



ASSESSMENT OF DURATION ON BENIGN PAROXYSMAL POSTURAL VERTIGO(BPPV) USING CANALITH REPOSITIONING MANEUVER AND HABITUAL EXERCISES - A RANDOMIZED CONTROLLED TRIAL.

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ABSTRACT

Introduction- Benign paroxysmal positional vertigo (BPPV) is “a balance disorder that results in the sudden onset of dizziness, spinning, or vertigo when moving the head”. The usual treatment is to perform the repositioning maneuvers; however, additional postural instabilities are not addressed in this approach. Thus, the purpose of vestibular rehabilitation (VR) includes of vestibular habituation and postural control exercises, such as training and improvement of the static and dynamic balance thereby allows the individual to perform well in functional activities and in addition to eliminating symptoms and generating a better quality of life. **Methodology-** A randomised controlled trial was conducted for 8 weeks between two groups. Control group was given vestibular habitual exercises and experimental group was given canalith repositioning maneuver. The sample size taken was 10 and ethical permission was taken. The tools used were Tinetti Performance Oriented Mobility Assessment, Dynamic Gait Index scale, Dizziness Handicap Inventory , Vestibular Activities of Daily Living. **Conclusion-** The present study demonstrated that canalith repositioning maneuver in combination to vestibular habitual exercises increased the benefit of treatment in BPPV patients in improving symptoms and reducing the time required to obtain a satisfactory result. In addition, it allows patients to return to their occupation sooner and improves their quality of life.

KEYWORDS : BPPV-Canalith repositioning maneuver-Vestibular Rehabilitation

INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is “a balance disorder that results in the sudden onset of dizziness, spinning, or vertigo when moving the head”¹

Benign paroxysmal positional vertigo (BPPV) is a disorder of inner ear where aberrant signals from semi-circular canals create an illusion of motion which results in vertigo. The otoliths detach from the utricle and move within the lumen of one of the semi-circular canals and cause endolymph movement that stimulates the ampulla of the affected canal, thereby causing repeated episodes of vertigo. Typically, a patient with BPPV complains of brief episodes of vertigo which is provoked by positional changes of the head with respect to gravity .BPPV is triggered by lying down, rolling over in bed, bending over, and looking up or lateral head tilts toward the affected ear.^{2,3}

The vertigo attack lasts only 30 seconds to 2 minutes (usually less than 1 minute) and disappears even if the precipitating position is maintained. Complaints associated with BPPV are postural instability that may last for hours or days after the episodic vertigo has stopped, dizziness, as well as more vague sensations, such as light headedness and a feeling of floating. Symptoms can range in severity from mild dizziness to debilitating episodes that may induce nausea/ vomiting & significantly hinder daily functioning.⁴

First-line therapy for BPPV is organized around repositioning maneuvers. For posterior canal BPPV, the maneuver developed by Epley is particularly effective.⁵

The usual treatment is to perform the repositioning maneuvers; however, additional postural instabilities are not addressed in this approach. Thus, the purpose of vestibular rehabilitation (VR) includes of vestibular habituation and postural control exercises, such as training and improvement of the static and dynamic balance.^{6,7,8} This allows the individual to perform well in functional activities and to improve the persistent imbalance after BPPV treatment, in addition to eliminating symptoms and generating a better quality of life.

AIM

To study the duration required for vestibular habituation with canalith repositioning maneuver and habitual exercises only on postural instability and activities of daily living independence in Benign Paroxysmal Positional Vertigo.

OBJECTIVES

PRIMARY OBJECTIVE –

- To assess the duration required for habituation of symptoms in BPPV patients with habituation exercises only.

- To assess the duration required for habituation of symptoms in BPPV patients with habituation exercises and canalith repositioning maneuver.
- To compare the duration required for habituation of symptoms in BPPV patients using habitual exercises only versus canalith repositioning maneuver with habitual exercises.

SECONDARY OBJECTIVE -

- To assess the severity of positional vertigo after intervention .
- To assess the effect of above intervention on activities of daily living independence after intervention .

METHODOLOGY

- STUDY DESIGN** – A randomized controlled study
- STUDY SETTINGS**-The study program had been conducted in Occupational Therapy Department at tertiary hospital on OPD basis for 2 months [2 times per week].

The patient had been screened with POMA [Tinetti] assessment of gait and balance to rule out patients with high risk of fall on 1st day.

- STUDY DURATION**- 8 weeks
- SAMPLE SIZE** = 10
- ETHICAL CONSIDERATIONS** – The study protocol, informed consent document, case report form were reviewed and approved by an institutional ethics committee.

- STUDY TOOLS**-tinetti Performance Oriented Mobility Assessment(POMA) Dynamic Gait Index scale(DGI) Dizziness Handicap Inventory (DHI) Vestibular Activities of Daily Living (VADL)

STUDY PROTOCOL

Habitual Exercise
Gaze exercises
Balance exercises
Proprioceptive sensory inputs with altered visual inputs
Dual task activities
Functional activities

- Experimental exercise
Canalith repositioning maneuver

Group 1 = Control group[Habitual exercises]

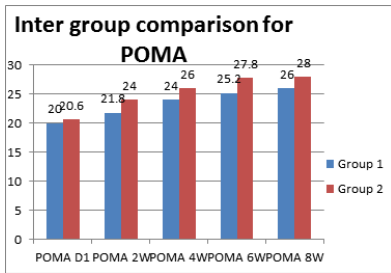
Group 2 = Experimental group[Habitual exercises & Canalith repositioning maneuver]

RESULT

Statistical procedures

- Data was subjected to statistical analysis using Statistical package for social sciences (SPSS v 26.0, IBM).
- Since the scales were graded & sample size was less, hence non-parametric tests have been used for comparisons.
- Inter group comparison (2 groups) was done using Mann Whitney U test.
- Intra group comparison was done using Friedman's (for >2 observations) followed by pair wise comparison using Wilcoxon Signed rank test.
- 2W= 2nd week
- 4W= 4th week
- 6W= 6th week
- 8W= 8th week
- Eg- POMA 2W – POMA D1 is POMA 2nd week – POMA Day 1

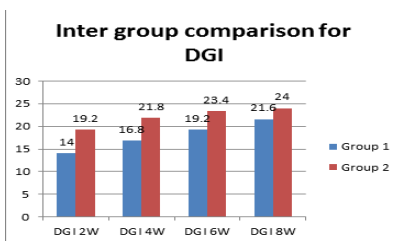
1. tinetti Performance Oriented Mobility Assessment (POMA)



Graph-1

There was a statistically significant difference seen at 4th week & shows statistically highly significant difference seen at 6th & 8th week.

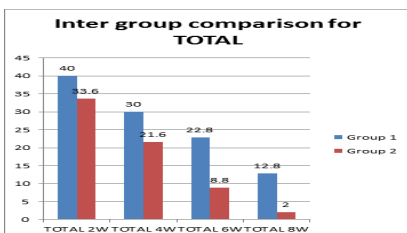
2. Dynamic Gait Index scale[DGI]



Graph-2

There was statistically significant difference seen at 2nd week & statistically highly significant difference seen from 4th week.

3. Dizziness Handicap Inventory (DHI)



Graph-3

There was statistically highly significant difference at 6th week

DISCUSSION

POMA & Dynamic Gait Index scale[DGI]

In both scales intra group showed that there was a statistically highly significant difference seen in both groups.

For POMA scale the inter group showed there was a statistically significant difference at 4th week & showed statistically highly significant difference at 6th & 8th week.(ref to graph no-1

For DGI scale the inter group showed there was statistically significant difference at 2nd week & statistically highly significant difference seen from 4th week. (ref to graph no-2)

In the study done by Kavita et.al, supports that the patients in experimental group received canalith repositioning maneuver provided high efficiency with long lasting control of symptoms in patient with BPPV.⁹

The study by Gaur et, al supported that canalith repositioning maneuver was effective in preventing the re – occurrence& reducing vertigo & response to Dix hallpix test from positive to negative¹⁰.

It showed in the study done by Wen –Chang et.al the vestibular habitual exercise training emphasized on functional activities which under stimulating vestibular function shows greater improvement for their functional gait performance.¹¹

This combine intervention of canalith repositioning maneuver & vestibular habitual exercises (protocol for experimental group) showed statistically highly significant difference, thereby contributing to early improvement in balance (during difference task demands) & reducing the risk of falls.

Dizziness Handicap Inventory (DHI)scale

For DHI functional domain the intra group comparison showed there was a statistically significant difference in control group & statistically highly significant difference in experimental group and inter group comparison showed statistically highly significant difference at 8th week.

For DHI emotional domain the intra group showed there was statistically highly significant difference from 2nd week in control group and statistically significant difference in experimental group and inter group comparison showed statistically significant difference from 2nd week.

For DHI physical domain the intra group comparison showed there was statistically highly significant difference in both groups and for inter group comparison there was statistically significant difference at 6th and 8th week.

For DHI total the intra group showed there was statistically highly significant difference in both groups and inter group comparison showed there was statistically highly significant difference from 6th week(ref to graph no-3)

M.E. Norre et. al¹² supported that repeated presentation of the pattern of activities allows the evolution of compensation by aprocess of habituation. Therefore, in spite of having mild residuals symptoms patient might have performed functionally well.

The study done by Daniele Rodrigues et. al supported that with vestibular rehabilitation (VR) exercises through neuroplasticity it is possible to adjust or supply the corrupted or absent sensory information resulting from the present alteration in vestibular labyrinth with an aimat the functional recovery of the body balance & improvement in functioning of vestibular organ.¹³

The study shows done by Karyna Myrelly et.al that vestibular rehabilitation is described as effective in decreasing dizziness & improving functional independence.¹⁴

In recent study done by Kavita Sachdeva et.al there was improvement found in dizziness handicap scores after canalith repositioning maneuver.⁹

Vestibular Activities of Daily Living (VADL)

For VADL functional and ambulatory domain the intra group comparison showed statistically highly significant difference in both groups and for instrumental domain there was statistically significant difference in control group and statistically highly significant difference in experimental group.

For inter group comparison for functional, ambulatory and instrumental domain there was statistically non- significant difference between both the groups.

In VADL scale inter group comparison between groups showed mean difference in values between control and experimental group with lower score in experimental group which signifies some improvement in experimental group during each week & was reflected clinically too, but due to variations found in standard deviation & sample size being small, the results did not reflect any statistically significant difference

on p value. The other possible reason could be that the vestibular habitual exercises which was given to both the groups which had a habitual effect on the patients.

As it is explained by M.E. Norre et al. that repeated presentation of this new pattern allows the evolution of compensation by a process of habituation¹².

In this study both the groups i.e. control & experimental groups showed significant improvement in balance, severity in dizziness and functional activity.

In experimental group in which Vestibular habitual exercises with additional canalith repositioning maneuver was given which showed early recovery. Thus, study findings support all alternative hypothesis and reject null hypothesis.

The study was supported by trial done by Figueiredo et al.¹⁴ according to them, the intervention should include: (1) canalith repositioning therapy to flush the dislodged otolithic debris back into the utricle; and (2) balance retraining therapy to enhance central compensation, improve balance and eliminate residual dizziness.

CONCLUSION

The present study demonstrated that canalith repositioning maneuver in combination to vestibular habitual exercises increased the benefit of treatment in BPPV patients in improving symptoms and reducing the time required to obtain a satisfactory result. In addition, it allows patients to return to their occupation sooner and improves their quality of life.

LIMITATIONS

The main limitation of this study is small sample size. Another limitation is our results only measure the short-term treatment effects of the given training. Long-term follow-up studies will be needed to determine the long-term effects of maneuver and exercise training.

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