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ORIGINAL RESEARCH

Report of 121 Cases of Bell's Palsy Referred to the Emergency Department

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Abstract

Introduction: According to the high incidence of Bell's palsy (IFP) and lack of clinical data regarding different aspects of disease, the present study investigated 121 Iranian patients with peripheral facial paralysis referred to the emergency department. **Methods:** In this retrospective study, all patients with peripheral facial paralysis, referred to the emergency department of Poursina hospital, Rasht, Iran, from August 2012 to August 2013, were enrolled. For all patients with diagnosis of Bell's palsy variables such as age, sex, occupation, clinical symptoms, comorbid disease, grade of paralysis, and the severity of the facial palsy were reviewed and analyzed using STATA version 11.0. **Results:** 121 patients with peripheral facial paralysis were assessed with a mean age of 47.14±18.45 years (52.9% male). The majority of patients were observed in the summer (37.2%) and autumn (33.1%) and the recurrence rate was 22.3%. The most common grades of nerve damage were IV and V based on House-Brackman grading scale (47.1%). Also, the most frequent signs and symptoms were ear pain (43.8%), taste disturbance (38.8%), hyperacusis (15.7%) and increased tearing (11.6%). There were not significant correlations between the severity of palsy with age (p= 0.08), recurrence rate (p=0.18), season (p=0.9), and comorbid disease including hypertension (p=0.18), diabetes (p=0.29), and hyperlipidemia (p=0.94). The patients with any of following symptoms such as ear pain (p<0.001), taste disturbance (p<0.001), increased tearing (p=0.03), and Hyperacusis (p<0.001) have more severe palsy. **Conclusion:** There was equal gender and occupational distribution, higher incidence in fourth decade of life, higher incidence in summer and autumn, higher grade of nerve damage (grade V and VI), and higher incidence of ear pain and taste disturbance in patients suffered from IFP. In addition, there was significant association between severity of nerve damage and presence of any simultaneous symptoms.

Key words: Bell palsy; facial nerve diseases; paralysis; epidemiology; peripheral neuropathy

Cite this article as: Zohrevandi B, Monsef Kasmaee V, Asadi P, Tajik H. Report of 121 cases of Bell's palsy referred to the emergency department. Emergency. 2014;2(2):66-70.

Introduction:

Bell´s palsy, or idiopathic facial paralysis (IFP), is defined as an acute peripheral palsy of seventh cranial nerve. It is one of the most common neurological disorders which usually manifests with facial weakness, ear pain, taste disturbance, hyperacusis, and increased tearing (1). The worldwide incidence of IFP is 11 to 40 per 100,000 people annually (2, 3). Its prevalence among males and females is more or less equal and its peak incidence is in the fourth decade of life (4-6). The occurrence of familial Bell´s palsy is about 14% and its recurrent risk is about 10% (7). Unilateral paralysis is the most common presentation of IFP occurs with the same frequency on the right and left sides of the face (4-6, 8). The most common causes of the abrupt onset of unilateral facial weakness are stroke and Bell´s palsy (9). Due to the close similarity between the symptoms of IFP and cerebrovascular accident, it is essential for emergency physicians to differentiate them (10, 11). Several risk factors can cause IFP including viral infection, vascular ischemia, autoimmune inflammatory disorders, age, hypertension, and heredity (11, 12). Controversies exist regarding the incidence of IFP and its relation with potential risk factors (13-17). Reports showed an increased incidence of IFP in the third and fourth decades of life and an increased rate of disease in colder months (autumn and winter) (15, 18). Besides, the findings of another study demonstrated the increase in the incidence of the IFP in the spring (13). Therefore, according to the high incidence of facial palsy and lack of clinical data regarding different aspects of disease, the present study investigated 121 Iranian patients with peripheral facial paralysis referred to the emergency department.

Methods:

A retrospective cross-sectional study was performed for patients with acute seventh nerve palsy referred to emergency department of Poursina Hospital, Rasht,

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Received: 2 March 2014; Accepted: 13 May 2014

Iran, from August 2012 to August 2013. Patients with facial palsy in both upper and lower parts of the face, examined by an emergency medicine specialist and then a neurologist, were included. Patients with seventh nerve palsy without involving the upper part of the face were excluded. Data collected from patients including gender, age, employment status, season of disease, affected side, clinical symptoms (such as severity of facial palsy, taste disturbance, ear pain and increased tearing), and comorbid disease (such as diabetes, hyperlipidemia, hypertension) were recorded in a specific datasheet. The clinical severity of the facial palsy was assessed using the House- Brackman (HB) grading scale (19, 20). The study was approved by the ethical committee of Gilan University of Medical Sciences.

Data were analyzed using STATA version 11.0. Mann-Whitney U and chi-square tests were used to compare the results and find a correlation between ordinal and nominal variables, respectively. Multinomial logistic regression was used to predict the probabilities of the possible differences among categories. Effects of season, age, gender, comorbid disease, and clinical factors on severity of paralysis were investigated using generalized linear poisson model and results were expressed as adjusted rate ratio (rr) and 95% confidence interval (95% CI). P-value <0.05 was considered as significant.

Results:

A total number of 121 patients with Bell´s palsy were studied (52.9% cases were male). The mean age of patients was 47.14±18.45 years (range: 16-81). Figure 1 shows the incidence rate of IFP in different age groups. The maximum incidence rate of IFP was in the fourth decade of patient's life (27.3%, p<0.007). Twenty-eight patients (23.1%) were self-employed and 14 (11.6%) ones farmers. Figure 2 demonstrates the seasonal incidence of IFP. The seasonal incidence of disease was significantly higher in summer (37.2%, p<0.001) and autumn (33.1%, p=0.002). Regarding the involved side, 63 patients suffered from IFP on the left side. Ninety-four cases (77.7%) experienced IFP for the first time (22.3% recurrence rate). The most frequent simultaneous symptoms with facial palsy were ear pain (43.8%), taste disturbance (38.8%), hyperacusis (15.7%), and increased tearing (11.6%) (p<0.001) (Table 1). Figure 3 demonstrated the percentage of different grades of nerve palsy. The most frequent grade of nerve damage based on HB grading scale was V grade (28.1%, p=0.001). Six (30%) men and 14 (70%) women suffered from VI degree of nerve palsy. The severity of palsy was higher in women (p<0.001). There were not significant correlations between the severities of palsy and age (p=0.08), recurrence rate (p=0.18), season (p=0.9), and comorbid disease including hypert ension (p=0.18), diabetes (p=0.29), and hyperlipidemia (p=0.94). The patients with any of following symptoms such as ear pain (p<0.001), taste disturbance (p<0.001), increased tearing (p=0.03), and Hyperacusis (p<0.001) have more severe palsy (Table 2). Multivariate analysis showed that presence of ear pain (rr=1.31; 95%Cl: 1.07-1.61; p=0.008), taste disturbance (rr=1.38; 95% Cl: 1.13-1.69; p=0.002), increased tearing (rr=1.39; 95%Cl: 1.07-1.80; p=0.01), and Hyperacusis (rr=1.41; 95%Cl: 1.14-1.76; p<0.001) were significantly associated with

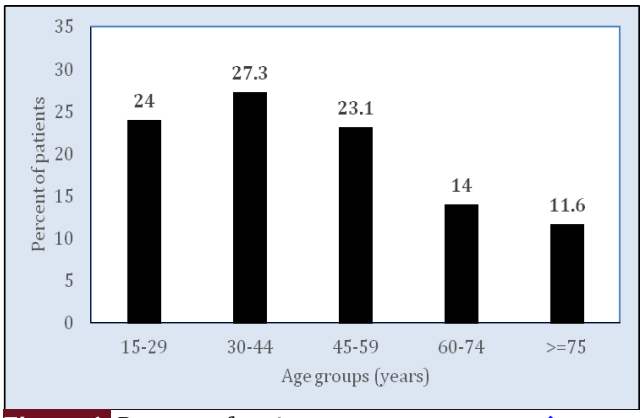

Figure 1: Percent of patient among age groups ⇧

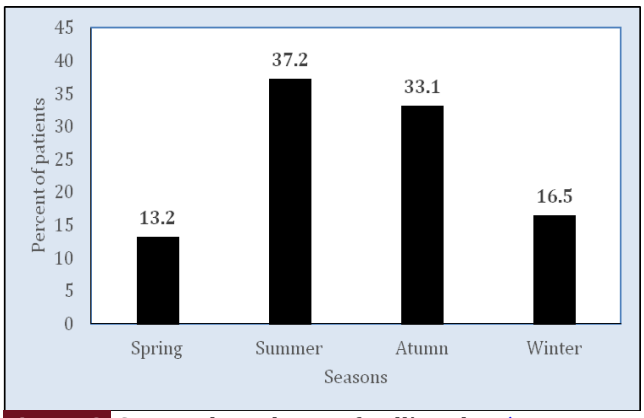

Figure 2: Seasonal incidence of Bell's palsy ⇧

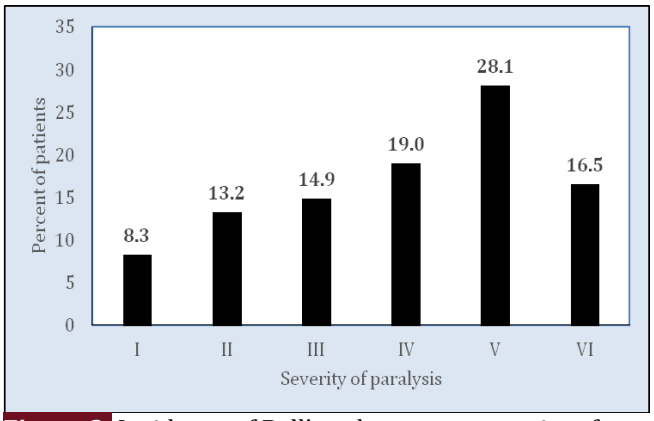

Figure 3: Incidence of Bell's palsy among severity of paralysis ⇧

Table 2: Baseline characteristics of patients with Bell's palsy who had referred to the ED

Variable	N (%)	P
Gender		
Male	64 (52.9)	ref
Female	57 (47.1)	0.525
Occupational status		
Self-employed	28 (23.1)	ref
Housekeeper	26 (21.5)	0.79
Employee	15(12.4)	0.05
Farmer	22 (18.2)	0.40
Construction worker	16 (13.2)	0.07
Other	14(11.6)	0.06
Comorbidity		
Hypertension	27 (22.3)	ref
Diabetes mellitus	23 (19.0)	0.57
Hyperlipidemia	25 (20.7)	0.78
Symptoms		
Ear pain	53 (43.8)	Ref
Taste disturbance	47 (38.8)	0.55
Increased tearing	14 (11.6)	<0.001
Hyperacusis	19 (15.7)	<0.001

Table 3: Relationship between demographic and clinical factors with severity of palsy (Univariate analysis)

Variable	Severity of paresis		P
	1-4	4-6	
Age (years)			
15-29	10 (34.5)	19 (56.5)	
30-44	22 (66.7)	11 (33.3)	
45-59	15 (53.6)	13 (46.4)	0.08
60-74	10 (58.8)	7 (41.2)	
>=70	10 (71.4)	4 (28.6)	
Gender			
Male	45 (70.3)	19 (29.7)	<0.001
female	22 (38.6)	35 (61.4)	
Times of refer			
First	49 (52.1)	45 (47.9)	0.18
Second	18 (66.7)	9 (33.3)	
Season			
Spring	8 (50.0)	8 (50.0)	
Summer	26 (57.8)	19 (42.2)	0.9
Autumn	23 (57.5)	17 (42.5)	
Winter	10 (50.0)	10 (50.0)	
Comorbidity			
Hypertension	18 (66.7)	9 (33.3)	0.18
Diabetes mellitus	15 (65.2)	8 (34.78)	0.29
Hyperlipidemia	14 (56.0)	11 (44.0)	0.94
Symptoms			
Ear pain	16 (30.2)	37 (69.8)	<0.001
Taste disturbance	13 (27.7)	34 (72.3)	<0.001
Increased tearing	4 (28.6)	10 (71.4)	0.03
Hyperacusis	2 (10.5)	17 (89.5)	<0.001

increase in severity of palsy (Table 3).

Discussion:

The main finding of the present study revealed the equal gender and occupational distribution, higher incidence of disease in fourth decade of life, significant higher incidence in summer and autumn, significant higher grades of nerve damage (grade V and VI), and finally significant higher incidence of ear pain and taste disturbance in IFP patients. In addition, there were significant association between the severity of nerve damage and presence of any simultaneous symptoms including ear pain, taste disturbance, increased tearing, and Hyperacusis.

Table 1: Association between demographic and clinical factors with severity of palsy (Multivariate analysis)

Variable	rr[a]	95% CI[b]	P
Age	1.01	0.94-1.09	0.70
Gender	1.16	0.96-1.38	0.12
Ear pain	1.31	1.07-1.61	0.008
Taste disturbance	1.38	1.13-1.69	<0.001
Increased tearing	1.39	1.07-1.8	0.01
Hyperacusis	1.41	1.14-1.76	<0.001

a: Adjusted risk ratio
b: Confidence interval

Bell´s palsy is the most common cause of facial paralysis that occurs incidentally with idiopathic etiology. It has been reported that there is a greatest incidence of IFP in Japanese and the Mexican population compared to the smallest incidence in the Swedish population (21). In a study carried out by Monini et al in Italy, it was reported that the age of peak incidence of IFP was 50 years and 53.7% of patients were male (22). In another study in Korea, Lee et al showed that the mean age of IFP was 47 years and 43.5% of patients with IFP were male (23). Savadi Oskouei et al showed the high incidence of IFP in 20-30 years patients and in cold seasons (18). The seasonal incidence of IFP has been discussed for many years. Previous studies have found higher incidence of Bell's palsy in autumn and winter, related to high prevalence of viral infection in the cold seasons (17, 24). Movahedian et al stated that the high incidence of IFP occurs in autumn and winter (15). Despite various studies on seasonal effects on IFP (16, 17, 25), the severity of seasonal effects of IFP in different areas and climate conditions are not well studied. In the present study, the most incidence of IFP has been observed in summer (37.2%) and autumn (33.1%) and fourth decade of life (30-44 years). Previous studies demonstrated that activation of the latent herpes viruses by ultraviolet could cause IFP. People, who are more susceptible to ultraviolet, including farmers, are at the higher risk of IFP. This hypothesis is supported by a study performed by Savadi Oskooi et al showed that 90% of patients referred at midsummer were farmer (18). This study showed that the most patients were self-employed (23.1%) and 18.2% farmers.

Recurrent IFP has been reported in different studies (26-30). Soltanzadeh et al estimated that 9% of patients

with IFP experienced the recurrence (31). In this study, recurrent IFP was observed in 22.3% of patients. In contrast to other studies, the higher recurrence rate observed in this study may be related to the lack of the patients' follow-up after the first recovery. In a research performed by Lee et al on IFP patients, it was shown that 63.3% of patients had a higher severity of nerve involvement (HB grade>IV) (23). According to the previous studies, it was found that 44.6% of IFP patients belonged to IV and V HB grades and only 21.5% of them had I and II grades.

The limitations of this investigation are that patients could not follow-up and the number of them was too small. This study recommends to design a greater prospective or case- control studies to recognize the related factors of IFP and confirm the data with a larger sample size.

Conclusion:

There was equal gender and occupational distribution, higher incidence in fourth decade of life, higher incidence in summer and autumn, higher grades of nerve damage (grade V and VI), and higher incidence of ear pain and taste disturbance in patients suffered from IFP. In addition, there was significant association between the severity of nerve damage and the presence of any simultaneous symptom.

Acknowledgments:

The authors appreciate the insightful cooperation of Medical Sciences and the staffs of the Emergency Department of Poursina Hospital in Rasht. We thank the patients and their families participated in this study.

Conflict of interest:

None

Funding support:

None

Authors' contributions:

All authors passed four criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors.

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