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Research Article

Is There an Association Between Benign Paroxysmal Positional Vertigo and the COVID-19 Pandemic?

Pandemi Sürecinde Bulunmanin Benign Paroksismal Pozisyonel Vertigo İle İlişkisi Var Mı?

Serif Samil Kahraman, Fatih Yucedag

Karamanoglu Mehmetbey University, Facult of Medicine, Department of Otorhinolaryngology, Karaman, Turkey

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Abstract

Aim: To determine whether or not there is any relationship between benign paroxysmal positional vertigo (BPPV) and the COVID-19 pandemic.

Material and Methods: The study included 67 patients who presented at Karaman Training and Research Hospital between November 2020 and February 2021, were diagnosed with BPPV with provocative tests, and were applied with canal-specific repositioning manoeuvre. The patients were questioned in respect of how many days after the onset of dizziness complaints they presented at the polyclinic, whether or not they had previously experienced such an attack, how many times the manoeuvre was applied in treatment, and when the dizziness recovered after the manoeuvre. The patients were followed up for 12 months in respect of recurrence.

Results: The 67 patients comprised 64.2% females and 35.8% males with a mean age of 55.34±16.58 years. A previous attack was reported by 80.6% of the patients. During the mean 12-month follow-up period, 94% of the patients experienced no new attack. The mean number of therapeutic manoeuvres applied to each patient was 1.5. There was determined to be a history of COVID-19 infection in 14 patients.

Conclusion: The results of the study showed that there seemed to be a relationship between BPPV and the pandemic by COVID-19 infection affecting the peripheral vestibular system. The association with COVID-19 infection did not cause any increase in the number of therapeutic manoeuvres or BPPV recurrence. Further studies will contribute to clarifying this condition.

Keywords: Benign paroxysmal positional vertigo, Recurrence, COVID-19, Dizziness

Öz

Amaç: Bu çalışmamızda COVID-19 enfeksiyonuna bağlı pandemi sürecinde bulunmanın BPPV ile ilişkisi araştırılmaktadır.

Materyal ve Metot: Bu çalışmaya 2020 Kasım-2021 Şubat arasında Karaman Eğitim ve Araştıma Hastanesi'ne başvuran ve kendisine provakatif testlerle BPPV tanısı konulup kanala spesifik repozisyon manevrası uygulanan 67 hasta çalışmaya dahil edildi. Hastalara baş dönmesi şikayeti başladıktan kaç gün sonra polikliniğe başvurdukları, daha önce atak geçirip geçirmedikleri, tedavi için kaç defa manevra uygulandığı ve manevra sonrası baş dönmelerinin ne zaman düzeldiği soruldu. Rekürrens açısından hastalara 12 ay takip süreci uygulandı.

Bulgular: Çalışmaya katılanların %64.2'si kadın, %35.8'i erkeklerden oluşmaktaydı. Hastaların ortalama yaşları 55.34±16.58 idi. Hastaların %80.6'sinin daha önce atak geçirmedikleri tespit edildi. Ortalama 12 aylık takip sürecinde hastaların %94'ünde yeni bir atak tespit edilmedi. Hastalara uygulanan tedavi edici manevra sayısının ortalama 1.5 olduğu gözlendi. Hastaların 14'ünde COVID-19 enfeksiyonu öyküsü mevcuttu.

Sonuç: Çalışmamızda, COVID-19 enfeksiyonuna bağlı pandemi süreci periferik vestibüler sistemi etkileyerek BPPV ile ilişkili gibi görülmektedir. COVID-19 enfeksiyonuna bağlı pandemi süreci tedavi manevra sayısında ve BPPV rekürrensinde de bir artışa neden olmamaktadır. Bu konuda yapılacak çalışmalar bu durumun aydınlatılmasında bize ayrıca katkı sağlayacaktır.

Anahtar Kelimeler: Benign paroksismal pozisyonel vertigo, Rekürrens, COVID-19, Dizziness

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Corresponding Author: Serif Samil Kahraman, Karamanoglu Mehmetbey University, Facult of Medicine, Department of Otorhinolaryngology, Karaman, Turkey, **E-mail**: drserifsamil@gmail.com

INTRODUCTION

Benign paroxysmal positional vertigo (BPPV) is a disease characterised by temporary nystagmus and vertigo triggered by changes in head position, and is the most common cause of peripheral type vertigo. Movement within the semicircular canal of separated fragments of otoconia is thought to be in the pathogenesis. The diagnosis of BPPV is made from patient history and the observation of typical positional nystagmus following the application of a provocative manoeuvre (1).

A previous study has shown a relationship between BPPV and positive viral serology in certain months of the year, especially in spring and autumn. It was reported in that study that the viral infection could cause the formation of BPPV attacks by causing the development of vestibulopathy or through the infection-related neurolabyrinth pathway (2).

There are few studies in literature which have examined the relationship between BPPV and COVID-19 infection. The aim of this study was to examine the relationship between BPPV determined during the pandemic associated with COVID-19 infection.

MATERIAL AND METHOD

The study included patients who presented at Karaman Training and Research Hospital, who were diagnosed with BPPV with provocative tests, and were applied with canal-specific repositioning manoeuvre. The patients were re-evaluated after 1 week, and recovery of nystagmus and symptoms was accepted as sufficient treatment. Patients were excluded from the study if the manoeuvre could not be applied, if they were mentally unbalanced, were determined with central vertigo, or were in the paediatric age group.

The files of 80 patients who met these conditions between November 2020 and February 2021 were examined. After implementation of the exclusion criteria and patients who withdrew during follow-up, the results of 67 patients were analyzed. The patients were followed up for 12 months in respect of recurrence.

A record was made for each patient of how many days after the onset of dizziness complaints they presented at the polyclinic, whether or not they had previously experienced such an attack, how many times the manoeuvre was applied in treatment, and when the dizziness recovered after the manoeuvre. Conditions such as osteoporosis, ear surgery, and head trauma were recorded in respect of the risk of recurrence.

Approval for this retrospective clinical study was granted by the Clinical Research Ethics Committee of Karamanoglu Mehmetbey University Medical Faculty (decision no:07-2021-12; dated:11.10.2021). Permission for the study was also obtained from the Ministry of Health. All procedures were applied in accordance with the 2008 Helsinki Declaration. All patients provided written informed consent.

Data obtained in the study were analyzed statistically using IBM SPSS vn.22.0 software. The Chi-square test and the Independent Samples t-test were used in the data comparisons. A value of $p<0.05$ was accepted as statistically significant.

RESULTS

The patients included in the study comprised 64.2% females and 35.8% males, giving a female /male ratio of 1.79/1, with a mean age of 55.34±16.58 years. No statistically significant difference was determined between the genders in respect of age. No significant difference was determined in respect of the time of presentation at the polyclinic, the number of manoeuvres applied, the time to recovery of dizziness, and recurrence of attacks according to age and gender ($p>0.05$).

A history of BPPV attack was determined in 80.6% of the patients. During the follow-up period of mean 12 months, 94% of the patients experienced no new attack. The number of therapeutic manoeuvres applied to the patients was observed to be mean 1.5 (Table 1). The time of presentation at the polyclinic was mean 6 days after the onset of complaints and the mean time to recovery of dizziness was 10 days.

A risk factor for BPPV, mostly osteoporosis, was determined in 8 patients. There was a history of COVID-19 infection in 14 of the 67 patients. Of these, 11 had not previously experienced an attack of BPPV, and 13 patients were determined to have experienced the BPPV attack following COVID-19 infection.

Table 1. The number of manoeuvres applied to patients and percentage values

No. of manoeuvres	No.of patients	Percentage (%)	Total % value
1	45	67.2	67.2
2	15	22.4	89.6
3	4	6	95.5
4	2	3	98.5
5	1	1.5	100
Total	67	100	100

DISCUSSION

The most frequently seen general symptoms during the COVID-19 pandemic are listlessness, fatigue, headache, fever, and myalgia (3). In a study by Elibol, it was reported that other symptoms such as vertigo, tinnitus, and sudden hearing loss, which are otorhinolaryngological symptoms, were less frequently seen than the most commonly seen symptoms such as cough, anosmia, changes in sense of taste, and sore throat in patients determined with

COVID-19 infection. It was also shown in that study that otorhinolaryngological symptoms were seen more often in females than in males (4).

Picciotti et al reported that BPPV was determined in 8 patients following COVID-19 infection, and these were all successfully treated with therapeutic manoeuvres. In that study, the occurrence of BPPV after COVID-19 infection was considered to be linked to the prolonged bedrest and drugs used, and especially to the secondary inflammatory response and the direct damage to the peripheral vestibular system by the viral infection associated with the interaction of the otolithic membrane related to the cytopathic effect of the virus (5). In another study, the number of BPPV patients were compared in the months of July and August in 2019 before the pandemic, and in 2020, during the pandemic. There was observed to be an increase in the prevalence of BPPV during the preventative quarantine for COVID-19 and at a higher rate in females (6). BPPV was determined more often in the current study females, consistent with that study. In another study that showed that BPPV developed after COVID-19 infection, it was reported that the effect on the inner ear blood supply associated with microthrombus and hypercoagulation could be responsible in the pathophysiology (7).

Although the cause of BPPV is not known in the majority of cases, previous studies have shown an association with age over 65 years, female gender, the presence of osteoporosis, various diseases affecting the inner ear, prolonged bedrest, and head trauma (8-12). The predominance of female gender (1.79/1) in the current study was seen to be consistent with the literature .

In the current study, the predominance of female gender, the prolonged bedrest of patients associated with the pandemic, the greater number of patients who had not had a previous attack, and that the majority of the patients were determined with BPPV following COVID-19 infection, suggest that there could be a relationship between BPPV and the COVID-19 pandemic. Probable reasons for this could be the restricted physical activity of elderly patients because of the pandemic precautions, a more sedentary lifestyle because of various restrictions related to the pandemic, prolonged bedrest of patients who had contracted COVID-19 infection, the viral load associated with the pandemic (13), direct damage to the peripheral vestibular system caused by the viral infection (5), and inner ear blood supply affected by the virus (7).

The success of the therapeutic manoeuvres in the current study was observed to be consistent with the findings of previous studies (14). When the number of therapeutic manoeuvres applied to the patients and the fact that no new attack was determined in 94% of the patients during the follow-up period of mean 12 months are taken into consideration, these suggest that the pandemic had no short-term effect in respect of the recurrence of BPPV and did not cause an increase in the number of therapeutic manoeuvres required.

A previous study in Turkey showed a relationship between BPPV and positive viral serology especially in the spring and autumn months, and reported that viral infection led to BPPV attacks (2). Another study from the USA reported that a fall in Vitamin D level associated with seasonal changes in early spring led to BPPV attacks (14). When the previous study from Turkey is taken into consideration together with the inclusion of the autumn months in the current study, an increase in viral infection at the same time as seasonal changes could be thought to conribute to the formation of BPPV.

The time of presentation of patients at the polyclinic was determined to be mean 6 days, suggesting that being in a period of pandemic and the presence of some restrictions did not cause an interruption or lengthening of time to presentation at the polyclinic. Previous studies have shown that the period of residual dizziness after BPPV can last from a few days to a few weeks (15,16). Consistent with those studies, the time to recovery of dizziness in the current study was determined to be mean 10 days. According to this finding, the pandemic did not seem to cause any prolonged duration of residual dizziness.

CONCLUSION

The results of this study show that by affecting the peripheral vesttibular system, the pandemic related to COVID-19 infection seems to be associated with BPPV. However, the COVID-19 pandemic conditions did not cause an increase in the number of therapeutic manoeuvres or in recurrence of BPPV. Further studies on this subject will contribute to clarifying this condition.

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