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ORIGINAL ARTICLE

Role of vit D in benign paroxysmal positional vertigo

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ABSTRACT:

Background: The most frequent cause of recurrent vertigo among vestibular diseases is benign paroxysmal positional vertigo (BPPV). This study was performed to assess the role of vit D in benign paroxysmal positional vertigo. **Materials &Methods:** 108 patients of paroxysmal positional vertigo of both genders were selected. Serum 25-hydroxyvitamin D (25-OHD) was measured using ELISA method and concentrations less than 20ng/ml was considered deficiency. Patients were divided into 3 groups. Group I received was treatment group (with serum 25-OHD deficiency) who received Epley maneuver + supplemental vitamin D) and group II was non- treatment group who received Epley maneuver therapy alone. A controlgroup (group III) was also taken. **Results:** Group I comprised of 19 males and 17 females, group II had 16 males and 20 females and group III had 18 males and 18 females. The mean vitamin D level at baseline, 3 months and 9 months in group I was 11.9 mg/ml, 33.1 mg/ml and 36.4 mg/ml respectively. In group II was 10.3 mg/ml, 10.7 mg/ml and 11.8 mg/ml. In group III was 34.5 mg/ml, 35.8 mg/ml and 37.3 mg/ml respectively. The difference was significant (P< 0.05). The intensity of BPPV decreased in group I, increased in group II and decreased in group III over 3 months and 9 months period. The difference was significant (P< 0.05). **Conclusion:** Rehabilitative therapy benefits from the restoration of vitamin D insufficiency in BPPV in terms of improved duration.

Keywords: benign paroxysmalpositional vertigo, diabetes, vitamin D

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INTRODUCTION

The most frequent cause of recurrent vertigo among vestibular diseases is benign paroxysmal positional vertigo (BPPV). Patients' sudden onset of benign paroxysmal positional vertigo is a major cause for concern.[1] About 10% of the population is affected by it. It is more prevalent in people over sixty. One of the main theories about the pathophysiology of BPPV is the dislodgement of calcium carbonate crystals from the utricle into the semicircular canals.[2] The density and matrix of calcium carbonate crystals may be impacted by vitamin D's significant involvement in calcium metabolism.[3]

In 2013, the connection between vitamin D and BPPV was initially reported. Since then, a number of studies conducted worldwide have found that patients with BPPV are more likely than the general population to be vitamin D deficient.[4] Low solar exposure brought on by vertigo-induced immobility could be one reason for this. There have previously been studies on the positive impact of vitamin D therapy on muscle strength.[5] For elderly individuals who have imbalance and vertigo, improving postural balance is a crucial part of treatment. Serum vitamin D restoration increases lower limb muscle strength and is anticipated to enhance fall and balance.[6]This study was performed to assess the role of vit D in benign paroxysmal positional vertigo.

MATERIALS &METHODS

This study comprised of108 patients of paroxysmal positional vertigo of both genders. Patients' consent was obtained before starting the study.

Data such as name, age, gender etc. was recorded. Laboratory testing and a comprehensive clinical examination were conducted. Patients' BPPV intensity was measured and reported as a VAS score (0–10), where 0 denoted no vertigo and 10 denoted severe episodes. ELISA was used to quantify serum 25-hydroxyvitamin D (25-OHD), and amounts below 20 ng/ml were deemed deficient. There were two groups of patients. Group II was a non-treatment group that received Epley maneuver therapy alone, while Group I was a treatment group (with serum 25-OHD insufficiency) that received Epley maneuver with supplemented vitamin D. Group III, the control group, was also included. For a month, Epley's approach of rehabilitation was used once a week to all patients. For three months, 50.000 IU of vitamin D were given weekly, andthen 50.000 IU monthly over the 9 months.The results were compiled and subjected for statistical analysis. P value less than 0.05 was set significant.

RESULTS

Table I Distribution of patients

Groups	Group I (treatment)	Group II (non- treatment)	Group III(control)
M:F	19:17	16:20	18:18

Table I shows that group I comprised of 19 males and 17 females, group II had 16 males and 20 females and group III had 18 males and 18 females.

Table II Vit D level at baseline, 3 months and 9 months

Groups	Baseline	3 months	9 months	P value
Group I	11.9	33.1	36.4	0.05
Group II	10.3	10.7	11.8	0.05
Group III	34.5	35.8	37.3	0.21

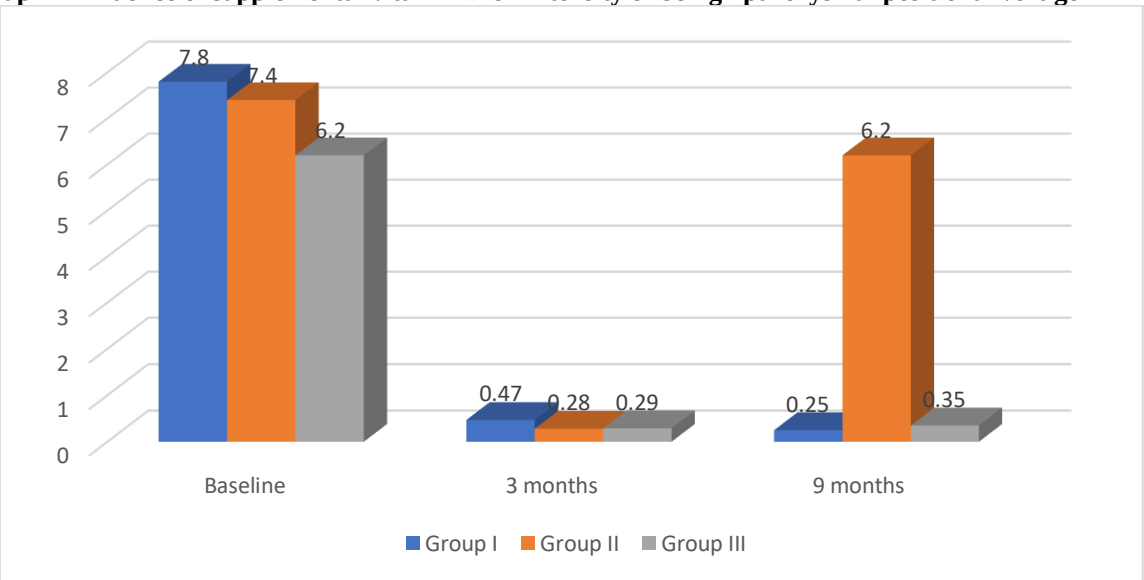
Table II shows that the mean vitamin D level at baseline, 3 months and 9 months in group I was 11.9mg/ml, 33.1 mg/ml and 36.4mg/ml respectively. In group II was 10.3mg/ml, 10.7mg/ml and 11.8mg/ml. In group III was 34.5 mg/ml, 35.8 mg/ml and 37.3mg/ml respectively. The difference was significant (P< 0.05).

Table III Influence of supplemental vitamin D on intensity of benign paroxysmal positional vertigo

Groups	Baseline	3 months	9 months	P value
Group I	7.8	0.47	0.25	0.03
Group II	7.4	0.28	6.2	0.04
Group III	6.2	0.29	0.35	0.05

Table III, graph I shows that the intensity of BPPV decreased in group I, increased in group II and decreased in group III over 3 months and 9 months period. The difference was significant (P< 0.05).

Graph I Influence of supplemental vitamin D on intensity of benign paroxysmal positional vertigo



DISCUSSION

Vertigo brought on by head movements is known as positional vertigo. The primary factor in the pathophysiology of BPPV is most likely the disruption in calcium and vitamin D metabolism that occurs in osteoporosis.[7] The otoconia matrix and density are impacted by vitamin D levels and calcium crystal deposition in a manner akin to that of bone structures. BPPV severity and recurrence were associated with vitamin D deficiency. In fact, using vitamin D supplements may reduce the frequency of BPPV recurrent attacks.[8,9]This study was performed to assess the role of vit D in benign paroxysmal positional vertigo.

We observed that group I comprised of 19 males and 17 females, group II had 16 males and 20 females and group III had 18 males and 18 females. Jeong et al[10] showed that in patients with serum vitamin D between 10-20 ng/ml, the risk of BPPV increases 3.8 times, whereas, in patients with serum vitamin D, less than 10 ng/ ml, the risk increases by odds of 23.

We observed that the mean vitamin D level at baseline, 3 months and 9 months in group I was 11.9 mg/ml, 33.1 mg/ml and 36.4 mg/ml respectively. In group II was 10.3 mg/ml, 10.7 mg/ml and 11.8 mg/ml. In group III was 34.5 mg/ml, 35.8 mg/ml and 37.3 mg/ml respectively. Lopez-Escamez et al[11] assessed the long-term results and health-related quality of life (HRQoL) of patients treated with particle repositioning maneuver (PRM) in the outpatient clinic of a general community hospital for posterior canal benign paroxysmal positional vertigo (PC-BPPV). Forty-five (90%) of the fifty PC-BPPV patients that were included finished the study. The history of brief vertigo episodes and positional nystagmus during the Dix-Hallpike test (DHT) served as the basis for the diagnosis. Every patient received a single PRM, and at 30, 180, and 360 days after treatment, relapses were

assessed by DHT; if the DHT resulted in a positive result, a new PRM was conducted. Scores on the Medical Outcomes Study 36-Item Short Form Health Survey (SF-36) and the Dizziness Handicap Inventory Short Form (DHI-S) before and 30 and 180 and 360 days after therapy, as well as the proportion of patients with a negative DHT after treatment, were the primary end measures. At 30 days, 80% of people (40/50) had negative DHT results. At 30, 180, and 360 days, respectively, ten, seven, and five individuals showed a positive DHT. Despite recurrent PRM, 5% (2/50) of patients had persistent BPPV after 360 days. At 180 and 360 days, relapses (DH+ following successful PRM) were noted in 7.5% (3/50). When the reference population normative data was compared to the average standardized score for each SF-36 scale, all scales—aside from vitality—showed deviations from the norms. Patients' ratings on both instruments improved after PRM, suggesting that HRQoL had returned after 30 days. The SF-36's physical dimension scores increased from day 30 to 360. Following PRM, DHI-S scores were significantly higher ($P < 0.001$).

We observed that the intensity of BPPV decreased in group I, increased in group II and decreased in group III over 3 months and 9 months period. Buki et al[12]suggested that there is a relation between insufficient vitamin D level and benign paroxysmal positional vertigo.In order to test this hypothesis, in a small retrospective pilot study, 25-hydroxyvitamin D levels in serum of patients with benign paroxysmal positional vertigo and frequency of recurrence after correction of serum level were assessed retrospectively. Patients with idiopathic positional vertigo had a low average serum level of 25-hydroxyvitamin D (23 ng/mL) similar to that of the general Austrian population, which has a high prevalence of hypovitaminosis D. In 4 cases with chronically recurrent severe vertigo episodes, average levels of serum 25-hydroxyvitamin D were even significantly lower than in the other vertigo patients, who had their first episode. Vertigo attacks did not recur after supplementation with vitamin D.

CONCLUSION

Authors found that rehabilitative therapy benefits from the restoration of vitamin D insufficiency in BPPV in terms of improved duration.

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