



Original Article

Probable Benign Paroxysmal Positional Vertigo Converts into Definite BPPV in One in Six Patients

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OBJECTIVE: Patients with positional vertigo who have a positive Dix–Hallpike (DH) test are diagnosed as having definite benign paroxysmal positional vertigo (BPPV), and those who have a negative DH test as having probable BPPV. Little is known about the course of the disease in the latter group. The aim of the present study was to assess how many patients with probable BPPV convert into having a positive DH test during follow-up.

MATERIALS and METHODS: We included new patients who had experienced typical positional vertigo within the past 4 weeks and had a negative DH test. Patients were followed up over a period of 8 weeks. If the symptoms re-occurred, they were invited to return to the clinic for diagnostic DH test and, if positive, treated with a canalith repositioning maneuver.

RESULTS: During the inclusion period of 18 months, 167 patients had probable BPPV, in which 43 fulfilled the inclusion criteria. The mean age of the patients was 57 (SD 14.5) years. Of the patients, 27 (63%) were females. During follow-up, 25 (58%) patients suffered from recurring positional vertigo, in which 13 underwent the DH test. Of the 13 patients, 8 were positive in 7 (16%) patients; 1 patient had a positive DH test twice.

CONCLUSION: Among patients with a history of BPPV but a negative DH test at the first consultation, more than half (58%) experienced positional vertigo within 8 weeks. In 1 of 6 patients, the diagnosis was changed from probable to definite BPPV. Our advice to professionals who are confronted with a patient with symptoms of BPPV, but with a negative DH test, is to adopt a policy of low-threshold access for patients with recurring symptoms.

KEYWORDS: Dizziness, vertigo, benign paroxysmal positional vertigo

INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is a condition characterized by brief episodes of vertigo evoked by changes in the position of the head. In the elderly, it is a cause of falls that can result in fractures and has an impact on the patient's quality of life (QoL)^[1-4]. Its prevalence increases with age^[5]. Therefore, it is important to identify and, if objectified, to treat patients with BPPV because of its debilitating effect on the QoL and its associated risk of falling, especially in the elderly^[1,2].

In our multidisciplinary dizziness unit where patients are offered a one-stop visit approach, approximately one-fifth of the patients are diagnosed with BPPV. The diagnosis is established if there is a combination of typical symptoms with a positive Dix–Hallpike (DH) test, which is a maneuver that provokes both typical vertigo and torsional–vertical nystagmus and is diagnostic for the presence of canaliths in the posterior semicircular canal. Approximately half of our patients with typical positional vertigo have definite BPPV. These patients can be easily treated using the Epley maneuver, resolving vertigo complaints in 80%–90% of the patients^[6].

However, in the other half of the patients, the DH test is negative, meaning that during DH positioning either vertigo or nystagmus does not recur. In that case, the diagnosis is based solely on the patient's history of temporary, isolated episodes of positional vertigo with characteristic triggers (bending, turning, or rolling in bed). This type of BPPV is classified as probable BPPV^[7]. Since there is no positive DH test, treatment to convert the DH cannot be applied, and the patient is sent home with an advice to return in case of recurring symptoms. Unfortunately, little can be said to these patients about the risk that they will experience a recurrent episode of positional vertigo that can be treated.

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A pilot study among a small sample of our patients with probable BPPV at a tertiary center revealed that more than half of them had recurring complaints of positional dizziness with a positive DH test within 1 year after their visit to our clinic. The aim of the present study was to follow-up a large group of patients with “probable BPPV” and to perform the DH test at the recurrence of symptoms and, if positive, offer treatment with using the Epley maneuver.

MATERIALS and METHODS

Patients who visited the multidisciplinary outpatient dizziness clinic between August 2014 and March 2016 and who reported to having experienced paroxysmal positional vertigo in accordance with the diagnostic criteria within the past 4 weeks were assessed with the diagnostic DH maneuver [7]. If this test was positive, they were diagnosed with “definite BPPV” and treated with the Epley maneuver [8]. If the DH test was negative, we performed a supine roll test to rule

out lateral canal BPPV. We ruled out vestibular migraine and central pathology as the cause of positional vertigo through patient history and clinical examination. If no other diagnosis could explain the symptoms, the diagnosis was established as “probable BPPV.”

Eligible patients were explained about the purpose of the study and were asked to participate. Possible risk factors for BPPV, such as (head) trauma in the past, hypertension, migraine, Meniere’s disease, diabetes, osteoporosis, and a cerebrovascular attack in the past, were extracted from the medical records [7].

The study consisted of a phone call by the research nurse after 1 and 2 months. If the patient experienced typical vertigo attacks in between the visit and between the phone calls, he or she was advised to contact the clinic and return for diagnostics and treatment if necessary. On the phone, the patient was asked whether typical positional vertigo attacks had re-occurred. If the patient affirmed and was bothered by the symptoms, he was invited to return to the hospital for a diagnostic DH test and, if positive, treated with the therapeutic Epley maneuver.

The institutional review board considered the present study as an observational study; therefore, approval by a medical ethical committee was waived, and written informed consent from the patients was not required. We informed the patients of the goal of the present study, both orally as in written, during their visit.

Statistical Analysis

Descriptive statistics were reported. Demographic characteristics of patients with “definite BPPV” were compared with those of the “probables” using the Student’s t-test for a continuous parametric variable (age), the Mann–Whitney U test for the non-parametric variable (duration of symptoms), and the Fisher’s exact test for the nominal variable (gender). Statistical analyses were performed using the Statistical Package for the Social Sciences software, version 23.0 (IBM Corp.; Armonk, NY, USA). A p<0.05 was considered as statistically significant.

RESULTS

During the study, 2283 new patients with dizziness visited our outpatient clinic, among whom 342 (15%) had definite BPPV, and 167 (7.3%) were diagnosed as having “probable BPPV.” Of these patients, 43 (26%) were eligible for the present study because they had experienced the symptoms within 4 weeks prior to their visit, and because they consented to participate in the study.

The included patients were between 26 and 81 years old. The mean age of the patients was 57 (SD 14.5) years. Of the patients, 27 (63%) were females. They had experienced positional vertigo for a median of 2.8 years (Table 1). None of the patients had positional vertigo at the time of the visit. With regard to risk factors for BPPV, 42% had experienced (head) trauma in the past, 30% had hypertension, 28% suffered from migraine, 7% had Meniere’s disease, 7% had diabetes, 5% had osteoporosis, and 2% (1 patient) had experienced a cerebrovascular attack in the past.

Within 4 weeks after inclusion in the study, 22 patients had recurring positional vertigo, in which 6 patients considered this to be disabling enough to return to the clinic for a DH test; 4 were BPPV positive (Figure 1). At the first follow-up phone call at 4 weeks, none of the patients had positional vertigo. Between 4 and 8 weeks after inclusion,

Table 1. Baseline characteristics of the patients

	Included patients (n=43)
Age in years, mean (SD)	57 (14.5)
Female, n (%)	27 (63%)
Time since the first episode of vertigo median (min–max)	2.8 years (4 weeks–34.9 years)
Possible risk factors for BPPV, n (%) (multiple risk factors per patient)	
Head trauma in the past	18 (42%)
Hypertension	13 (30%)
Migraine	12 (28%)
Meniere’s disease	3 (7%)
Diabetes	3 (7%)
Osteoporosis	2 (5%)
Cerebrovascular attack in the past	1 (2%)

SD: standard deviation

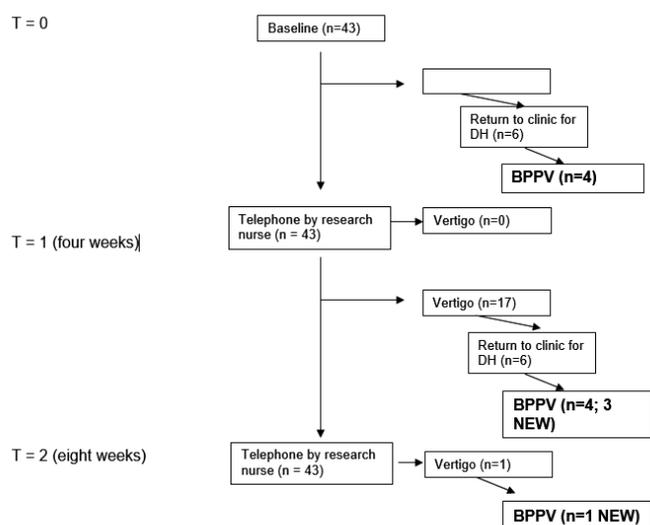


Figure 1. Flow chart of follow up of included patients (n=43).

17 patients (among whom 14 had also experienced vertigo in the previous period and 3 new patients) actively contacted the research nurse, among whom 6 underwent the DH test; 4 had a positive DH test, among whom 1 had also been positive in the previous diagnostic round. At the second follow-up phone call at 8 weeks after inclusion, 1 patient had positional dizziness; he was tested positive by the DH test.

In summary, of the 43 patients with probable BPPV, 25 (58%) patients had re-occurring symptoms of positional vertigo during 8 weeks of follow-up, among whom 13 DH tests were performed; 8 tests were positive in 7 (16%) patients; 1 patient had a positive DH test twice. These seven patients were on average 50 years old (SD 12.8), while the patients with probable BPPV were on average 58 years old (SD 14.6; $p=0.19$). Most were female ($n=6$, 86% vs. 58%; $p=0.35$), and they had suffered from positional vertigo for a median of 3.4 years (compared with 2.5 years for the probable group; $p=0.51$).

DISCUSSION

The present study shows that among patients with probable BPPV, more than half (58%) have recurring complaints of positional vertigo within 8 weeks, which can be objectified as definite BPPV in 16%. By advising patients to actively contact the clinic in case of recurring symptoms, BPPV could be confirmed and treated. It would be interesting to compare the course of the symptoms of the patients with "probable BPPV" with that of the patients with "definite BPPV" for a longer follow-up period. Our advice to professionals who are confronted with a patient with symptoms of BPPV, but with a negative DH test, is to adopt a policy of low-threshold access for patients with recurring symptoms.

The present study has some limitations. First, we included only those patients who had experienced symptoms within the past 4 weeks, resulting in only one-quarter of the total probable BPPV population. This may have been too strict and could have limited the generalizability of our findings to the broader population of patients with probable BPPV. If we had included all patients with probable BPPV, our "conversion" rate could have been higher, but it may also be hypothesized that the rate would decrease because these patients could have a more "silent" form of probable BPPV that would have resolved by itself. Since there is little scientific information about this phenomenon, a new study including all patients with probable BPPV is needed.

The second limitation of our study is the relatively brief follow-up period of 8 weeks. Our results motivate us to adopt a clinical policy to advise all patients with probable BPPV to contact us in case symptoms re-occur. We will register how many develop positive BPPV during a longer follow-up to assess whether the time frame is of influence on the conversion rate.

The third limitation of our study is that the diagnosis of probable BPPV is one of exclusion, not of affirmation. A central cause of vertigo is possible. However, as Bronstein and Lempert stated that "...a history of recurrences and remissions over years is a strong argument in favor of BPPV and against a central lesion"^[9].

In summary, we show that 1 in 6 patients with "probable BPPV" convert into "definite BPPV" within 8 weeks. Physicians confronted with a patient with typical positional vertigo but with a negative DH test should advise the patient to return in case of recurring symptoms,

and they should be treated with the Epley maneuver if the DH test is positive. Further research should clarify whether expanding the other settings and whether incorporating a longer follow-up period result in higher conversion rates.

CONCLUSION

Among patients with probable BPPV, more than half have recurring complaints of positional vertigo within 8 weeks, which can be objectified as definite BPPV in 16%. We advise professionals to adopt a policy of low-threshold access for patients with recurring symptoms when confronted with a patient with symptoms of BPPV but with a negative DH test.

Ethics Committee Approval: Ethics committee approval was received for this study from Gelre ziekenhuizen Institutional Review Board.

Informed Consent: Verbal informed consent was obtained from patient who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – H.v.d.Z., T.B., R.v.L.; Design - H.v.d.Z., T.B., R.v.L.; Supervision - H.v.d.Z., T.B., R.v.L.; Resource - H.v.d.Z., T.B., R.v.L.; Materials - H.v.d.Z., T.B., R.v.L.; Data Collection and/or Processing - H.v.d.Z., T.B., R.v.L.; Analysis and/or Interpretation - H.v.d.Z., T.B., R.v.L.; Literature Search - H.v.d.Z., T.B., R.v.L.; Writing - H.v.d.Z.; Critical Reviews - H.v.d.Z., T.B., R.v.L.

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