

# Prevalence of facial nerve palsy in the neuro-medicine private clinic

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## ABSTRACT

**Background.** Due to dysfunction of the facial nerve (CN VII), Bell's palsy occurs which is a facial paralysis of unknown cause, but viral infection is suspected. The study aims to determine the prevalence of facial nerve palsy in a private clinic in Basrah.

**Methods.** The study was conducted at a private clinic and involved sixty-five patients with facial nerve palsy. It was a cross-sectional study in which any patient who attended the clinic and exhibited signs and symptoms of lower motor neuron facial nerve palsy underwent an examination to confirm the diagnosis and, if confirmed, were included in the study. While patients with other neurological disorders were excluded. Data collection started between October 1, 2022, and April 30, 2023. A total of 65 patients from the private clinic—males and females—aged from 4 to 70 years old were confirmed as having lower motor neuron facial nerve palsy.

**Results.** This study at a private clinic found that Bell's palsy was the most common facial paralysis, affecting more males than females and most of the patients in the age range of 18-39 years, also affecting mostly the left side, with onset more frequent during hot and cool weather conditions. Diabetes was significantly related to the onset of Bell's palsy and weather temperature at the time of the clinic visit.

**Conclusion.** Bell's palsy has a peak age prevalence in the second and third decades of life, and temperature variations have no effect on the occurrence of Bell's Palsy. Further studies are needed for an accurate estimation of the number of cases, to assess the severity, impact, and efficacy of Bell's palsy management.

**Keywords:** Bell's palsy, facial nerve, facial paralysis, lower motor neuron, viral infection

## INTRODUCTION

Disorders of the facial nerve result from injury to the nerve that regulates facial movement and expression. Viral infections, strokes, inflammation, trauma, surgeries, tumors or others can all cause paralysis or weakness of the face [1,2]. Bell's palsy is the most prevalent defect in the lower motor of the facial nerve [3]. Bell's palsy, also known as Idiopathic Peripheral Facial Palsy, is a facial paralysis that is caused by a malfunction of the Cranial Nerve VII, the Facial Nerve [4].

In the UK, the yearly incidence of Bell's palsy currently stands at 37.7 per 100,000 people [5]. Comparatively, it is around 23 per 100,000 persons annually

in the US [6]. Between 11.5 to 40.2 incidences of Bell's palsy are reported worldwide for every 100,000 individuals [7].

It is critical to determine if the facial nerve paralysis is central or peripheral. Central lesions cause paralysis of the lower face only, sparing the forehead; however, clinicians must ensure that they ask about the duration and nature of symptoms in their history, including the presence of associated symptoms such as hyperacusis, posterior auricular pain, taste, and lacrimal changes. All patients who come with facial palsy require a comprehensive cranial nerve evaluation, as well as ophthalmic, otologic, and oral tests [8].

The impact of DM is explained by the peripheral circulatory dysfunction associated with diabetes that

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affects the feeding vessels to the facial nerves and frequently results in the microcirculatory insufficiency and edema that are the hallmarks of Bell's palsy [9]. Numerous elements have been proposed as contributing factors to BP's healing process. Diabetes is the most notable of these issues. It is widely held that diabetes adversely affects the recovery of BP. Although a link between diabetes and Bell's palsy has been hypothesized, controlled studies are few [10].

Bell's palsy can have a detrimental impact on oral health. The production of tears and saliva may be increased or decreased as a result of nerve injury. Xerostomia, which raises the risk for dental caries, may be experienced by patients with decreased salivary flow, specifically diabetic patients. The consequences of xerostomia can be treated using a variety of products, including those that contain fluoride, calcium phosphate technology, antimicrobials, sodium bicarbonate, and xylitol. By enhancing saliva's ability to act as a buffer, these compounds may enhance lubrication and reduce the loss of minerals from tooth surfaces. Dental professionals might want to consider these methods as well as the use of fluoride varnish and/or prescription home-based fluoride therapy due to the elevated risk of caries in this population [11,12].

Loss of muscle tone and excessive drooling might cause patients to develop angular cheilitis, which can be managed with antifungal medications. The patient's ability to chew their food may be impaired by the lack of muscular tone on the affected side. Due to the weakened buccinator muscle, which helps move food onto the occlusal plane, food can also get stuck in the vestibule of the cheek. This could result in an increased formation of dental plaque. Therefore, dental professionals must stress to Bell's palsy patients the significance of brushing and flossing twice daily. A therapeutic mouthwash and irrigation with a dental water jet may be added to the self-care routine. Interdental brushes and flossing aids have to be suggested if flossing compliance is a problem. Additionally, patients should rinse with water after eating to get rid of any food debris that might have been stuck in the vestibule [11,12]. Bell's palsy affects the muscles that surround the eye, making it difficult to close the eyelid on the side that is affected; as a result, protective eyewear must be used during dental treatment [11].

Aim of the study was to estimation of the prevalence of facial nerve palsy and to identify the relation between diabetes mellitus and facial nerve palsy.

## METHODS

### Study setting and design

The study was conducted in the private clinic of Al-Sayyab complex in the province of Basrah, Iraq.

### Study sample

It was a cross-sectional study in which any patient who attended the clinic and exhibited signs and symptoms of lower motor neuron facial nerve palsy underwent an examination to confirm the diagnosis and, if confirmed, were included in the study. While patients with other neurological disorders were excluded. Data collection started between October 1, 2022, and April 30, 2023. A total of 65 patients from the private clinic—males and females—aged from 4 to 70 years old were confirmed as having lower motor neuron facial nerve palsy. Patients were evaluated and classified based on age, address, the onset of the attack, the affected side, whether it was right or left, recurrent or nonrecurrent and if diabetes mellitus played a role, taking into consideration the weather's temperature variations at the time the patients visited the clinic.

### Ethical consideration

An ethical clearance has been obtained from the ethical committee of the Faculty of Basrah Dental College and an informed consent has been signed after explaining the objectives of the study.

### Data analysis

IBM SPSS Statistics 26.0 was used to analyze the data and find the statistical significance of the various variables. When applicable, descriptive and analytical statistics, such as mean, have been performed. Significant data was defined as a p-value of less than 0.05.

## RESULTS

Out of the 65 cases, the male cases represent (52.3%) while the female cases (47.7%) and the ages ranged between 4 and 70 years. Most of the patients were within the age range of 18-39 years. There was no scientifically significant relation between age and any of the other variables, as shown in Table 1.

Although the value did not turn out to be significant, the occurrence of facial nerve palsy was particularly higher on the left side (55.4%) as compared to the right side (44.6%), as shown in Table (1). Only 4 cases had recurrence; in 2 of them, Bell's palsy recurred on the opposite side. Only 2 cases reported improvement.

Most cases are from the province's center (49.2%) as compared to the periphery (50.8%) with nearly 48 cases that had started a few days ago, 7 cases started a few weeks ago and 10 cases started before a few months, as shown in Table 1. The distribution of the patients among the four temperature ranges was 32.3% during hot weather, 30.8% during cool weather, 23.1% during cold weather, and 13.8% during warm weather, as shown in Table 1 as well.

**TABLE 1.** Cross tabulation of age with all variables

		Age				Total	P Value
		Under 18	18-39	40-60	Above 60		
Weather*	Hot	8	8	5	0	21	0.496
		12.3%	12.3%	7.7%	0	32.3%	
	Cool	7	10	3	0	20	
		10.8%	15.4%	4.6%	0	30.8%	
	Cold	3	6	4	2	15	
		4.6%	9.2%	6.2%	3.1%	23.1%	
Warm	1	5	2	1	9		
	1.5%	7.7%	3.1%	1.5%	13.8%		
Recurrence	Yes	0	4	0	0	4	0.287
		0	6.2%	0	0	6.2%	
	No	19	25	14	3	61	
		29.2%	38.5%	21.5%	4.6%	93.8%	
Address	Periphery	11	13	7	2	33	0.782
		16.9%	20.0%	10.8%	3.1%	50.8%	
	Center	8	16	7	1	32	
		12.3%	24.6%	10.8%	1.5%	49.2%	
Diabetic	Yes	1	4	2	0	7	0.762
		1.5%	6.2%	3.1%	0	10.8%	
	No	18	25	12	3	58	
		27.7%	38.5%	18.5%	4.6%	89.2%	
Sex	Male	12	14	7	1	34	0.652
		18.5%	21.5%	10.8%	1.5%	52.3%	
	Female	7	15	7	2	31	
		10.8%	23.1%	10.8%	3.1%	47.7%	
Onset	Days	14	22	9	3	48	0.815
		21.5%	33.8%	13.8%	4.6%	73.8%	
	Weeks	1	3	3	0	7	
		1.5%	4.6%	4.6%	0	10.8%	
	Months	4	4	2	0	10	
		6.2%	6.2%	3.1%	0	15.4%	
Side	Right	6	14	7	2	29	0.520
		9.2%	21.5%	10.7%	3.0%	44.6%	
	Left	13	15	7	1	36	
			23.0%	10.7%	1.5%	55.4%	

**TABLE 2.** Cross tabulation of diabetics with onset of Bell’s palsy

			Days	Weeks	Months	P Value
			Diabetic	Yes	Count	
% within Onset	28.5%	43.0%			28.5%	
No	Count	46		4	8	
	% within Onset	79.3%		6.9%	13.8%	

Patients who had concomitant diabetes mellitus were 10.8% and diabetic patients attending the clinic weeks after the onset of Bell’s palsy were significantly higher (43.0%) than diabetic patients attending days (28.5%) or months (28.5%) after the onset with a P value of 0.009. As shown in Table 2.

As shown in Table (3), diabetic patients exhibited a significant association with temperature changes when they visited the clinic, with the majority of cases (71.5%) being reported during the cool temperature range and no cases of diabetic patients were reported during the hot or warm weather (P=0.034).

**TABLE 3.** Cross tabulation of diabetics with weather

			Hot	Cool	Cold	Warm	P Value
Diabetic	Yes	Count	0	5	2	0	0.034
		% within Weather	0.0%	71.5%	28.5%	0.0%	
	No	Count	21	15	13	9	
		% within Weather	36.2%	25.9%	22.4%	15.5%	

**TABLE 4.** Cross tabulation of onset of Bell's palsy with weather

			Hot	Cool	Cold	Warm	P Value
Onset	Days	Count	12	15	12	9	0.287
		% within Weather	25.0%	31.2%	25.0%	18.8%	
	Weeks	Count	4	1	2	0	
		% within Weather	57.1%	14.3%	28.6%	0.0%	
	Months	Count	5	4	1	0	
		% within Weather	50.0%	40.0%	10.0%	0.0%	

On the other hand, Cases recorded during warm weather all had their onset of attack within days, while cases with onset a week or more ago were mostly recorded during hot weather. The same applies to attacks with onset a month or more ago. However, the analysis of onset in relation to temperature variations did not yield any scientific significance, as shown in Table 4.

## DISCUSSION

All the cases of lower motor neuron facial nerve palsy that were included in the study were confirmed to be Bell's palsy rather than other causes of lower motor neuron facial nerve palsy. As mentioned in the literature currently published, BP is the most common cause of facial nerve palsy [13]; specifically lower motor neuron facial nerve palsy [14]. The prevalence can be approximated to 20 patients per 1000 patients attending the clinic during the six months of data collection. An estimation of the prevalence of Bell's palsy in this locality was tried; however, a larger sample and a multicentric study are needed in order to achieve this objective more accurately.

In this study, the age range was notably broad which is a similar case in most studies [13,15,16]. In addition, age variable analysis has shown that most cases are during adulthood, this is consistent with a number of earlier studies that found young adults and middle-aged persons are more likely to develop Bell's palsy [4,13]. A possible explanation is that risk factors cumulate in this age group, with pregnancy, reactivation of viral infections, hypertension and diabetes being the common ones [17].

BP occurred noticeably higher on the left side, which contradicts several research papers that re-

ported a greater percentage of right-side impact reaching 63.2% as in the study by Zhao et al, in 2017. The higher occurrence in males also contradicts numerous studies [13], but is similar to the study mentioned earlier [15].

There was no clear relation between temperature variations and BP in this study as most cases were recorded during hot and cool weather, respectively; the least cases were recorded during warm weather. In contrast to the study by Goloom et al, where most cases reported were during Winter and Spring, respectively [13]. Zhao et al, reported that warm seasons have been found to be when BP occurred most frequently and claimed that increased HSV-1 virus activations could be the appropriate explanation [15]. Older studies contradicted these recent ones as they revealed that the incidence of BP is higher in the cold autumn and winter seasons and stated that the high prevalence of viral infection during these cool months could be the predisposing factor [18, 19].

The frequencies of cases from the province's center versus the periphery were almost equal and no scientific significance was obtained to confirm a valid relationship between the different residential areas and the condition.

In this study, 10.8% of patients with BP were diabetic, which indicates, along with the data analysis, that diabetes plays a significant role in BP pathogenesis. Also, diabetic patients presented relatively late to neurology clinics (weeks after the onset of BP symptoms), this may be interpreted as the patients considering their illness as part of diabetic complications that could resolve by controlling their blood sugar; when the condition did not, they sought medical advice.

Zhao et al also mentioned in their study that the most common comorbid condition was diabetes mellitus and it may be explained as diabetic peripheral facial neuropathy [15]. In this study, no cases of diabetic individuals were documented during either hot or warm weather; Documentation of diabetic patients only during times of cold weather is possibly due to the associated rise in blood sugar levels and relative vasoconstriction both of which exacerbate neuropathy and cause further damage to the peripheral nerves as a complication of DM [20].

Bell's palsy patients should receive prednisolone – as a first-line treatment – with varying dosages depending on each patient's condition. All included patients were treated according to the most recent guidelines of the American Academy of Otolaryngology–Head and Neck Surgery (AAO-HNS) [21,22], which states that steroids should be a part of the management; Acyclovir could be beneficial in addition to steroid therapy as numerous studies revealed that in comparison to single-steroid therapy, the combination therapy appeared to be more effective [23-26]. Moreover, other supportive measures such as eye care and physiotherapy are implemented when applicable.

The main limitation of this study is the small number of patients as well as the narrow time frame that restricted the aspects of the study. However, it paves the way for further studies of the topic that is much needed in the region.

Inferred from the results that were obtained from this study, risk groups in the population of Basrah should be educated regarding their susceptibility to this condition; Diabetic patients, especially, need to be informed about the risk DM holds for neuropathy and their vulnerability to Bell's palsy, especially during the cooler weather. They also need to be informed about how to recognize the symptoms of Bell's palsy with no reluctance to seek immediate medical consultation. Further studies on this topic of matter need to be taken in the region of Basrah within a broader time period; including patients in numerous public and private hospitals and clinics in order to estimate an accurate number of cases in the province and determine further aspects of the disorder including the grades of severity, impact on oral and psychological health as well as the efficacy of BP management.

## CONCLUSION

All facial nerve palsy cases were Bell's palsy in nature with a peak age prevalence in the second and third decades of life, and more than half of the patients were male. This study found no discernible effect of temperature variations in the occurrence of BP but a significant relation was identified between DM and cooler temperature ranges, as well as DM with the onset of the attack. Additionally, no association was observed between patients' residential areas and the condition of interest.

*Conflict of interest:* none declared

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