

CLINICAL EVALUATION OF POSITIONAL VERTIGO

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ABSTRACT

BACKGROUND

Vertigo is a very common symptom with which patients see a doctor in clinical practice. It is defined as "subjective sense of imbalance". Vertigo can be broadly classified into Subjective and Objective types. Each can be again divided into episodic lasting for seconds or hours and prolonged lasting for weeks. A common presenting form of vertigo is that which is experienced when the patient turns his head in a particular position i.e. the positional vertigo, in some cases the vertiginous symptoms are also accompanied by a positional nystagmus. Benign Paroxysmal Positional Vertigo (BPPV) is one the most common causes of vertigo. In the present study 100 patients were evaluated for Positional Vertigo.

The aim of the study is to analyse patients presenting with positional vertigo and to evaluate the Effectiveness of Epley's manoeuvre in BPPV and Medical management in patients with negative Dix Hallpike's Positional test.

MATERIALS AND METHODS

The study included 100 consecutive patients diagnosed with positional vertigo. A detailed history and general examination and ENT examination was done including vestibular function evaluation. X-Ray cervical spine, P T A and caloric test (cold) were done. CT scan and MRI performed. Positional test positive patients were treated with Epley's manoeuvre and results analysed.

RESULTS

100 patients with positional vertigo and among them 70 with BPPV were included in the present study. The mean age of the patient's was 42.34±4.6 years. 30% of the patients belonged to the age group of 51 to 60 years, 25% to the age group of 41 to 50 years, and 20% to the age group of 31 to 40 years. 70/100 patients were treated with Epley's manoeuvre. The response to Epley's manoeuvre in the study showed that 65 patients were symptom free after 2 weeks, 67 after 1 month and 69 after 3 to 6 months period.

CONCLUSION

BPPV is one of the major causes of Positional Vertigo and that it could be very effectively treated using Epley's manoeuvre. Labyrinthine Sedatives, Vasodilators and Neurotropic vitamins have some role in controlling symptoms in patients with Positional Vertigo.

KEYWORDS

Vertigo, Positional Vertigo, Epley Manoeuvre, BPPV, Nystagmus, Labyrinthine Sedatives.

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BACKGROUND

The original description of Benign Paroxysmal Positional Vertigo has been variously attributed to Barany, Adler, Nylen and others.¹ Barany was the first to describe the condition in detail and Dix and Hallpike were the first to clearly describe both the currently used provocative positioning techniques and the essential clinical manifestations of Benign Paroxysmal Positional Vertigo elicited by that technique. BPPV is caused by loose statoconia from the

utricle which in certain positions of the head is free to respond to gravitational forces and thereby to displace the cupola of the posterior canal.¹ In positional test, the posterior canal ampulla of the under most ear is brought into a position superior to the utricle. In 1969, Schuknecht proposed the cupulolithiasis theory according to which BPPV is caused by deposition of a substance on the cupola of the posterior semicircular canal.² In 1973, Schuknecht and Ruby reported finding copular deposits in 37% of the temporal bone specimens from 245 patients without gross pathological changes in the labyrinth. 58% of these were located in the posterior canal. Schuknecht, recognizing the benign nature of BPPV noted that the most rational and most simple management of the disorder is avoidance of the provocative position.³ In 1974, Gacek pioneered selective sectioning of the posterior ampullary nerve (Singular neurectomy).⁴ An alternative physical therapy was reported by Brandt and Daroff in 1980 to promote the loosening and ultimate dispersion of the degenerated otolithic material

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from the cupola.⁵ Cawthorne proposed his “vestibular habituation therapy” which consists of having the patient assume head positions that provoked the symptoms of vertigo with a goal of increasing their tolerance rather than eliminating the cause.⁶ Brandt and Daroff devised a specific treatment for BPPV with a goal of dispersing debris within the posterior semicircular canal. In this exercise the patient repeatedly went from the sitting to the supine position on the symptomatic side, to the supine position on the opposite side. The exercises were repeated three times a day. Successful outcome was reported in many cases.⁷ Toupet and Semont described the first single treatment specifically designed to address the posterior semicircular canal. In this the symptoms were initially provoked in the Hallpike position. After a brief period the patient was quickly brought to the sitting position and is immediately placed face down on the opposite side. In this way the debris in the posterior semicircular canal was “walked” out of the long arm of the canal back into the utricle. The success with this procedure ranges between 50 and 90 percent.⁸ Epley proposed another manoeuvre. After the Hallpike manoeuvre is performed, the patient is left in the sitting position for ten minutes to allow the particles to accumulate in the most dependent position of the posterior canal. The head is extended over the edge of the table with the affected ear down and the vertex of the head pointed towards the floor at approximately 30 degrees. The head is then rotated 180 degrees from the starting position now with the opposite ear down and the head again pointed towards the floor. The particles now move towards the common crus. Next the patient is turned slowly towards that side until the patient is in a full face down position. After a few minutes the patient is slowly returned to a sitting position.⁹ The Modified Epley’s Procedure differs from the original Epley’s procedure in the following ways: The patient performs it by himself/herself. Head reclinatio

n is achieved by supporting the patient’s shoulder with a pillow. The head is resting on the bed instead of the free head-hanging position. Head vibration is not used. Patients are not advised to stay upright for 48 hours after successful treatment because this precaution has proven unnecessary. This manoeuvre should be performed three times a day and is repeated daily until the patient is free from positional vertigo for 24 hours.¹⁰ A number of surgical procedures have also been proposed for the treatment of BPPV. Transaction of the posterior ampullary nerve (singular neurectomy) was proposed by Gacek in 1974.¹¹ Recently, posterior occlusion of the semicircular canal has become the surgical procedure of choice. Anterior and horizontal canal variants of BPPV: Apparently because of their anatomical position within the labyrinth, debris is less likely to enter the anterior or horizontal semicircular canals, though there is convincing evidence that both variants exist. Anterior canal BPPV patients show a torsional downbeat nystagmus on Dix-Hallpike test.¹²

MATERIALS AND METHODS

The present study was conducted in the Department of E.N.T, Government Medical College Hospital, Kozhikode with complaints of positional vertigo during the period from May 20013–October 20014. The study included 100 consecutive patients diagnosed with positional vertigo. A detailed history and general examination of the patients was done, followed by E.N.T examination including clinical tests for vestibular function evaluation. All the systems were examined with the cardiovascular and nervous system in detail. Baseline investigations, X-Ray cervical spine, P T A and caloric test (cold) were done for all. CT scan and MRI were done in patients according to the requirement of diagnosis. Patients with a positive Dix Hallpike test were treated with particle repositioning manoeuvre. Patients were reviewed at the intervals of two weeks, one month, three months and six months. Meanwhile they were asked to report to our Out Patient Department, if symptoms recurred or exaggerated. A written consent was obtained from all the patients. An Institutional Ethical committee clearance was obtained before the study commenced. All the data was analysed using standard statistical methods.

OBSERVATIONS AND RESULTS

The present study was conducted in the Department of ENT of Government teaching Hospital attached to Government Medical College, Kozhikode. The study period was between May 20013 and October 20014. The Total number of patients attending the General Hospital during that period were 3, 67,329 and among them attending the ENT department were 89,856. Patients with complaint of vertigo were 576. From among these 576 patients 100 patients with positional vertigo and among them 70 with BPPV were included in the present study. The patients belonged to the age group of 11 to 80 years with a mean age of 42.34±4.6 years. 30% of the patients belonged to the age group of 51 to 60 years, 25% to the age group of 41 to 50 years, 20% to the age group of 31 to 40 years and 18% belonged to the age group of 21 to 30 years (Table 1), (Figure 1).

		Number	Percent
Age in Years	0-10	0	0
	11-20	2	2
	21-30	18	18
	31-40	20	20
	41-50	25	25
	51-60	30	30
	61-70	3	3
	71-80	2	2
Total		100	100

Table 1. Showing the Age Distribution of the Study Group (n=100)

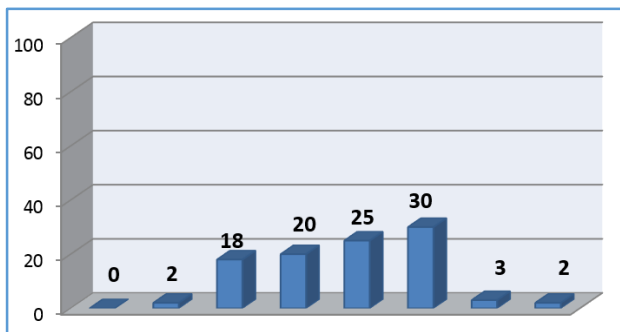


Figure 1. Showing the Bar chart of Percentage Distribution of Age (n=100)

Among the 100 patients of this study 64 were females and 36 were male patients (Table 2), (Figure 2).

		Number	Percent
Sex	Male	36	36
	Female	64	64
Total		100	100

Table 2. Showing the Gender Distribution of the Study Group (n=100)

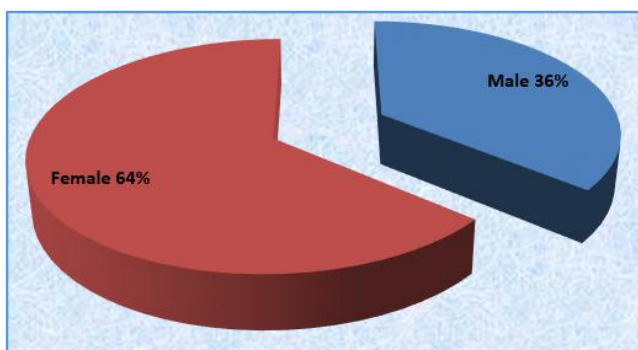


Figure 2. Showing the Pie Chart of Percentage Distribution of Gender (n=100)

Among the 100 patients 58 were unemployed and 42 were employed (Table 3).

		Number	Percent
Occupation	Employed	42	42
	Unemployed	58	58
Total		100	100

Table 3. Showing the Distribution of Occupation in the Study Group (n=100)

Among the 100 patients 17 had hearing loss and 83 patients had normal hearing (Table 4).

		Number	Percent
Hearing	Normal	83	83
	Abnormal	17	17
Total		100	100

Table 4. Showing the Incidence of Hearing Loss in the Study Group (n=100)

There was no history of tinnitus in 90 patients and 10 patients gave history of tinnitus in this study (Table 5).

		Number	Percent
Tinnitus	Present	10	10
	Absent	90	90
Total		100	100

Table 5. Showing the Incidence of Tinnitus in the Study Group (n=100)

18 patients complained of aural fullness during history taking while the remaining 82 patients did not complain of aural fullness (Table 6).

		Number	Percent
Fullness in the ear	Present	18	18
	Absent	82	82
Total		100	100

Table 6. Showing the Incidence of Aural Fullness in the Ear (n=100)

There was history of noise exposure in 9 patients as they were professional slab polishing workers (Table 7).

		Number	Percent
Noise Exposure	Present	9	9
	Absent	91	91
Total		100	100

Table 7. Showing the Incidence of Noise Exposure in the Study Group (n=100)

Previous history of ear discharge was elicited in 12 patients (Table 8).

		Number	Percent
Ear Discharge	Present	12	12
	Absent	88	88
Total		100	100

Table 8. Showing the Incidence of Ear Discharge (n=100)

40 patients among the 100 study group gave history of nausea during the attack of vertigo in them (Table 9).

		Number	Percent
Nausea	Present	40	40
	Absent	60	60
Total		100	100

Table 9. Showing the Incidence of Nausea in the Study Group (n=100)

36 patients gave history of Vomiting during the attack of vertigo in this study (Table 10).

		Number	Percent
Vomiting	Present	36	36
	Absent	64	64
Total		100	100

Table 10. Showing the Incidence of Vomiting (n=100)

History of Head trauma was found in 20 patients in the present study (Table 11).

		Number	Percent
Head Trauma	Present	20	20
	Absent	80	80
Total		100	100

Table 11. Showing the Incidence of Head Trauma (n=100)

The incidence of Neck trauma was found in 18 patients (Table 12).

		Number	Percent
Neck Problem	Present	18	18
	Absent	82	82
Total		100	100

Table 12. Showing the Incidence of Neck Problem (n=100)

History of prolonged use of ototoxic drugs was found in 12 patients (Table 13).

		Number	Percent
Prolonged Medication	Present	12	12
	Absent	88	88
Total		100	100

Table 13. Showing Incidence of Prolonged Medication (Ototoxic Drugs), (n=100).

The incidence of Hypertension in the present study was 24 (Table 14).

		Number	Percent
Hypertension	Present	24	24
	Absent	76	76
Total		100	100

Table 14. Showing the Incidence of Hypertension (> 130/90 mm of Hg), (n=100)

Among the 100 patients 21 had Haemoglobin less than 10 gms/dL (Table 15).

		Number	Percent
Haemoglobin	< 10g %	21	21
	> 10g %	79	79
Total		100	100

Table 15. Showing the incidence of Haemoglobin concentration in the study group (n=100)

Random Blood sugar more than 140 mg% was found in 20 patients (Table 16).

		Number	Percent
RBS	> 140 mg %	20	20
	< 140 mg %	80	80
Total		100	100

Table 16. Showing the Incidence of Random Blood Sugar Level more than 140 mg% (n=100)

Among the 100 patients 22 were showing abnormalities of cervical spine, such as Spondylosis, straightening of the cervical spine (Table 17).

		Number	Percent
X-Ray Cervical Spine	Normal	78	78
	Abnormal	22	22
Total		100	100

Table 17. Showing the Abnormalities of on X-Ray Cervical Spine (n=100)

Abnormal Cold caloric test was observed in 18 patients; 17 showed canal paresis and 1 dead labyrinth (Table 19).

		Number	Percent
Cold Caloric Test	Normal	82	82
	Abnormal	18	18
Total		100	100

Table 19. Showing the Incidence of Abnormal Cold Caloric Test (n=100)

Pure tone audiogram was abnormal in 21 patients; The abnormal hearing included 28.57% patients with onductive hearing loss and 71.43% patients sensorineural hearing loss (Table 20).

		Number	Percent
PTA	Normal	79	79
	Abnormal	21	21
Total		100	100

Table 20. Showing Abnormal PTA (n=100)

Positional test was positive in 70 patients and 30 patients showed negative response (Table 21).

		Number	Percent
Positional Test	Positive	70	70
	Negative	30	30
Total		100	100

Table 21. Showing the Response to Positional Test (n=100)

70/100 patients were treated with Epley's manoeuvre. The response to Epley's manoeuvre in the study showed that 65 patients were symptom free after 2 weeks, 67 after 1 month and 69 after 3 to 6 months period (Table 22).

Procedure Done	Number of Patients Responded	Percent	
Epley's Manoeuvr e	After 2 weeks	65	92.86
	After 1 month	67	95.71
	3 months / 6 months	69	98.57
Total	70	70	

Table 22. Showing the end Result of Epley's Manoeuvre in the Study (70 cases)

30/100 patients were treated with medical treatment including vestibular sedatives. 19 patients responded to the treatment and 11 patients did not show any improvement (Table 23).

		Number	Percent
Labyrinthine Sedative/ vasodilators	Responded	19	63.33
	Not Responded	11	36.67
Total		30	30
Table 23. Showing the Response to Medical treatment (30 cases)			

The response to Neuro vitamins and Antioxidants was also studied and found that out of 11 patients 6 responded to the treatment (Table 24).

		Number	Percent
Neuro vitamins/ Antioxidants	Responded	6	54.45
	Not Responded	5	45.45
Total		11	11
Table 23. Showing the Response to Neuro Vitamins (n=11)			

Following the treatment for 2 weeks all the patients were called for review. Among those who underwent Particle Repositioning Manoeuvre, five showed symptoms of BPPV and Dix Hallpike test was found to be positive. Hence Particle Repositioning Manoeuvre was repeated for them and by second visit i.e., after one month three of them showed recurrence of symptoms and procedure was repeated. On third visit i.e. after one month three of them showed recurrence of symptoms and procedure was repeated. On the third visit i.e. after three months one patient again presented with complains of vertigo and was sent for a neurological evaluation and later lost for follow up. Six persons did not contact us for the last review, but since they were given instructions to report at any time if symptoms occur, we assume that they were symptom free. The non BPPV cases were given Labyrinthine sedatives/Vasodilators and majority got relief with two weeks of therapy. The unresponsive cases were treated with neurotropic vitamins and antioxidants. Five persons not responded for all these measures, one case turned to be Vestibular schwannoma and referred to Neurosurgery Department for further management. Four cases were instructed to take treatment from Orthopaedic Department as they were diagnosed as having cervical Spondylosis.

DISCUSSION

In this study 100 patients presenting with symptoms of positional vertigo were included. Out of these 70 patients were found to have BPPV. 22 patients showed cervical spine abnormalities on x-ray. But there were symptoms like pain and stiffness in only 18 patients. The causes of vertigo could

be attributed to these abnormalities of spine. But 75% of people above 50 years show Osteo- arthritic spine or other degenerative changes in cervical vertebrae, which are not directly related to the Symptomatology (Parnes, Jones and Spillane – 1954).¹³ One patient a male of 50 years had vertigo and unilateral hearing loss. PTA showed left sided profound SNHL and a CT scan was taken which showed CP angle lesion and an MRI scan was taken and a diagnosis of vestibular schwannoma was made and referred to neurosurgery department. Among the 100 patients 20 had history of minor head trauma within one month of the first attack of vertigo. Though trauma is a common cause of BPPV, most of the cases are idiopathic (Baloh, Honrubia, Jacobson, 1987).¹⁴ All the 70 patients diagnosed with BPPV Epley’s manoeuvre was done with a success rate of 92.8% two weeks. Epley’s original study of CRP to treat BPPV demonstrated 97.7% success rate.¹⁵ Subsequently studies by various authors revealed a wide range of reported response rates. In the present study among the five out of 70 BPPV diagnoses, patients who developed recurrence after 2 weeks, a repeat Epley’s manoeuvre was done which led to complete resolution of symptoms in 4 patients during six months follow up. One patient did not responded to treatment and that patient was referred to neurology department and lost for follow up. Parnes and Price – Jones treated 38 patients, 69% exhibited a complete early response, 10% improved and 10% experienced failures and 10% were lost to follow up.¹³ Charles W Cummings et al reported in 25 patients of his study, 44% had a complete early response; 24% improved and 32% had failures.¹⁶ In a randomized prospective trial Lynn et al demonstrated an 89% response rate after one treatment as compared with a 26.7% response rate in a control group.¹⁷ Blakley reported in 16 patients of his study; 44% had complete early response, 50% reported improvement but not complete resolution of symptoms.¹⁸ The natural history of BPPV is incompletely understood. Although spontaneous resolution of symptoms is common it is also clear that some patients have frequent recurrences. Epley reported a 30% recurrence rate after the manoeuvre.¹⁵ Parnes and Price-Jones reported a 17% recurrence rate during a six-month period.¹³ Our patients were advised to remain in head upright position for 48 hours. Epley recommended that patients remain in head upright position for 48 hours after repositioning to prevent loose debris from assuming a dependent position in the posterior semicircular canals. Some have advocated the use of cervical collars. Although use of post procedure instructions to remain upright seems logical, in reality, there is not sufficient data available to determine whether maintaining an upright position after repositioning is effective; how long it is necessary; or whether patients are actually able to comply with these instructions. Difference in the reported success may also be due, in part, to difference in the classification systems used to define success and failure. Many authors have relied primarily on the patient’s self-report of symptoms. Some consider negative Dix Hallpike test as the gold standard of success. But the intensity of nystagmus and vertigo induced by the test may

vary from day to day and can be affected by performance factors such as the speed and plane of head movements during the test. In fact, it is advisable not to rely solely on the results of Dix Hallpike test to define success and failure. Epley defined recurrences solely as renewed symptoms after an asymptomatic month. Our patients were advised to remain in head upright position for 48 hours. They were advised to use cervical collar, if available, just to make them aware of the condition and to avoid sudden head turning for one week. They were reviewed after two weeks. Recurrences were defined based on symptoms as well as a positive Dix Hallpike test.

SUMMARY

The study presented here includes analysis of 100 patients with positional vertigo that attended the Department of E.N.T Medical College Calicut during a one and a half year period from 1st May 2003 to 31st October 2004. The cases were analysed using simple clinical methods. 70% of the positional vertigo was finally diagnosed as BPPV. Particle Repositioning Manoeuvre was found to be effective. There was no control group from the BPPV cases as it was thought to be unethical not to provide a treatment measure which had such a great success rate in literature. The present study showed BPPV was found to be more in middle aged house wives. Among the 100 positional vertigo patients 20 had history of minor head trauma in the recent past and 18 had history of neck pain and cervical spine problems. 30 patients with negative positional test were treated with labyrinthine sedatives and vasodilators; 19 responded. Other 11 cases were treated with neurotropic vitamins and antioxidants; 6 responded. For the rest among non BPPV cases no specific cause could be found for the vertigo. The BPPV patients treated with Particle Repositioning Manoeuvre were reviewed after two weeks and we got a success rate of 92.86%. On repeating the manoeuvre for those with recurrence of the problem the success rate came up to 100%.

CONCLUSION

BPPV is one of the major causes of Positional Vertigo and that it could be very effectively treated using Epley's manoeuvre. Labyrinthine Sedatives, Vasodilators and Neurotropic vitamins have some role in controlling symptoms in patients with Positional Vertigo.

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