

Bell's palsy characteristics, clinical manifestations, complications, and prognosis in a primary care setting, a single center study: A retrospective cohort study

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ABSTRACT

Background: Bell's palsy (BP) is a cranial nerve disorder in which unilateral or bilateral paralysis of the facial nerve occurs. The study aims to study BP's characteristics, including its clinical manifestations, prognosis, and complications among adult patients aged 18 years and above. **Methods:** A retrospective study of adult patients diagnosed with BP in a primary care setting [January 2015 to December 2022]. **Results:** The study included a total number of 92 patients with an incidence rate of 23 cases per 100,000 people. The mean age was 43.52 years. The most common symptoms reported were dropping of the mouth at 38.9%, loss of forehead muscle movement at 24.4%, loss of nasolabial fold at 22.2%, loss of facial expressions at 20%, and headache at 18.9%. Immunodeficiency affected 2.3% of the patients. The management of patients involved the use of steroids in 76.1% and the use of antiretroviral medications in 48.9%. Physiotherapy was used in 29.5%. The complete recovery rate during the first year was 90.8%. The rate of complete recovery within two years was 96.9%. **Conclusion:** The incidence of BP in the region seems to be similar to the incidence rate reported elsewhere in the world. The use of antiviral therapy seems to be high despite the controversy around the use of antivirals in the management of BP. The majority of patients with BP recover within the first year.

Keywords: Bell's palsy, clinical features, epidemiology, facial nerve paralysis, primary care, prognosis

Introduction

Bell's palsy (BP) is the most common cause of facial paralysis in the world. It is an acute, unilateral, and rarely bilateral, lower-motor-neuron lesion affecting the facial nerve.^[1] Its annual incidence is 30 cases/100,000 population, with a median

age of onset of 40 years.^[2] Some studies found a slight female preponderance, whereas others found that both females and males are equally affected.^[1,3] The symptoms include facial muscle weakness, dry eye, decreased tears, altered taste sensation, pain in the ear, and hypersensitivity to sounds.^[1]

The etiology of BP is unknown. However, studies suggest the involvement of multiple causes such as viral infection, inflammatory diseases, autoimmune conditions, diabetes, and recent upper respiratory tract infection (URTI).^[4] The

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pathophysiology of BP is considered unique in its occurrence. Thus, different hypotheses for pathogenesis are suggested in many literatures.^[1]

Prednisone in combination with antiviral therapy is the gold standard treatment for BP. Bell's palsy usually improves with time in 80% of patients, and up to 30% of the patients have poor recovery, as they may experience complications such as facial muscle weakness, permanent nerve damage that results in incomplete closure of the eye, facial disfigurement, psychological trauma, and facial pain.^[5]

Primary care settings are often the first point of contact for patients with BP. Therefore, primary care providers must have a clinical knowledge of BP, as early diagnosis and treatment are essential for better outcomes. To our knowledge, few articles have highlighted the clinical manifestations of BP in primary care settings and how it is different from other settings. Therefore, our study aims to evaluate and assess the clinical characteristics, risk factors, and recovery rate among BP patients in primary care settings and to highlight the need for better establishment of local management guidelines that can accurately be recommended based on the patient's condition and preference and to limit the possibility of discrepancies among clinicians and healthcare providers who are treating patients with BP.

Methods

A retrospective chart review of the electronic medical record system of a tertiary hospital in Riyadh, Saudi Arabia, was conducted to screen all adult patients aged 15–60 years old who visited the Family Medicine clinics in the period from January 2015 to December 2022 with the diagnosis of BP. Follow-ups for less than 6 months were excluded for patients who were diagnosed with other causes of facial nerve paralysis such as polyneuropathy, Guillain–Barré syndrome, neoplasms, Ramsay Hunt syndrome, herpes zoster, central nervous system disorders, bilateral facial palsy, iatrogenic facial nerve palsy or have unclear timing of onset.

The following parameters were addressed using patients' medical reports:

Demographics including age, nationality, smoking status, gender, BMI, clinical manifestations, signs and symptoms of BP, pre-existing diseases including diabetes, hypertension, MI, stroke/TIA, coronary artery disease, immunodeficiency (congenital, secondary to transplant, drugs or coexisting medical diseases), concomitant infectious diseases, chronic kidney disease, chronic respiratory diseases [asthma, coronary obstructive pulmonary disease (COPD), lung cancer, sleep apnea], as well as chronic liver disease (alcoholic liver disease, chronic viral hepatitis, non-alcoholic fatty liver disease).

Management included antivirals, steroids, and other non-pharmacological measures such as physiotherapy, eye patches, and eye drops, all of which have been reviewed.

Interventional therapy such as facial nerve grafting, facial nerve decompression, and Sub-Orbicularis Oculi Fat procedure has been recorded. In addition, any complications such as blindness and corneal ulceration were also included. The prognosis was reported as (complete recovery within 3 months, complete recovery within 6 months, complete recovery within 1 year and within 2 years, partial recovery, complete paralysis).

This study was reviewed and approved by the Research Ethics Committee (REC) at King Faisal Specialist Hospital and Research Center (KFSH&RC) on February 20th, 2023 (RAC 2231029).

Statistical analysis

Data analyses were performed using the software package SPSS, version 20.0 by IBM. A descriptive statistic for the variables was reported as mean, and standard deviation and categorical variables were reported as frequencies and percentages. The level of statistical significance will be set at a significance level of 0.05 and 95% CI.

Results

A total of 92 patients with a primary diagnosis of BP were included from January 2015 to December 2022. The mean age at onset was 43.52 ± 18.21 , and male predominance was observed in 58 patients (63%) and 34 (37%) females, respectively [Table 1]. The incidence rate was 23 cases per 100,000 population. Patients' most frequent symptoms associated with the onset of diagnosis were dropping of mouth at 38.9%, loss of forehead muscle movement at 24.4%, loss of nasolabial fold at 22.2%, loss of facial expressions at 20%, and headache at 18.9%, respectively [Table 1].

The main pre-existing comorbidities were mainly diabetes at 33%, hypertension at 30.7%, chronic liver disease at 6.7%, chronic kidney disease at 4.5%, and pregnancy was present at 4.5%. Pre-existing cardiovascular diseases were reported as 5.4%, while those patients with a post or coexisting cardiovascular disease were found to be 2.3% [Table 2].

Out of 92 patients, 76.1% were treated using steroids, and 48.9% were treated using antiviral medications. Out of these patients, 69.8% were treated with acyclovir, 27.9% were treated with valacyclovir, and 2.3% were treated with famciclovir. Physiotherapy was used in 29.5% [Table 2]. The prognosis of BP patients who had complete recovery in 6 months was 82.3%, and for patients who had partially recovered patients was 17.7%. Within 1 year, patients who had a complete recovery were 90.8%, and 9.2% of patients had a partial recovery. Patients with complete recovery in 2 years were 96.9%, and partial recovery was 3.1%.

Discussion

Few studies have investigated the characteristics and clinical manifestation of BP in primary care settings. This study showed

Table 1: General characteristics and clinical manifestation among Bell’s palsy patients (n=92)

Variable	Frequency and Percentage
Age	43.52±18.21
Gender	
Male	58 (63)
Female	34 (37)
Female-to-male Ratio	3:5
BMI	
Underweight	4 (4.4)
Normal weight	9 (9.9)
Overweight	37 (40.7)
Obese	25 (27.5)
Extremely Obese	16 (17.6)
Site	
Right	44 (48.9)
Left	46 (51.1)
Occurrence	
First time	87 (94.6)
Second time or recurrent	5 (5.4)
Signs and symptoms	
Slurred Speech	90 (100)
Ectropion	90 (100)
Dropping of Mouth	35 (38.9)
Loss of forehead muscles movements	22 (24.4)
Loss of Nasolabial fold	20 (22.2)
Loss of Facial expression	18 (20)
Headache	17 (18.9)
Facial Synkinesis	17 (19.1)
Pain Around the Jaw/Behind the Ear	15 (16.7)
Lagophthalmos	14 (15.6)
Drooling	10 (11.1)
Loss of taste	5 (5.6)
Increase Sensitivity to sound	5 (5.6)
Visual Disturbance	4 (4.4)
Ptosis	4 (4.4)
Alacrimia	3 (3.3)

Values are presented as numbers and percentages (%). BMI: body mass index

that the incidence rate is 23 per 100.000 population. This is similar to Kim *et al.*, Alanazi *et al.*, which found that the annual incidence is 23 and 30 per 100,000, respectively.^[6,7] This study found that both sides of the face are equally affected, with ratios of 45.2 and 45.2, respectively. Similar to our study, Pietersen *et al.*^[8] found equal distribution on both sides. A study by Mustafa *et al.*^[9] in Sudan showed a right-side predominance.^[9]

Almost 33% of our study participants had diabetes as the main pre-existing comorbidities. It has been suggested that diabetes causes small vessel disease, which leads to nerve ischemia.^[10] Another study by Pietersen stated that diabetic polyneuropathy and vascular insufficiency are associated with poor outcomes.^[8]

In our study, around 30.7% had hypertension as the main pre-existing comorbidities. Holland, Devriese, *et al.*, and Katusic *et al.* concluded that hypertension is a risk factor for BP^[11,12] Lockhart *et al.* showed that circulatory pressure changes in BP patients, especially diastolic hypertension, may disturb the

Table 2: Co-existing and pre-existing risk factors, diagnostic modalities and management of Bell’s palsy patients

Variable	Frequency and Percentage
Preexisting comorbidity	
Diabetes	29 (33)
Hypertension	27 (30.7)
Chronic Liver Disease	6 (6.7)
Chronic Kidney Disease	4 (4.5)
Pregnancy	4 (4.5)
Pre-existing Viral Infection	1 (1.1)
Pre-existing immunodeficiency	1 (1.1)
Coexisting comorbidity	
Pre-existing Cardiovascular Disease	5 (5.4)
Post or Coexisting Cardiovascular Diseases	2 (2.3)
Pre CAD-Specify	
CAD	4 (66.7)
Cardiomyopathy	1 (16.7)
MI	1 (16.7)
Post CAD Specify	
MI	3 (3.4)
Diagnostic Modality	
Neurological Examination	76 (87.4)
Lumbar Puncture	1 (1.1)
CT Scan	16 (18.4)
MRI	11 (12.6)
Electromyography (EMG)	3 (3.5)
Management	
Steroids	67 (76.1)
Antiviral	43 (48.9)
Eyedrops	34 (38.2)
Eye Coverage	15 (16.9)
Physiotherapy	26 (29.5)

CKD: Chronic kidney disease, MI: Myocardial infection, CAD: Coronary arterial disease, CT scan: Computed tomography scan, MRI: Magnetic resonance imaging, EMG: Electromyography

balance of the pressure system inside the facial canal, resulting in nerve damage.^[13]

Our study found 2.3% of patients with BP have co-existing or pre-existing cardiovascular disease. Similarly, Kim *et al.* found that those with BP are at increased risk for acute ischemic stroke; therefore, BP can be used as a prognostic indicator.^[14]

In our study, about 50% of patients diagnosed with BP have received combination therapy including antivirals and steroid treatment. The effectiveness of combination therapy for improving BP recovery is controversial. Two meta-analyses of randomized controlled did not show that combination therapy improves rates of complete recovery.^[15,16] Kim *et al.* showed that the combination of corticosteroids and antiviral medications for BP has little or no effect on complete recovery compared to corticosteroids alone. Somasundara *et al.*^[17] showed that there is no evidence supporting the use of combined antiviral medications with steroids.

On the other hand, network metanalysis has shown that combination therapy decreases the rates of unwanted contractions

of the muscles of the face during attempted movements.^[18] Lee *et al.* reported that the combination of corticosteroids and antiviral agents (prednisolone plus famciclovir) can result in better outcomes in severe cases of BP compared to using corticosteroids alone.^[13,19] Another study by Yong Kim showed that a combination of steroids and antiviral drugs is considered adequate and has a favorable recovery rate of 78% of Bell's palsy patients. Recent guidelines recommend that steroids are highly effective and can increase the likelihood of facial nerve recovery in patients with new-onset Bell's palsy. However, the combination of steroids with antiviral medications does not increase the probability of facial nerve recovery.^[6]

Bell palsy patients' recovery seems to be variable. In our study, 90% of patients recovered within 1 year. Several studies have shown that the recovery rate between 66% and 95% of patients who have Bell palsy will have a complete recovery within the first year.^[8,20] Peitersen *et al.*^[8] also showed that out of 2,500 patients, only 85% regained their normal function within 3 weeks, while the remaining 15% experienced recovery between 3 and 5 months. Additionally, in 71% of patients, normal mimical function was achieved. Anthony *et al.* showed that 71% of Bell's palsy patients have recovered with preserved facial function.^[21]

Bell's palsy might be misdiagnosed, especially when acute stroke is one of the top deferential. This might result in ordering unnecessary investigations and delaying the management.^[22] Our study showed that some of those patients who were diagnosed with Bell's palsy had been exposed to unnecessary investigations, such as 1% had a lumbar puncture, 18.4% had a CT scan, and 12.6% had an MRI [Table 2]. A study showed that out of 46 patients diagnosed with BP, 40 patients had undergone unnecessary neuroimaging and specialty review, which has led to in delay in initiating the treatment.^[22]

Conclusion

The incidence rate of BP is similar to the reported worldwide incidence rate. There appears to be a high use of antiviral medications, despite controversy around the use of antiviral in managing such cases. Studies have shown that the majority of patients with BP recover within the first year of the disease, which is also suggested by our study. This study highlights the need for local guidelines for BP to limit any discrepancy in the management.

What we already know

- The incidence rate of BP is common with an estimated rate of around 23 cases per 100,000 people.
- The exact etiology of BP is unknown; however it is believed to involve viruses, inflammation, or other causative factors.
- Steroid treatment is considered highly effective for improving the recovery rate of BP patients.
- The effectiveness of antiviral medications used alongside steroids for BP is debated.

- Most patients with BP have been shown to completely recover within the first year.

What this article adds

- The study aims to evaluate the characteristics of BP in a primary care setting, which is less explored compared to other settings.
- The study finds a high usage of antiviral medications for BP in this specific region, despite ongoing debate about their effectiveness.
- The study highlights the potential for unnecessary investigations into BP and emphasizes the need for clearer local guidelines for management.

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Conflicts of interest

There are no conflicts of interest.

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