

The Effectiveness of Epley's Maneuver in the Indian Population with Benign Paroxysmal Positional Vertigo(BPPV): A Literature Review

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Abstract: Benign Paroxysmal Positional Vertigo (BPPV) is a prevalent Vestibular disorder affecting individuals globally, including in India. The Epley maneuver is widely used as a non-invasive treatment for BPPV. This systematic review aims to evaluate the effectiveness of the Epley maneuver in the Indian population by analyzing existing literature, identifying challenges in its implementation, and discussing the need for further research.

Keywords: BPPV, Vertigo, Benign Positional, Epley maneuver, Indian population, Vestibular disorder

Introduction

Vertigo is a widespread vestibular disorder that impacts people worldwide, including in India. Among its various forms, benign paroxysmal positional vertigo (BPPV) is one of the most common, causing brief episodes dizziness due to specific head movements. BPPV is caused by dislodged otoliths within the semicircular canals, leading to abnormal endolymphatic flow and vertiginous sensations. A well-established and non-invasive treatment for BPPV is the Epley maneuver, which has been extensively utilized to alleviate symptoms effectively.¹

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This literature review aims to assess the efficacy of the Epley maneuver specifically within the Indian population, considering cultural, anatomical, and healthcare system factors unique to this demographic.

BPPV arises when calcium carbonate crystals, known as otoconia, become dislodged from the utricle and move into the semicircular canals, with the posterior canal being the most frequently affected. This displacement causes abnormal stimulation of the cupula during head movements, leading to vertigo and nystagmus. The posterior semicircular canal's anatomical orientation makes it particularly susceptible to otolithic deposition.^{1,2}

Patients with BPPV typically report transient episodes of vertigo lasting less than a minute, precipitated by changes in head position such as lying down, turning over in bed, or looking upward. Associated symptoms may include nausea, vomiting, and imbalance. The Dix-Hallpike maneuver is a diagnostic test used to elicit characteristic nystagmus and confirm the diagnosis of posterior canal BPPV.³

The Epley maneuver is designed to relocate dislodged otoconia from the posterior semicircular canal back to the utricle, thereby alleviating vertiginous symptoms. The maneuver involves a series of head and body movements performed in a specific sequence.^{2,3}

The patient sits upright with the head turned 45 degrees toward the affected ear. In Dix-Hallpike Position the patient is quickly laid back into a supine position with the head extended 30 degrees below horizontal, maintaining the 45-degree head turn. After 1-2 minutes, the head is turned 90 degrees toward the opposite side, so the unaffected ear faces downward. The patient rolls onto the shoulder of the unaffected side, turning the head another 90 degrees downward. Finally, the patient is brought back to an upright sitting position. Each position is maintained for approximately 1-2 minutes to allow gravitational forces to move the otoconia through the canal system.

Mechanism of Action of maneuver utilizes gravity to guide the free-floating otoconia through the semicircular canal and into the utricle, where they can

be reabsorbed or settle without causing vertigo. By systematically repositioning the head, the Epley maneuver aims to clear the canal of debris, restoring normal vestibular function.

Review of Literature and Discussion

A systematic search was conducted using Google Scholar to identify studies published in the last 15 years related to the Epley maneuver in the Indian population with benign paroxysmal positional vertigo (BPPV). The search was performed using the keywords Epley's maneuver, India studies, BPPV. The initial search yielded approximately 2,235 studies. Duplicates, common searches, and studies irrelevant to the topic were excluded. Additionally, studies where the Epley maneuver was combined with medical therapy were removed. Several studies have examined the efficacy of the Epley maneuver in treating BPPV within the Indian population.

1. A retrospective study conducted by Das et al. (2017)⁴ in a tertiary care center in Sikkim, India, found that benign paroxysmal positional vertigo was the most commonly diagnosed cause of dizziness, accounting for over 50% of the cases. This highlights the significant burden of this condition within the Indian healthcare system. The Epley maneuver, a non-invasive repositioning technique, has emerged as a widely used and well-documented approach to address BPPV.
2. Kavathia et al. (2020)⁵ compared the effectiveness of Epley's maneuver versus medical therapy alone in treating Benign Paroxysmal Positional Vertigo (BPPV). Their study found that patients who underwent Epley's maneuver experienced faster symptom relief and better overall outcomes compared to those receiving only medical therapy. The results reinforced the superiority of canalith repositioning maneuvers in BPPV management, highlighting Epley's maneuver as a first-line treatment for quicker and more effective symptom resolution.
3. Josna (2023)⁶ conducted a prospective analytical study evaluating the effectiveness of Epley's maneuver alone, without any medication,

in treating posterior canal BPPV. The study found that Epley's maneuver was highly effective in resolving symptoms without the need for additional drug therapy. This supports the idea that canalith repositioning alone is sufficient for managing posterior canal BPPV, reducing dependency on medications and their potential side effects.

4. Singh et al. (2023)⁷ conducted a comparative effectiveness study to evaluate Epley's maneuver alone versus Epley's maneuver combined with Betahistine therapy in treating posterior canal BPPV. The results showed that while Epley's maneuver alone was effective in resolving symptoms, the addition of Betahistine provided faster symptom relief and improved patient comfort, particularly in reducing residual dizziness. The study suggested that while Epley's maneuver remains the primary treatment, Betahistine can be a useful add-on therapy for enhancing recovery and minimizing post-maneuver symptoms.
5. Thakur et al. (2024)⁸ conducted a randomized clinical trial comparing the recovery rates of the Epley's maneuver versus the Semont maneuver in patients with posterior canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that while both maneuvers were effective in relieving symptoms, the modified Epley's maneuver showed a higher success rate and faster symptom resolution compared to the Semont maneuver.
6. Gupta et al. (2022)⁹ investigated the association between Benign Paroxysmal Positional Vertigo (BPPV) and migraine in the Indian population. Their study found a significant correlation, suggesting that individuals with migraines had a higher likelihood of experiencing BPPV. The research highlighted possible shared pathophysiological mechanisms, such as vestibular hypersensitivity and vascular dysfunction. Epley's maneuver would help in decreasing dizziness episodes.
7. Gaur et al. (2015)¹⁰ conducted a prospective observational study to assess the efficacy of Epley's maneuver in treating Benign Paroxysmal Positional Vertigo (BPPV). The study found that Epley's maneuver was highly effective, with a majority of patients experiencing significant symptom relief after a single session, while

some required multiple sessions for complete recovery. The results further established Epley's maneuver as a primary treatment option, emphasizing its non-invasive approach and high success rate in managing BPPV

8. Yadav et al. (2024)¹¹ conducted a pre-and post-treatment analysis to assess the impact of Epley's maneuver on quality of life in patients with posterior semicircular canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that Epley's maneuver significantly improved patients' quality of life, reducing dizziness-related disability, anxiety, and limitations in daily activities.
9. Sharma et al. (2023)¹² conducted a prospective observational study to evaluate the effectiveness of Epley's maneuver in treating posterior canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that Epley's maneuver was highly effective, with most patients experiencing significant symptom relief after a single session, while a few required multiple sessions. The findings affirmed Epley's maneuver as a primary treatment for posterior canal BPPV, emphasizing its high success rate, non-invasive nature, and ability to provide rapid symptom resolution
10. Joshi et al. (2021)¹³ proposed a randomized controlled trial protocol comparing the Epley maneuver and the Gans repositioning maneuver in treating posterior canal Benign Paroxysmal Positional Vertigo (BPPV). The study aimed to evaluate which maneuver provides better symptom resolution and long-term effectiveness.
11. Kumar et al. (2024)¹⁴ conducted a comparative study to evaluate whether the use of the Dizzy-Fix training device enhances the effectiveness of the Epley maneuver in treating Benign Paroxysmal Positional Vertigo (BPPV). The study found that patients using the Dizzy-Fix device alongside the Epley maneuver experienced faster symptom resolution and better long-term outcomes compared to those who underwent the maneuver alone. The results suggest that the Dizzy-Fix device can improve patient compliance and accuracy in performing the maneuver, potentially reducing recurrence rates and enhancing overall treatment success.

12. Srivastava et al. (2024)¹⁵ conducted a study to assess quality of life improvement in patients with posterior canal Benign Paroxysmal Positional Vertigo (BPPV) using videonystagmography (VNG)-guided Epley's maneuver. The study found that VNG-guided Epley's maneuver led to better symptom resolution, reduced recurrence rates, and greater patient satisfaction compared to traditional methods. The findings suggest that VNG enhances the precision and effectiveness of Epley's maneuver, leading to improved treatment outcomes and a significant boost in patients' quality of life.
13. Sundararajan et al. (2011)¹⁶ conducted a prospective, randomized study comparing Epley's maneuver alone versus Epley's maneuver combined with a labyrinthine sedative in managing Benign Paroxysmal Positional Vertigo (BPPV). The study found that while Epley's maneuver alone was highly effective, the addition of a labyrinthine sedative did not significantly improve outcomes and, in some cases, led to prolonged recovery due to sedation-related side effects. The findings support Epley's maneuver as the primary treatment for BPPV, with medication use being unnecessary in most cases.
14. Gupta and Solanki (2022)¹⁷ conducted a study to evaluate the effectiveness of Epley's maneuver as the sole treatment for posterior semicircular canal Benign Paroxysmal Positional Vertigo (BPPV). Their findings confirmed that Epley's maneuver was highly effective in resolving symptoms, with most patients experiencing significant relief after a single session, and only a few requiring multiple maneuvers. The study reinforced Epley's maneuver as the primary and standalone treatment for posterior canal BPPV.
15. Sachdeva and Sao (2020)¹⁸ conducted a hospital-based study to assess the clinical response time of Epley's maneuver in treating Benign Paroxysmal Positional Vertigo (BPPV). The study found that most patients experienced significant symptom relief within a few minutes to hours after the maneuver, while some required repeated sessions for complete resolution. The findings highlighted Epley's maneuver as a rapid and effective treatment for BPPV.

16. Keerthana et al. (2021)¹⁹ conducted a cohort study comparing the effectiveness of Epley's maneuver versus Semont's maneuver in treating posterior semicircular canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that both maneuvers were effective, but Epley's maneuver had a higher success rate and faster symptom resolution compared to Semont's maneuver. The findings suggest that Epley's maneuver should be the preferred first-line treatment for posterior canal BPPV, while Semont's maneuver remains a viable alternative, especially for patients who have difficulty tolerating positional changes required in Epley's maneuver.
17. Acharya et al. (2020)²⁰ conducted a comparative study evaluating the effectiveness of Epley's maneuver versus Semont's maneuver in treating Benign Paroxysmal Positional Vertigo (BPPV) in a tertiary care hospital. The study found that both maneuvers were effective in symptom resolution, but Epley's maneuver demonstrated a higher success rate and quicker symptom relief compared to Semont's maneuver.
18. Mishra et al. (2023)²¹ conducted a comparative study to evaluate the effectiveness of Epley's maneuver versus Semont's maneuver in treating posterior canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that both maneuvers were effective in resolving vertigo symptoms, but Epley's maneuver had a higher success rate and faster symptom resolution compared to Semont's maneuver. The findings suggest that Epley's maneuver should be the first-line treatment for posterior canal BPPV, while Semont's maneuver remains a viable alternative, particularly for patients who struggle with certain positional movements required in the Epley maneuver.
19. Venkatramanan et al. (2023)²² conducted a study comparing the efficacy of Epley's maneuver and Semont's maneuver using videonystagmography (VNG) in patients with posterior canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that both maneuvers were effective, but Epley's maneuver showed a higher success rate and faster symptom resolution compared to Semont's

maneuver. VNG provided better accuracy in diagnosing and monitoring treatment progress, confirming that Epley's maneuver remains the preferred treatment, while Semont's maneuver is a viable alternative for certain patients.

20. Singh et al. (2023)²³ conducted a study to evaluate the efficacy of Epley's maneuver in treating posterior semicircular canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that Epley's maneuver was highly effective, with the majority of patients experiencing significant symptom relief after a single session, while some required multiple sessions for complete resolution. The findings reinforce Epley's maneuver as the gold-standard treatment for posterior canal BPPV, highlighting its high success rate, non-invasiveness, and ability to provide rapid symptom relief.
21. Nadagoud et al. (2024)²⁴ conducted a comparative study to evaluate the efficacy of Epley's, Semont's, and Gans' maneuvers in treating posterior canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that Epley's maneuver had the highest success rate and fastest symptom resolution, followed by Semont's maneuver, while Gans' maneuver was the least effective but still provided symptom relief.
22. Gupta et al. (2023)²⁵ conducted a prospective study to assess the efficacy of Epley's maneuver in enhancing the quality of life of patients with subjective Benign Paroxysmal Positional Vertigo (BPPV). The study found that Epley's maneuver significantly improved patients quality of life by reducing dizziness, enhancing daily functioning, and lowering anxiety related to vertigo episodes.
23. Santhraya et al. (2021)²⁶ conducted a comparative study evaluating the effectiveness of Semont's and Epley's maneuvers, both with and without Betahistine therapy, in treating posterior semicircular canal Benign Paroxysmal Positional Vertigo (BPPV). The study found that Epley's maneuver was more effective than Semont's maneuver in resolving vertigo symptoms. Additionally, the addition of Betahistine therapy improved symptom relief and reduced residual dizziness in both groups.

24. Pavithralochani et al. (2019)²⁷ conducted a study comparing the efficacy of Epley's maneuver versus Brandt-Daroff exercises in treating patients with vertigo, particularly Benign Paroxysmal Positional Vertigo (BPPV). The study found that Epley's maneuver was significantly more effective in providing rapid symptom relief, with most patients experiencing immediate or faster resolution of vertigo. In contrast, Brandt-Daroff exercises were beneficial but required a longer duration for symptom improvement. The findings suggest that Epley's maneuver should be the first-line treatment for BPPV, while Brandt-Daroff exercises may be useful as a secondary option, especially for home-based management or recurrence prevention.
25. Srinivasan et al.²⁸ conducted a study evaluating the effectiveness of Epley's maneuver in improving the quality of life in patients with posterior canal Benign Paroxysmal Positional Vertigo (BPPV) following head injury. The study found that Epley's maneuver was highly effective in reducing vertigo symptoms and associated dizziness, leading to significant improvements in daily functioning and overall quality of life. The findings highlight that post-traumatic BPPV responds well to Epley's maneuver, reinforcing its role as a first-line treatment even in cases where vertigo is caused by head injury.
26. Kaur and Shamanna (2017)²⁹ conducted a comparative study to evaluate the effectiveness of Epley's maneuver versus Betahistine therapy in the management of BPPV. The study found that Epley's maneuver provided faster and more effective symptom resolution compared to Betahistine alone. While Betahistine helped in reducing dizziness and improving patient comfort, it was less effective as a standalone treatment. The findings suggest that Epley's maneuver should be the primary treatment for BPPV, with Betahistine as a supportive therapy for symptom relief and recurrence prevention.

Conclusion

The Epley maneuver is a viable, cost-effective treatment for BPPV. It can be performed in an outpatient setting with minimal training, making it accessible to a wide range of healthcare providers. Given the high prevalence of BPPV, a diagnosis can often be established through patient complaints and the Dix-Hallpike maneuver. This literature review suggests that the Epley maneuver has a distinct advantage over other treatment modalities, such as pharmacotherapy and alternative repositioning maneuvers. However, to maximize its effectiveness in India, improvements in training programs for healthcare professionals, and standardized clinical guidelines are necessary.

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