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TRV Chair for Diagnosis and Management of BPPV; An Audit Study

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Introduction

Benign paroxysmal positional vertigo (BPPV) is the commonest cause of vertigo in adults with a lifetime prevalence of 2.4% (von Brevern et al, 2007; Thompson and Amedee, 2009). There are three subtypes based on the semi-circular canal affected by the condition. The most frequent type is posterior canal BPPV which is thought to represent 81-89% of cases, followed by lateral canal with 8-17% and anterior canal with 1-3% (Fife et al, 2008). A recent study using a repositioning chair finds 19% of patients with BPPV have “non-posterior canal” BPPV (Luryi et al, 2018).

The traditional positional tests (Dix-Hallpike and Roll) are often clinically performed with a standard couch and the naked eye, but Video Frenzel equipment is recommended to avoid visual suppression of nystagmus, especially for the detection of lateral canal BPPV (Fife et al, 2008; Hilton and Pinder, 2014; Johkura, et al, 2008; West et al, 2012). Regarding management, current evidence is that the Epley Manoeuvre for the posterior canal is 80-85% effective with 1-3 manoeuvres (Herdman et al, 1993; Helminski et al, 2010; Hughes et al, 2015) and the Lempert manoeuvre for the treatment of the lateral canal is 50-90% effective with up to three manoeuvres (Fife et al, 2008; White et al, 2005; Caruso and Nuti, 2005; Varela et al, 2001; Nuti et al, 1998; Lempert et al, 1996). Some clinicians use modified manoeuvres (e.g. modified Semont) with a reported high success rate (Casani et al, 2002); while others argue that the Lempert manoeuvre is often challenging to perform clinically (Vanucchi et al, 2005). At the moment, there is no evidence of a consistently defined treatment for anterior canal BPPV.

Preliminary data suggest that the controlled nature of both the diagnostic movements and combined canal repositioning manoeuvres on the TRV Chair should in theory enhance the diagnostic as well as the repositioning success rate beyond that of conventional methods (Richard-Vitton et al, 2005;Tan et al, 2014; West et al, 2015 ; Qi et al, 2016; Luryi et al, 2018).

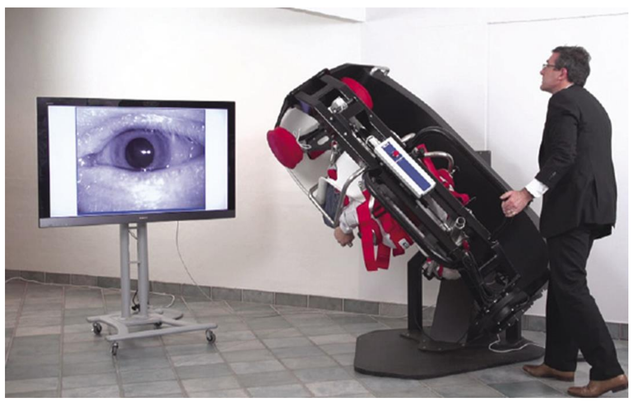

Figure 1

Figure 2

Objective

The objective of this Audit is to evaluate the clinical effectiveness and efficiency of the TRV Chair in diagnosing and treating BPPV compared to the traditional assessment performed on the couch under direct observation with naked eyes.

Method

This Audit (reg number) looked at data from 133 patients, with reported positional vertigo symptoms, who were referred by their General Practitioners to the Audiologist-Led or Neuro-otology Clinics at the Royal National Throat, Nose & Ear Hospital. All patients underwent complete audiological and neuro-otological evaluations. Patients were excluded if there was any pervious history of documented peripheral or central vestibular dysfunction. The demographic and clinical features of patients are shown in Table 1.

The vertigo treatment and rehabilitation chair combined with videonystagmoscopy (TRV chair) were used for the assessment and rehabilitation of BPPV. Prior to this, the traditional positional tests (Dix-Hallpike and Roll) were performed on all patients. Treatment manoeuvres were based on Epley (1992), Semont (1998) and Lempert (1996) repositioning manoeuvres (Richard-Vitton, Petrak and Beck, 2013).

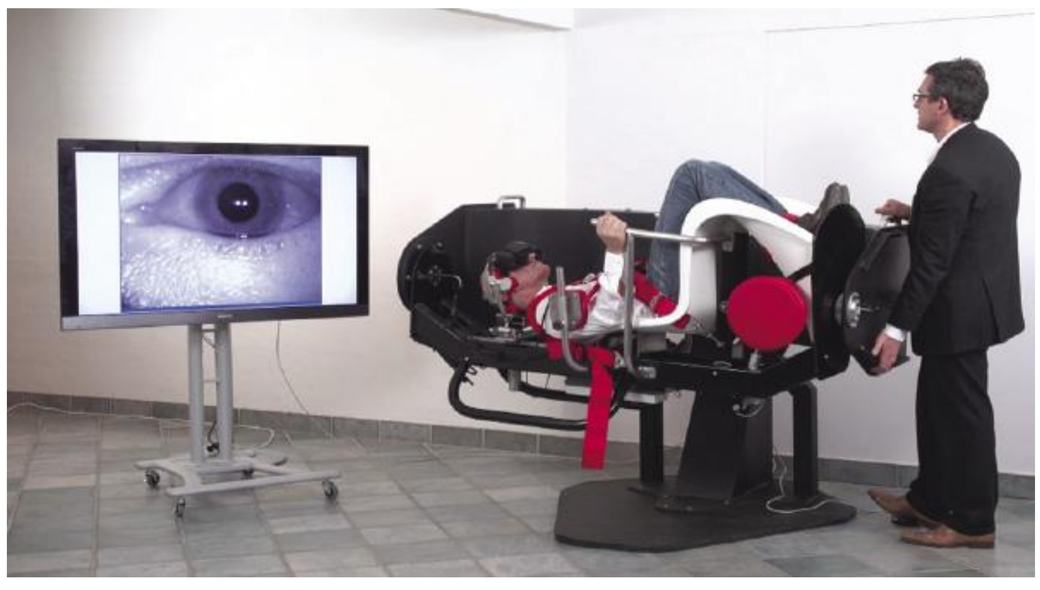

Figure 3

Features	
Sex ratio (male/female)	42/91
Mean age (years) +- SD (range)	53.8 +- 1.3 (21-82)
Symptom duration (months) +- SD	
Total	10.8 +- 17.8
Lateral	10.4 +- 9.6
Posterior	7.2 +- 7.1
Lateral and Posterior	10.3 +- 8.5
Anterior	-
No BPPV	21.6 +- 43.3
Affected canal (N/L/P/L&P/A)	(18/26/43/45/1)
VHIT Results (Negative/Positive)	
Total	101/17
Lateral	21/2
Posterior	36/4
Lateral and Posterior	28/9
Anterior	-
No BPPV	16/2

Table 1: Demographic and clinical features of patients. KEYS: N, none; L, lateral; P, posterior; A, anterior; VHIT, video head impulse test

Results

Of 26 patients with lateral canal BPPV, diagnosed using TRV chair, only eight (31%) cases were correctly identified with the traditional method. However, the hit rate for the diagnosis of posterior canal BPPV was slightly higher with 57% success rate (24 out of 42). Using the TRV chair, 45 patients were identified with both lateral and posterior canal BPPV. The traditional positional tests could only identify 18 of these (40% hit rate).

Total number tested (n)	133
Positive for BPPV	112
Successfully Treated with TRV	102 (91%)
Average No of Manoeuvres	1.4

Discussion

Our data suggests that involvement of the lateral canal is quite common if patients have obvious posterior canal BPPV (45 out of 87). The conventional positional tests only detected 40% of cases with multi-canal involvement. For an accurate diagnosis and appropriate treatment, it would be more beneficial to use videonystagmoscopy because the eye movements can be enlarged and displayed on the screen to increase the level of the details. Those patients treated with an Epley or Semont manoeuvre that no longer have nystagmus in the Dix-Hallpike positions but still report symptoms should be investigated for lateral canal BPPV to avoid unnecessary onward referrals or invasive investigations. This follows previous evidence from Aw et al.’s study (2005) performed with scleral search coils and the recent data from Luryi et al (2018). Further studies should be completed with a comparison against Video Frenzel equipment alone. In addition, a prospective evaluation of the TRV Chair manoeuvres vs. traditional bedside manoeuvres will yield a true picture of the TRV Chair’s clinical efficiency. Our data suggests that the controlled movements offer an advantage compared to the variability of bedside testing.

References

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