significant figure, denoting that VRT improves