

## Evaluation of the Role of Epley's Manoeuvre in the Treatment of Benign Paroxysmal Positional Vertigo Without Nystagmus

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### ABSTRACT:

#### BACKGROUND:

Epley's manoeuvre can give satisfactory and long lasting relief of symptoms in patients with typical history of benign paroxysmal positional vertigo without nystagmus in Dix-Hallpike positional test.

#### OBJECTIVE:

To evaluate the effectiveness of Epley's manoeuvre in those patients with typical history of benign paroxysmal positional vertigo without nystagmus in Dix-Hallpike positional test.

#### MATERIAL AND METHOD:

Ninety six patients with benign paroxysmal positional vertigo (37 of them males and 59 females). With Dix-Hallpike positional test 58 patients had nystagmus (objective benign paroxysmal positional vertigo) and 38 patients had no nystagmus (subjective benign paroxysmal positional vertigo), was carried out comparison of Epley's manoeuvre in both groups.

#### RESULTS:

There was significant improvement of symptoms (87%) by Epley's manoeuvre in patients who had benign paroxysmal positional vertigo without nystagmus.

#### CONCLUSION:

Epley's manoeuvre can give good result in relieving of vertigo in patients with typical history of benign paroxysmal positional vertigo even if no nystagmus can be detected in Dix-Hallpike test.

**KEYWORDS:** benign paroxysmal positional vertigo (BPPV), posterior semicircular canal (PSCC).

### INTRODUCTION:

Dizziness or giddiness is a common term used by the vestibular patients to describe their problems (which may be disequilibrium, vertigo or lightheadedness)<sup>(1)</sup>. Vertigo is the illusion of motion; it may be due to peripheral or central disorders. The most common peripheral vestibular disorder generally is agreed to be BPPV. The hallmark of the disease is brief spells (lasting seconds) of often severe vertigo that are experienced after specific movements of the head. The head movements that most commonly cause symptoms are rolling over in bed and extreme posterior extension of the head as if looking under a sink. Current understanding of this disease has evolved such that specific therapies based on accepted theories have been developed and proved successful in controlling symptoms<sup>(2)</sup>.

Two main theories are widely accepted now as an explanation behind the occurrence of Benign

Paroxysmal Positional vertigo, cupulolithiasis and canalolithiasis theories. According to the cupulolithiasis theory, vertigo is caused by the utricular stimulation of the cupula of the semicircular canal by calcium carbonate crystals detached from the macula utriculi that come to rest on the cupula during certain movements of the head. Conversely, the canalolithiasis theory interprets vertigo as due to the deflexion of the crista ampullaris caused by the endolymphatic current induced by the movement of abnormal ear dust debris and cell derivatives in the canal itself<sup>(3,4)</sup>.

The otoconial debris in BPPV would naturally tend to fall in to posterior semicircular canal and therefore BPPV of posterior semicircular canal is the most common variant of BPPV, less in the lateral and anterior (superior) SCC. Rarely affect more than one canal or bilateral<sup>(2)</sup>.

Dix-Hallpike positional test is used for diagnosis of BPPV, which is going with nystagmus and fairly intensive acute vertigo for 20-30 seconds.

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However, apparently there is another more latent more chronic variant, when the patient has typical BPPV symptom (short vertigo when bending forward, lying down, sitting up or turning over in bed) but no nystagmus (only vertigo) is evoked by Dix-Hallpike and supine roll maneuvers, this is called (subjective BPPV)<sup>(5)</sup>.

Proposed theories to explain the lack of nystagmus in patients with BPPV during the Dix-Hallpike test include the following: subtle nystagmus missed by the observer, fatigued nystagmus from repeated testing before the manoeuvre and a less noxious form BPPV that elicits vertigo but with an inadequate neural signal to stimulate the vestibulo-ocular pathway<sup>(6)</sup>.

Another explanation that the patients could have minimum calcium carbonate particles stuck to the cupula or fluctuating in the affected semicircular canal, enough to cause nausea and/or vertigo but not enough to cause nystagmus<sup>(7)</sup>.

The use of videonystagmography (VNG) enables the proper identification of the positioning nystagmus, allowing the pinpointing of the semicircular canal involved in BPPV. The VNG rules out the inhibitory effect of the eye fixation on the vertical and horizontal nystagmus this happens because the rotational nystagmus is not inhibited by eye fixation.

Epley maneuver are commonly used for the treatment of posterior canal BPPV, other modalities are Semont maneuver, Brandt - Daroff exercise or vestibular rehabilitation therapy<sup>(8)</sup>.

The Epley's maneuver begins with placement of the head into the Dix-Hallpike position, to evoke vertigo. The posterior canal on the affected side is in the earth-vertical plane with the head in this position. After the initial nystagmus subsides, a 180-degree roll of the head (in two 90-degree increments, stopping in each position until any nystagmus resolves) to the position in which the offending ear is up (i.e., the nose is pointed at a 45-degree angle toward the ground in this position) is performed. The patient is then brought to the sitting upright position<sup>(2)</sup>

The differential diagnosis of BPPV should include central pathologies, migraine, cervical vertigo (vertigo on turning to the side but no

vertigo on Dix-Hallpike test)<sup>(4)</sup>, chronic subjective dizziness (anxiety related)<sup>(9)</sup>

#### **MATERIAL AND METHODS:**

Ninety-seven patients with positional vertigo were examined in the vertigo clinic in the Audiology Centre /Medical City (Baghdad, Iraq) from November 2015 to March 2017. In this comparative study history was taken from these patients in addition to ENT and neurological examination this includes Dix-Hallpike test guided by infrared goggles and videonystagmography (VNG) also supine roll manoeuvre (for horizontal canal) the patients should stop any antivertiginous drug 72 hours before examination.

In Dix-Hallpike test, onset of vertical-rotatory geotropic nystagmus with few seconds latency, duration of less than 2 minutes has considered of posterior semicircular canal (PSCC) BPPV. Subjective type BPPV (sBPPV) was diagnosed when a subjective symptomatology similar to that of typical BPPV was noted without concomitant nystagmus during or after Dix-Hallpike test guided by infrared goggles.

For diagnosis of lateral semicircular canal (LSCC) BPPV Roll test was performed. The patient lied supine with the head elevated for 30 degree, the head then rolled to one side then to central position then to opposite side then again to central position. LSCC BPPV was diagnosed when horizontal nystagmus with short latency, geotropic more intense in affected side.

Management of PSCC BPPV (objective +subjective) was done using Epley's manoeuvre (after detection of the side affected by Dix-Hallpike test) then instruction is given to the patient to repeat the manoeuvre at home 2-3 times /day until the vertigo disappears (without antivertiginous drug). The second visit is after 2 weeks and the third visit after 4 weeks, for patients who did not respond to Epley's manoeuvre after 3<sup>rd</sup> visit other modality of treatment are used.

#### **RESULT:**

Ninety six patients diagnosed as having PSCC BPPV were included in our study; only one patient diagnosed as having LSCC BPPV (was excluded from our study as our study is to evaluate the Epley's manoeuvre for treatment of PSCC BPPV). No patient was diagnosed as having anterior (superior) semicircular canal BPPV (table 1).

**Table 1: The semicircular canal affected by BPPV.**

|                    | PSCC BPPV | LSCC BPPV | ASCC BPPV | Total |
|--------------------|-----------|-----------|-----------|-------|
| Number of patients | 96        | 1         | 0         | 97    |

These 96 patients (37 of them males, 59 females) mean age is 48.2 years(table 2). Fifty eight patients diagnosed as having PSCC BPPV with nystagmus (objective BPPV) by Dix-Hallpike

test, 38 patient diagnosed with PSCC BPPV without nystagmus (subjective BPPV) they only had vertigo on Dix-Hallpike test but without nystagmus (table 3).

**Table 2: Gender and age distribution in our patients.**

| Number of patients | Male | Female | Mean Age |
|--------------------|------|--------|----------|
| 96                 | 37   | 59     | 48.2     |

**Table 3: The results of Dix-Hallpike test in patients complaining of positional vertigo.**

|                    | PSCC BPPV | s BPPV | o BPPV |
|--------------------|-----------|--------|--------|
| Number of patients | 96        | 38     | 58     |

Table 4+5 show the result of management of objective and subjective PSCC BPPV respectively. In the first 2 weeks there is improvement of 51 patients (88%) of objective BPPV 26(69%) of the subjective BPPV. While after 4 weeks there was improvement of 57

(98%) and 33(87%) patients from the objective and the subjective group respectively. Only 1(2%) patient from the objective and 5(13%) patients from subjective group did not respond to Epley s manoeuvr and needs other modality of treatment.

**Table 4: Management outcome of PCS objective BPPV.**

| Total number | Cured in 1 <sup>st</sup> 2weeks | Cured in 2 <sup>nd</sup> 2weeks | Total number cured | Need another modality |
|--------------|---------------------------------|---------------------------------|--------------------|-----------------------|
| 58           | 51(88%)                         | 6(10%)                          | 57(98%)            | 1(2%)                 |

**Table 5: Management outcome of PCS subjective BPPV.**

| Total number | Cured in 1st 2weeks | Cured in 2 <sup>nd</sup> 2weeks | Total number cured | Need another modality |
|--------------|---------------------|---------------------------------|--------------------|-----------------------|
| 38           | 26(69%)             | 7(10%)                          | 33(87%)            | 5(13%)                |

## DISCUSSION:

Although Epley s manoeuvr are becoming widely accepted as a managing tool for objective BPPV, we can say the same about using Epley s manoeuvr in the management of subjective BPPV. Haynes and colleagues, Tirelli and colleagues and Wider and colleagues found that patients with subjective BPPV who were treated with various repositioning manoeuvr had response rate of 76-93% overall <sup>(6,7,10)</sup>.

In our study 97 patients (one had horizontal semicircular canal BPPV and excluded from study) other 96 patients had PSCC BPPV, 38 patients met the criteria of diagnosis of subjective BPPV of posterior semicircular canal (PSCC sBPPV) were treated with Epley's manoeuvr. Other 58 patients with objective BPPV of posterior semicircular canal were also treated with Epley's manoeuvr. The response to Epley s manoeuvr in posterior semicircular canal

subjective BPPV (PSCC sBPPV) is 69% in the 1<sup>st</sup> 2 weeks this raised to 88% after 2<sup>nd</sup> 2 weeks. This usually goes with result of above study.

Hunt et al, found that Epley' s manoeuvr is effective for eliminating BPPV in more than 80% of cases <sup>(10)</sup>.

Hughes et al reported only 47% cure rate the first time it is applied (Epley's manoeuvr) but this was raised to 84% after the 3<sup>rd</sup> manoeuvr applied <sup>(12)</sup>.

In our study we did the 1<sup>st</sup> Epley's manoeuvr in the vertigo clinic and gave instruction to the patients to repeat the manoeuvr at home until the vertigo disappear and also get the benefit from see the manoeuvr at the internet. We found that the patients can do well with this method. So in patients with PSCC oBPPV we found Epley's manoeuvr successful in 88% after 1<sup>st</sup> 2weeks and this is raised to 98% in 2<sup>nd</sup> 2 weeks. Only one

patient did not respond to Epley's manoeuvre and shifted to other modality of treatment. Follow up of patients for one year show no recurrent of disease in PCSS oBPPV and only one patient in PSCC sBPPV had recurrence of symptoms. However longer follow up is needed. The results of this research assume that Epley's manoeuvre which is used for the treatment of BPPV even if not observe a detectable nystagmus.

#### CONCLUSION:

Symptoms of vertigo and positional test (typical history of BPPV) are sufficient to get satisfactory outcome by Epley's manoeuvre even if no nystagmus can be detected.

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