

# How many Epley manoeuvres are required to treat benign paroxysmal positional vertigo?

D HUGHES<sup>1</sup>, A SHAKIR<sup>1</sup>, S GOGGINS<sup>2</sup>, D SNOW<sup>1</sup>

Departments of <sup>1</sup>Otolaryngology and <sup>2</sup>Audiology, Wrexham Maelor Hospital, Wales, UK

## Abstract

**Objective:** To evaluate the total number of Epley manoeuvres required to provide symptomatic relief to patients newly diagnosed with benign paroxysmal positional vertigo.

**Methods:** This retrospective audit assessed every patient referred to the audiology department for investigations of their symptoms over a period of one year. Only patients diagnosed with benign paroxysmal positional vertigo confirmed via a positive Dix–Hallpike test result, with no suggestion of dual pathology, were included.

**Results:** Seventy patients with a positive Dix–Hallpike test result were identified. The total number of Epley manoeuvres required ranged from one to five. Thirty-three patients (47 per cent) were asymptomatic following one Epley manoeuvre. Eleven patients (16 per cent) needed 2 manoeuvres and 15 patients (21 per cent) required 3 manoeuvres for symptomatic control.

**Conclusion:** Symptomatic control of benign paroxysmal positional vertigo was obtained following a single Epley manoeuvre for 47 per cent of patients. The majority of patients (84 per cent) experienced symptomatic improvement following three Epley manoeuvres.

**Key words:** Benign Paroxysmal Positional Vertigo

## Introduction

Suspected benign paroxysmal positional vertigo (BPPV) is a common reason for referral to ENT departments. The disease is characterised by intense episodes of vertigo that are induced by head movements.<sup>1</sup> It is not uncommon for patients to suffer from nausea and visual disturbances during these episodes.<sup>1</sup> Patients classically describe symptoms of BPPV when they turn in bed or look upwards.<sup>1,2</sup> Studies have demonstrated that BPPV significantly impairs a patient's quality of life.<sup>3</sup> Uncontrolled BPPV is both restrictive and debilitating for the patient. It can adversely affect the individual's ability to complete their everyday routine.

Despite highly sensitive diagnostic tests (e.g. Dix–Hallpike) and treatment options, BPPV is often misdiagnosed and poorly managed.<sup>4</sup> The Epley manoeuvre is acknowledged as being a safe and effective treatment for BPPV.<sup>5,6</sup> Current National Institute for Health and Care Excellence guidelines advocate the use of the Epley manoeuvre in the management of BPPV.<sup>7</sup> However, the guidelines do not state the quantity of Epley manoeuvres required to provide symptomatic relief or the duration of follow up.<sup>7</sup> This study assessed the number of Epley manoeuvres and

follow-up audiology clinic appointments required to achieve symptomatic control and successful discharge.

## Materials and methods

No ethical approval was required for this retrospective audit.

All patients referred to the audiology department between March 2012 and March 2013 for further investigation of 'vertigo', 'dizziness' and non-specific 'light-headedness' symptoms were assessed.

During the first consultation, the audiologist reviewed the patient's clinical history and assessed for any features suggestive of dual pathology. A Dix–Hallpike test was used to confirm the diagnosis of BPPV. The diagnostic criteria used in this study for a positive Dix–Hallpike test result included: the delayed onset of symptoms following positioning of the patient's head, torsional and fatigable nystagmus, and the reversibility of symptoms with patient repositioning.

At each follow-up consultation, the audiologist enquired about the patients' symptoms in order to assess treatment effectiveness. Their subjective response was recorded and patient status was

categorised as follows: asymptomatic, major improvement, mild improvement or no improvement.

Clinical data were collected from the departmental database and, when appropriate, from the patients' clinical notes. We recorded the total number of Epley manoeuvres and follow-up appointments required for each patient prior to discharge. All patients diagnosed with BPPV (confirmed via a positive Dix–Hallpike test result), who were treated successfully with the Epley manoeuvre and subsequently discharged from the audiology service, were included in this study.

## Results

A total of 120 patients were identified; however, 50 patients were excluded as there was no positive Dix–Hallpike test result. Hence, there were a total of 70 patients in this study (83 per cent female and 17 per cent male). The mean age of the patients was 61 years (range, 20–91 years).

Patients' presenting complaints were recorded. Fifty-two patients (74 per cent) presented with classical BPPV symptoms. The remaining patients presented with vertigo (eight patients), imbalance (eight patients) and non-specific dizziness (two patients).

Of the 70 patients with a positive Dix–Hallpike test result, 26 had right BPPV, 28 had left BPPV and 16 had bilateral BPPV. Four patients had nystagmus present for over 30 seconds. The dataset differentiated between positive, mildly positive or negative test results (Table 1).

All but one patient had an Epley manoeuvre performed during the first audiology clinic appointment; one patient with severe neck osteoarthritis was unable to undergo an Epley manoeuvre at her initial appointment, but it was performed on a subsequent occasion. Of the 69 patients that had an Epley manoeuvre during the first appointment, 61 (87 per cent) required 1 manoeuvre, 7 required 2 manoeuvres and 1 required 3 manoeuvres.

The average first follow-up appointment was four weeks after the initial assessment. All patients were invited to attend follow-up appointments. Sixty-five patients (93 per cent) attended follow-up appointments. The five patients (7 per cent) that did not attend underwent a telephone consultation; each patient stated that they were asymptomatic following their initial appointment and felt that they did not need follow up.

TABLE 1  
INITIAL DIX–HALLPIKE TEST RESULTS\*

Dix–Hallpike test result	Number of patients (%)
Left mildly positive	6 (9)
Left positive	27 (39)
Right mildly positive	8 (11)
Right positive	29 (41)

\*Obtained at first audiology appointment

Symptom severity was reassessed at the first follow-up review. Most patients (26 patients; 40 per cent) reported being asymptomatic following their initial appointment. Thirteen patients (20 per cent) described a major improvement in their symptoms, 22 patients (34 per cent) stated there was a mild improvement in their symptoms and 4 patients (6 per cent) had experienced no symptomatic improvement.

Of the 65 patients reviewed, 63 (97 per cent) underwent a further Dix–Hallpike test, with 2 patients refusing the test. Repeat Epley manoeuvres were undertaken on those with positive Dix–Hallpike test results (34 patients; 52 per cent).

Most patients (38 patients; 58 per cent) were discharged following the first follow-up review as they were asymptomatic. Twenty-seven patients (42 per cent) required further follow up. Those who were discharged had 'open' access to the service; the patients were given a direct telephone number that allowed them to book further appointments if needed.

Second follow-up appointments proceeded as for the first follow-up appointments: patients were re-examined and treated as appropriate. This process was repeated as required.

The total number of follow-up audiology clinic visits needed prior to discharge ranged from one to five visits (Figure 1). The five patients that did not attend their first scheduled follow-up appointment were excluded from the analysis. Thirty-eight patients (58 per cent) were successfully discharged following one follow-up appointment. The vast majority of patients (94 per cent) were discharged following three or fewer follow-up appointments.

The total number of Epley manoeuvres required for symptomatic control ranged from one to six (Figure 2). Thirty-three patients (47 per cent) were asymptomatic following one Epley manoeuvre. The majority of patients (84 per cent) were asymptomatic following three Epley manoeuvres.

## Discussion

This study presents the range in the number of Epley manoeuvres required for symptomatic resolution of

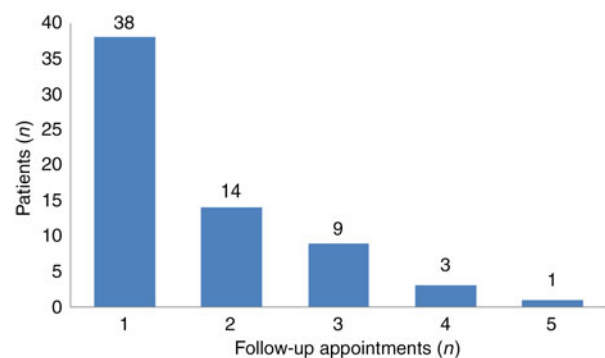


FIG. 1

Number of audiology appointments required prior to asymptomatic discharge from the department.

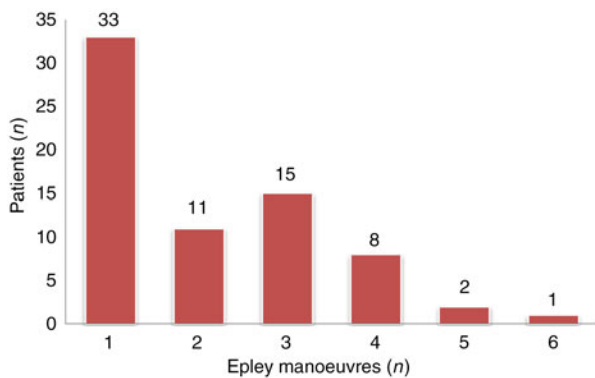


FIG. 2

Total number of Epley manoeuvres required for symptomatic control.

BPPV. It addresses an area of weakness within the current literature. It also demonstrates the total number of follow-up appointments required prior to discharge. This information can be utilised by clinicians whilst obtaining patients' consent for treatment or when explaining the intended follow-up period.

The study has highlighted that symptomatic control of BPPV can be achieved with one Epley manoeuvre for the majority of patients. The Epley manoeuvre is a safe, non-invasive and effective treatment option that is commonly utilised. Despite data demonstrating significant improvement in symptoms following one Epley manoeuvre, the study also emphasises the need for continuity of care and follow up. Patients should be reassured that if there are no improvements in symptoms following their initial Epley manoeuvre, they may require further follow-up appointments. In this study, 94 per cent of BPPV patients became asymptomatic with three or fewer follow-up appointments.

The strength of this study lies in the continuity of the patient follow up and the BPPV service database. Patients were assessed by the audiology service from their initial appointment to their discharge. All patients with a negative Dix–Hallpike test result were excluded from the study.

There is ample evidence to support the effectiveness of the Epley manoeuvre as a treatment option.<sup>5,6</sup> However, the total number of Epley manoeuvres required per patient has not been recorded. In a study by Prokopakis *et al.*, the total number of Epley manoeuvres performed on 592 BPPV patients was recorded for the initial assessment, but the number of Epley manoeuvres required following the initial assessment was not recorded.<sup>8</sup> Bruintjes *et al.* assessed long-term follow up following Epley manoeuvres, reviewing patients at 1, 3, 6 and 12 months; however, they did not reveal how many follow-up visits were required per person prior to discharge.<sup>9</sup>

Our data have demonstrated that the majority of patients (84 per cent) achieved symptomatic relief with three or fewer Epley manoeuvres. Within current clinical practice, a different diagnosis is sought if the

patient fails to respond to the Epley manoeuvre. However, there is no firm evidence and no exact figure within the current literature indicating how many Epley manoeuvres should be attempted prior to considering an alternative diagnosis. Based on our data, we argue that further investigation is required if there is no symptomatic improvement following three Epley manoeuvres, as BPPV is unlikely to be the underlying cause in such cases.

Several other conditions mimic BPPV symptoms, especially migraine. Therefore, if there is no clinical response to the Epley manoeuvre, the responsible clinician should question the diagnosis. Prompt and accurate diagnosis of the disease is essential for successful management of BPPV. The information presented in this paper is important for clinicians, as it demonstrates the range in the number of Epley manoeuvres required for symptomatic relief. If the responsible clinician is aware of the common symptoms post Epley manoeuvre, it will prompt them to seek an alternative diagnosis if the patient repeatedly fails to respond to treatment.

- **Benign paroxysmal positional vertigo (BPPV) is a common reason for referral to ENT clinics**
- **Uncontrolled BPPV can adversely affect patients' quality of life**
- **The Epley manoeuvre is a safe and effective treatment option for BPPV**
- **Forty-seven per cent of patients achieved symptomatic control following one Epley manoeuvre**
- **Eighty-four per cent of patients were asymptomatic following three or fewer Epley manoeuvres**
- **An alternative diagnosis should be sought if there is no clinical response following three Epley manoeuvres**

Symptomatic control of BPPV is possible following one Epley manoeuvre. Prompt identification and treatment of BPPV within the initial audiology appointment enables quick discharge from the service, thus releasing appointments and medical resources. Patients who did not attend the initial follow-up appointment were content and presumably asymptomatic. Hypothetically, these patients would have been discharged following the initial follow-up visit.

## Conclusion

When explaining the treatment options to BPPV patients, clinicians should highlight the fact that symptomatic control can be achieved in 47 per cent of patients following one Epley manoeuvre. However, if symptoms persist, this does not reflect a failure of treatment, rather it demonstrates the need for further

follow-up appointments. Through clear communication, and a structured and organised follow-up procedure, this debilitating condition can be managed effectively. Eighty-four per cent of patients (59 out of 70) were successfully treated with three or fewer Epley manoeuvres.

#### References

- 1 von Brevern M, Radtke A, Lezius F, Feldmann M, Ziese T, Lempert T *et al.* Epidemiology of benign paroxysmal positional vertigo: a population based study. *J Neurol Neurosurg Psychiatry* 2007;**78**:710–15
- 2 Xiang-Dong G. Benign paroxysmal positional vertigo. *J Neurosci Rural Pract* 2011;**2**:109–10
- 3 Gámiz MJ, Lopez-Escamez JA. Health-related quality of life in patients over sixty years old with benign paroxysmal positional vertigo. *Gerontology* 2004;**50**:82–6
- 4 Gordon CR, Zur O, Furas R, Kott E, Gadoth N. Pitfalls in the diagnosis of benign paroxysmal positional vertigo [in Hebrew]. *Harefuah* 2000;**38**:1024–7
- 5 Helminski JO, Zee DS, Janssen I, Hain CT. Effectiveness of particle repositioning maneuvers in the treatment of benign paroxysmal positional vertigo: a systematic review. *Phys Ther* 2010;**90**:663–78
- 6 Hilton MP, Pinder DK. The Epley (canalith repositioning) manoeuvre for benign paroxysmal positional vertigo. *Cochrane Database Syst Rev* 2004;(2):CD003162
- 7 National Institute for Health and Care Excellence. Benign paroxysmal positional vertigo. In: <http://cks.nice.org.uk/benign-paroxysmal-positional-vertigo#!topicsummary> [3 February 2015]
- 8 Prokopakis EP, Chimona T, Tsagournisakis M, Christodoulou P, Hirsch BE, Lachanas VA *et al.* Benign paroxysmal positional vertigo: 10-year experience in treating 592 patients with canalith repositioning procedure. *Laryngoscope* 2005;**115**:1667–71
- 9 Bruintjes TD, Companjen J, van der Zaag-Loonen HJ, van Benthem PP. A randomised sham-controlled trial to assess the long-term effect of the Epley manoeuvre for treatment of posterior canal benign paroxysmal positional vertigo. *Clin Otolaryngol* 2014;**39**:39–44

#### Address for correspondence:

Dr D Hughes,  
Vice Chancellor's Residence,  
University of Wales Trinity St Davids,  
College Road,  
Carmarthen SA31 3EP,  
Wales, UK

Fax: 01978 727402

E-mail: [hughesdaniel32@yahoo.com](mailto:hughesdaniel32@yahoo.com)

---

Dr D Hughes takes responsibility for the integrity  
of the content of the paper  
Competing interests: None declared

---