



ORIGINAL RESEARCH

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Seasonal distribution of the incidence of bell's palsy

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Abstract

Bell's palsy is known to be related to cold weather. In temperate countries, a significant decrease has been determined in incidence. The aim of this study was to determine the incidence of Bell's palsy in the city of Antalya, which is warmer than many other regions in Turkey, and to evaluate the relationship between the incidence and the seasons. A retrospective evaluation was made of 1143 patients who presented with facial paralysis at the Emergency Room or the Ear, Nose, and Throat Polyclinic of the Health Sciences University Training and Research Hospital, Antalya between January 2005 and January 2016. A total of 816 patients were accepted as Bell's palsy with no etiological factor and were included in the study. The age and gender of the patients were evaluated separately according to the month and season in which the facial paralysis was seen. Statistical analysis was made by separating the patients into age subgroups of 0-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, and >79 years. The 816 patients with Bell's palsy comprised 435 (53%) females and 381 (46%) males with a mean age of 42.9 years. In the age range subgroups, 15 (1.8%) patients were in the 0-9 years, which was a significantly lower number than the other groups ($p < 0.001$). The etiology of Bell's palsy has not yet been fully clarified. However, an increase in incidence has been shown in cold weather in particular. Whatever the climatic conditions, the incidence of Bell's palsy increases in the coldest months. Furthermore extensive multicenter series on this subject would more clearly show the relationship of Bell's palsy with the seasons.

Keywords: Bell's palsy, seasonal, facial paralysis.

Introduction

Facial paralysis is a complete or partial function loss in the mimetic muscles of the face related to the damage in the motor fibers of the facial nerve [1]. If the damage occurring in the facial nerve is in the proximal of the motor nuclei in the pons, it is central facial paralysis, and if in the distal, then it is known as peripheral facial paralysis [1,2]. The majority of cases of facial paralysis are of the peripheral type, and the most common cause of peripheral facial palsy is Bell's palsy [2,3].

Bell's palsy, which was first described by Sir Charles Bell in 1821, is partial or full peripheral facial nerve paralysis which has an acute onset, is idiopathic and generally involves only one side of the face [3,4]. The most recent literature has reported the annual incidence as 10-40/100,000 in the general population [1,2].

Bilateral involvement is seen in 0.3% of Bell's palsy patients [4]. Although it is seen at all ages, it is most frequent in the 15-40 years age group. Diagnosis of peripheral facial paralysis is made by discounting infective, degenerative, and traumatic reasons [2,3].

The etiology of Bell's palsy is not fully known, but in recent years, hypotheses have focused on vascular ischemia and viral infection [5]. Bell's palsy is seen more frequently in cold regions; this fact supports this hypothesis. It is thought that with vasomotor changes in a facial region exposed to cold, the development of partial ischemia in that area creates inflammation around the nerve and cold air again more easily reactivates the latent remaining viral infection [5,6]. Although several viral causes have been held responsible in the etiology of Bell's palsy, the herpes simplex virus (HSV) has often been focused on in recent years. In a study by Mukorami et al. [6], DNA of the herpes simplex virus was found on the facial nerve endoneurium of patients diagnosed with Bell's palsy, and in an experimental rat study, Takahashi et al. [7] showed that facial paralysis developed as a result of latent HSV reactivation, thereby supporting this theory. However, as there is

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no dramatic effect on facial paralysis of antiviral agents effective in HSV infection, the viral infection theory alone has been shown to be insufficient.

There is known to be a relationship between Bell's palsy and cold. Therefore, it is thought that theoretically, the incidence should be lower in hot climates. However, studies of incidence conducted in cities of the Mediterranean region have shown no significant decrease in the incidence of Bell's palsy compared to cities in other colder climates. Nevertheless, even in temperate climate conditions, Bell's palsy is seen more frequently in the coldest seasons [2,8].

The aim of this study was to evaluate the relationship between the seasonal incidence and the incidence of Bell's palsy in the city of Antalya, which is more temperate than in other regions in Turkey.

Material and Methods

A retrospective evaluation was made of 1143 patients who presented with facial paralysis at the Emergency Service or the Ear, Nose, and Throat Polyclinic of the Health Sciences University Training and Research Hospital, Antalya between January 2005

and January 2016. Patients were excluded if they had chronic otitis media, if the facial paralysis had developed after trauma, because of a mass in the parotid region, or after surgery in this region, or if the facial paralysis developed associated with a tumor such as acoustic neuroma. A total of 816 patients were accepted as Bell's palsy with no etiological factor and were included in the study. The age and gender of the patients were evaluated separately according to the month and season in which the facial paralysis was seen.

Results

The 816 patients with Bell's palsy comprised 435 (53%) females and 381 (46%) males with a mean age of 42.9 years. Statistical analysis was made by separating the patients into age subgroups of 0-9, 10-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70-79, and >79 years (Figure 1). In the age range subgroups, 15 (1.8%) patients were in the 0-9 years, which was a significantly lower number than the other groups ($p<0.001$). Bell's palsy was seen most in January. When the distribution was examined according to seasons, 239 patients presented in winter, 210 in spring, 159 in summer and 208 in autumn. Only the increase in winter was statistically significant ($p<0.01$) (Figure 2).

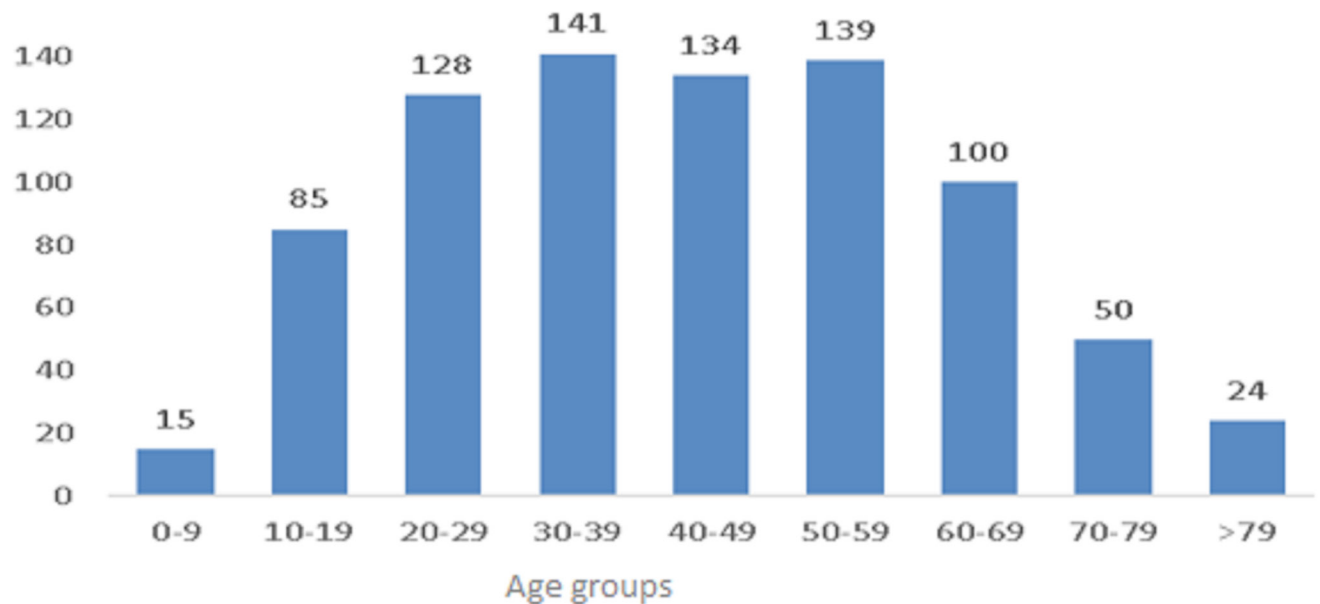


Figure1. The incidence of Bell's palsy according to age

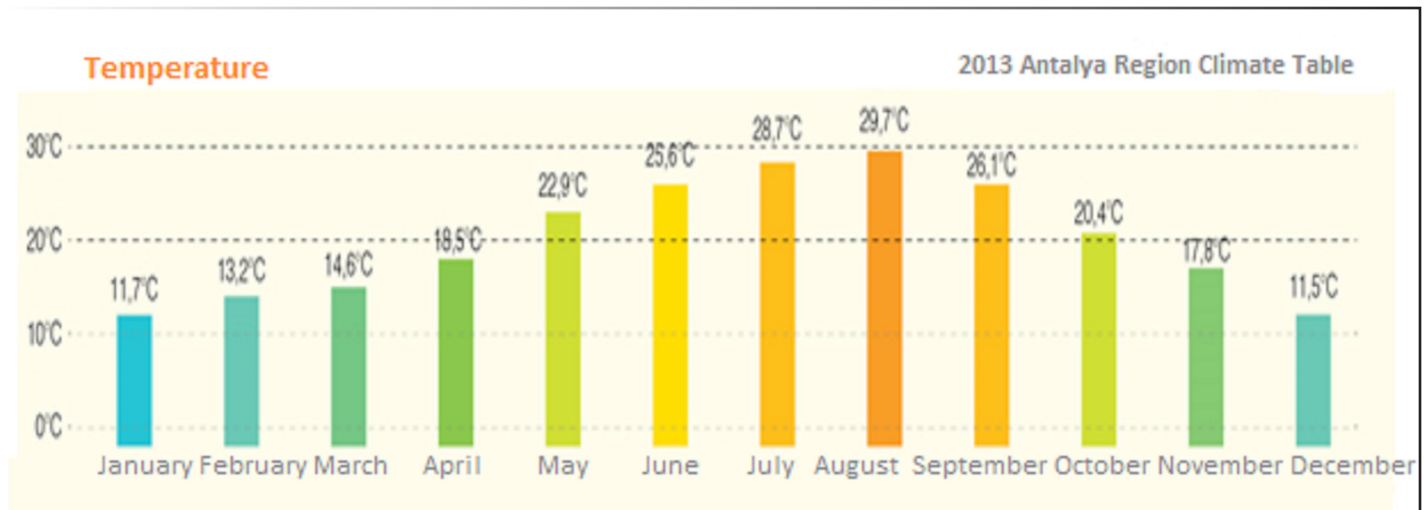


Figure 2 A. The mean temperatures of Antalya in 2017, according to the Meteorology Department

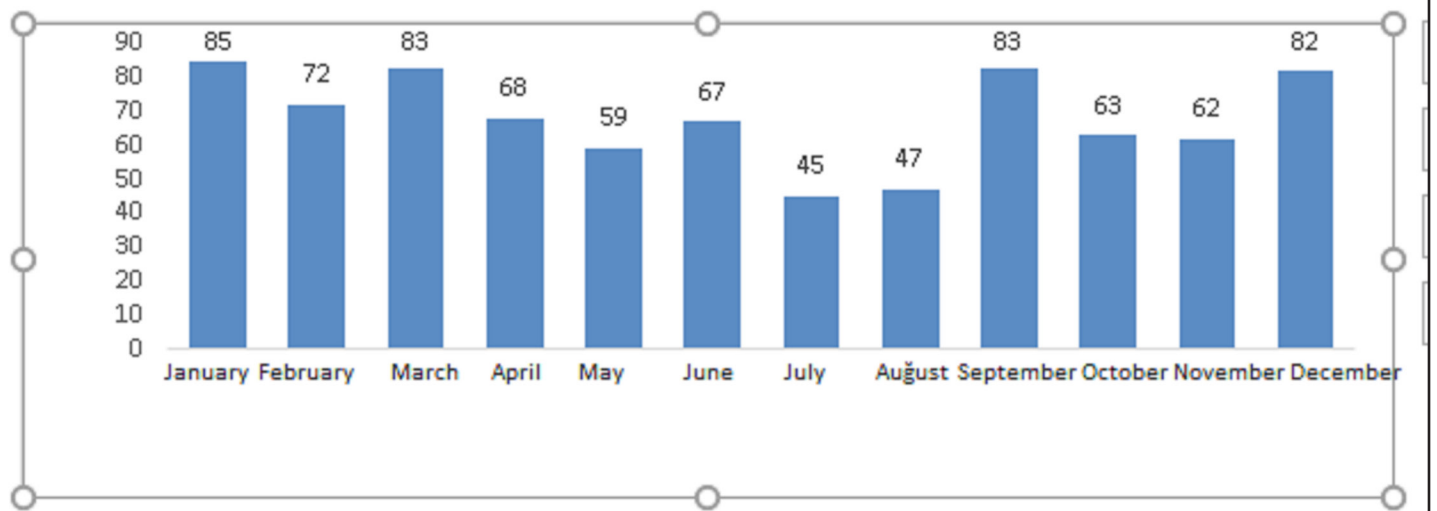


Figure 2 B. The incidence of Bell's palsy according to the seasons

Discussion

Facial nerve paralysis can be seen associated with several different reasons. Although genetic factors, vascular ischemia, and inflammation developing related to viral infection, autoimmune diseases, temporal bone fractures, head-neck tumors, and central nervous system lesions have been held responsible in the etiology, debate on this subject is ongoing (9). Despite continuing advances in the medical field, an etiological factor cannot be found in two-thirds of cases of facial paralysis, and this group is defined as idiopathic facial nerve paralysis or Bell's palsy (2,3,8,9).

The most common type of idiopathic facial paralysis or Bell's palsy is peripheral facial palsy (2,9). It is a peripheral sub motor neuron disease, which is typically self-limiting, has an acute onset, of unknown cause and affects all the muscle groups on only one side of the face. The most common symptom in patients is facial motor dysfunction, which can vary according to the amount of neural damage from mild paresis to complete paralysis. Clinical findings generally vary according to the localization of the lesion in the facial nerve (9).

The relationship of Bell's palsy with the seasons is still not very clear. No significant increase has been reported in the incidence of Bell's palsy in temperate climates compared to cold climates (9,10). However, whether in temperate or cold climates, there is an increase in Bell's palsy in the coldest months of the region. Even if vascular ischemia and viral infections are held responsible for this, both human and animal studies have shown changes in several factors such as hormones, blood pressure, thrombocyte physiology, metabolism and weight in cold weather. Thus, in cold weather, blood viscosity increases, coagulation factors in the blood increase, and more atherosclerosis and thrombotic events are seen than in hot weather. This causes an increase in cold weather of diseases such as stroke, myocardial infarct, and retinal vein occlusion. Therefore, while cold weather increases viral infection reactivation, at the same time, the chain causing vascular ischemia is exacerbated (2,8).

In a study by Hsieh et al. (5) of Bell's palsy incidence, which was conducted in the subtropical climate of Taiwan, no statistically significant difference was determined between the seasons. However, when age subgroups were examined, while there

was a statistically significant increase in the incidence of Bell's palsy in cold seasons in those aged < 50 years, no difference was determined in patients aged >50 years. Spengos et al. (8) showed that Bell's palsy incidence was lower in the summer months and higher in the autumn and winter months and the month with the highest incidence was January. In the current study, the highest incidence of Bell's palsy was determined in the winter months, especially in January. A drop in the incidence of Bell's palsy was determined in the warmer seasons. While the incidence fell in hot weather such as in July and August, with the transition to autumn, an increase was again seen in September.

Conclusion

The etiology of Bell's palsy is still not clear. However, the incidence shows an increase in cold weather in particular. Whatever the climatic conditions, the incidence of Bell's palsy increases in the coldest months of the year. There is a need for further multicenter studies of more extensive series to more clearly show the relationship of Bell's palsy and the seasons.

Conflict of interest

The authors declare that there are no conflicts of interest.

Financial Disclosure

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Ethical approval

Consent of ethics was approved by the local ethics committee.

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