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Publication date:
2021

Document Version
Publisher's PDF, also known as Version of record

In patients diagnosed with posterior BPPV, how effective are different BPPV-repositioning maneuvers when complete resolution of symptoms is required?

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Background

Benign Paroxysmal Positional Vertigo (BPPV) is the most frequent cause of vertigo in adults. There are three main types of BPPV: posterior, horizontal and anterior, with posterior BPPV (P-BPPV) accounting for approximately 80% of all BPPV cases. BPPV is characterized by short episodes of vertigo after positional changes such as turning the head, lying down and getting up. The standard test used for diagnostics of P-BPPV is the Dix-Hallpike (DH)-test. Today the most frequently used treatment for P-BPPV is the Epley maneuver. However, other repositioning manevers exist. It is still not clear which repositioning maneuver is the most efficient for treatment of P-BPPV when complete resolution of vertiginous symptoms is required.

Objectives

To systematically review the literature and thereby identify and compare the effectiveness of different P-BPPV repositioning maneuvers. Effectiveness was measured by total resolution of symptoms after one treatment with a maximum of four weeks follow-up. Treatment with manual repositioning maneuvers (RMs) are easy for healthcare professionals to perform and can potentially cure the patients after only one treatment with a success rate from 32% to 90%. The comparison of RMs is poorly examined in which that have the greatest effect. Therefore, this review aims to investigate whether the Epley maneuver should continue to be first choice of treatment or if other maneuvers could be equal or even superior to this.

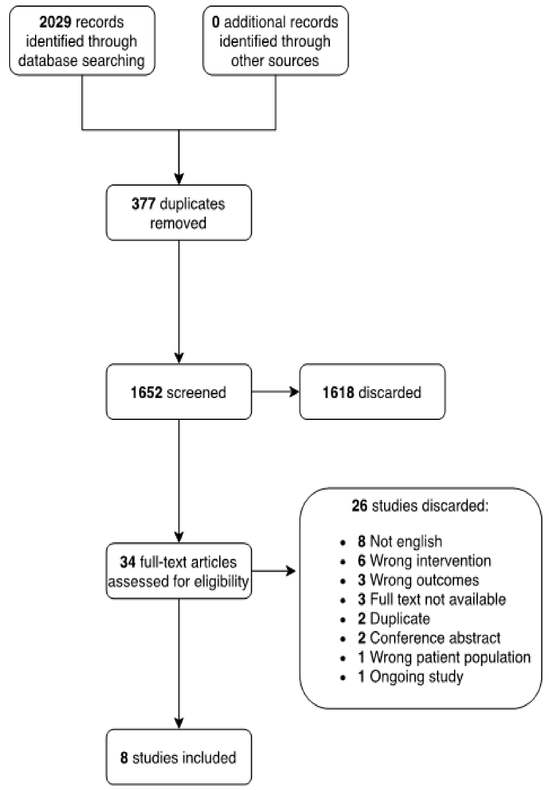

Figure 1. Trial Profile

Methods

Study design: PubMed, Embase and Cochrane library were searched to identify randomized controlled trials and systematic reviews.
Data collection and synthesis: study selection was carried out by two reviewers. Cochrane risk of bias tool was used for assessment of methodological quality and results were evaluated according to the GRADE method. Outcomes were analysed in RevMan (5.4) andreported in relative risk (RR). Statistically heterogeneity was quantified using I^2 statistics.
Outcomes: the main outcome is complete resolution of vertiginous symptoms. Secondary outcomes include cervical- and back pain, post treatment dizziness and nausea, conversion of a positive DH-test to a negative DH-test.

Results

Eight studies were selected including a total 595 patients. Four maneuvers were identified; the Epley-, Semont-, Gans- and Li-maneuvers. Based upon GRADE assessment, the quality of the results was graded low or very low.
Primary outcomes: six studies reported dichotomous outcome. No difference was found between the RMs looking at total remission of vertigo. The Epley- compared to the Semont maneuver: RR 1.21 [95% CI 0.81, 1.81, p=0.35]. The Epley- compared to the Li maneuver: RR 0.95 [95% CI 0.71, 1.28, p=0,76]. The Epley- compared to the Gans maneuver was significant after 24 hours: RR 1.44 [95% CI 1.04, 2.00, p=0.03]. However, no significant difference was seen after one week : RR 1.50 [95% CI 0.96, 2.35, p=0.08]. Two studies reported continuous outcome. No difference between the RMs was found.

Author	Repositioning maneuver	Average gender and age ratio M/F	Symptom duration	Follow-up
Cohen et al. 1999	Epley vs Semont	57.2 years, N/A	34.93 days	7 days
Cohen et al. 2005	Epley vs Semont	N/A, N/A	N/A	7 days
Karanjai et al. 2005	Epley vs Semont	41 years, 20/28	N/A	14 days
Badawy et al. 2015	Epley vs Gans	42 years, 20/10	17.75 days	7 days
Li et al. 2017	Epley vs Li	52.1 years, 20.5/36	7.75 days	3 days
Saberi et al. 2017	Epley vs Gans	46.75 years, 7.5/27.5	N/A	1 day and 7 days
Lee et al. 2014	Epley vs Semont	57.1 years, 9/27	4.5 days	End of treatment
Mazoor et al. 2011	Epley vs Semont	46.2 years, 12.5/17.5	N/A	30 days

Table 1. Studies included in review.

Conclusion

Based on a low to very low certainty of evidence, there is an indication that the Epley maneuver is equal to the Semont, Gans and Li maneuvers in terms of resolution of vertiginous symptoms in patients diagnosed with P-BPPV. Although the Epley maneuver is superior to the Gans maneuver 24 hours after treatment, this is not the case after one week of follow up. With conversion of a positive DH test to a negative DH test, a statistically significant difference in favour of the Epley maneuver was seen compared to the Semont- and Gans maneuvers, but after one week no significant difference was found with Gans maneuver. However, high quality studies are still needed to determine the effectiveness of individual maneuvers. The studies included in this review have a high risk of bias looking at the quality assessment. Furthermore, modifications of the maneuvers as well as imprecise and diverse reporting of outcomes made comparison of intervention groups difficult.

Figure 2. BPPV repositional maneuvers included in study. Left **Epley Maneuver**, *upper left (1a-1d); right* **Semont Maneuver**, *upper right (2a-2c);* right **Gans Maneuver**, *lower left (3a-3d);* left **Li Maneuver**, *lower right (4a-4c).*

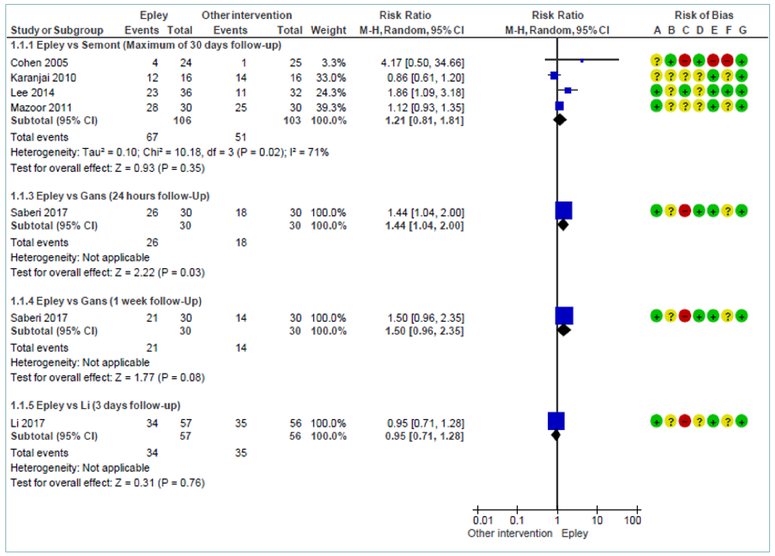

Table 2. Primary outcome with total resolution of positional vertigo.

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Disclosure: No conflicts of interest

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