

Profile of facial palsy in Arar, northern Saudi Arabia

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Abstract

Background: The term facial palsy generally refers to weakness of the facial muscles, mainly resulting from temporary or permanent damage to the facial nerve. Common causes of facial paralysis include infection or inflammation of the facial nerve, head trauma, head or neck tumor, stroke.

Objective: To outline the incidence of several etiologies and the profile of patients with peripheral facial paralysis attending the outpatient clinic of the neurology department in Hospitals of Arar City, Saudi Arabia.

Methods: This cross-sectional study was carried out in Arar city from October 2016 to May 2017. The study was conducted in the outpatient clinic of the neurology department in hospitals of Arar City. Any ages of both sexes of all newly diagnosed unilateral facial palsy were included in the study. Data were analyzed by SPSS version 15, using descriptive statistics and Chi-square test. P-value was considered significant if <0.05

Results: The mean age of the facial palsy cases was 33.65 (± 11.71) years. Among the studied participants, the total prevalence of facial palsy was 26.3% (61% females and 39% males). The right side of the face was affected in 51.2% and the etiology was exposure to cold air current in 92.7% of cases. The treatment was physiotherapy in 80.5% of the cases, medical in 17.1% and surgical in 2.4%. There was significant relationship between smoking and the occurrence of facial palsy ($p < 0.05$).

Conclusion: The study revealed that facial palsy was common in Arar city. The rate is higher among males than females. We also concluded that exposure to cold air current was the main etiology. We recommend health education sittings to bring awareness to the public about the nature, causes, risk factors, prevention and treatment of the disease.

Keywords: Facial palsy; Etiology; Risk factors; Saudi Arabia; Incidence

1. Introduction

Facial paralysis is a loss of facial movement due to nerve damage. It can happen on one or both sides of the face. Facial paralysis can be caused by infection or inflammation of the facial nerve, head trauma, head or neck tumor and stroke. It can arise suddenly (as in the case of Bell's palsy) or it can gradually progress over a period of months (in the case of a head or neck tumor). Depending on the cause of paralysis, it can last for a short or prolonged period of time (1). It is relatively rare, with an annual incidence of approximately 30 per 100,000 individuals in a population (2), and it is characterized by inability to control the facial muscles of the affected side. Recently, there has been a growing number of studies which suggest that the origin of facial palsy is from the reactivation of Type 1 Simple Herpes Virus, which is concealed in the geniculate ganglion. Reactivation of the herpes zoster, which is latent in the geniculate ganglion, generally initiates the Ramsay Hunt Syndrome, in which acute facial paralysis occurs, followed by severe pain and vesicular eruptions of the external auditory meatus. Only 50% of patients suffering from this

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disease recover completely (3). Trauma, inflammatory affections of the middle ear, metabolic diseases and tumors are also common causes of facial palsy. Its symptoms may vary from mild to severe, and can include lethargy, muscle twitching, or complete loss of the ability to move one - or in rare cases, both sides of the face. Other symptoms include, loss of sensation in the anterior 2/3 of the tongue and drooping of the eyelid on the affected side of the face. Although the facial nerve innervates the stapedial muscles of the middle ear (via the tympanic branch), sound sensitivity, pain around the ear and dysacusis are hardly ever clinically evident. The acute otitis media may be present with the facial paralysis as a complication. The incidence is higher among children; however, the prognosis is fortunately very favorable and there is full recovery in most cases. Typically, symptoms come on over 48 hours. Age is a prognostic factor in patients with facial nerve paralysis. For example, age is inversely related to recovery rate (4, 5). Bell's palsy prognosis is fair, with total recovery in approximately 80% of cases, 15% go through permanent nerve damage and 5% remain with severe sequel (6). Most of the time (60% to 75%), the cause of Bell's palsy is idiopathic. Risk factors include diabetes and a recent upper respiratory tract infection, and other conditions that can cause facial weakness include brain tumor, stroke, Ramsay Hunt syndrome, and Lyme disease. It is caused by a dysfunction of the facial nerve (cranial nerve VII). As for its epidemiology, many studies have presented conflicting results. Most studies appoint comparison of its incidence in both sexes (7). It is suggested by some studies that the pathology is more frequent in young adults (8), but others have found a general increase in incidence with the aging (7). There are no routine lab or imaging tests required to make the diagnosis, once the facial paralysis sets in, many people may mistake it as a symptom of a stroke. However; the degree of nerve damage can be assessed using the House-Brackmann score. Facial palsy usually improves to recovery by itself and most patients achieve normal or near-normal function, although steroids have also been shown to be effective in improving recovery in the condition. Eye protective measures are required for those who are unable to close their eyes. Surgical treatment is not preferable in facial palsy cases and not widely performed. The objective of this work is to outline the incidence of several etiologies and the profile of patients with peripheral facial paralysis attending the outpatient clinic of the neurology department in hospitals of Arar city, KSA.

2. Material and Methods

A cross-sectional study of facial palsy frequency and fate was carried out on an Arar city population. The study was conducted in the outpatient clinic of the neurology department in hospitals of Arar city. The data was collected in the period from October 2016 through May 2017 by a well-constructed researcher-made questionnaire / checklist which included questions about all the needed data. We confirmed the validity and reliability of the checklist by conducting a pilot study to test the clarity of the questions. The ages of both sexes of all newly diagnosed unilateral facial palsy were included in the study in the data collection period. The written informed consent was obtained from each adult patient or child's guardian. We investigated the following clinical characteristics for all the patients: age, gender, side of spasm, the offending structures (the compressing vessels), and infection with herpes simplex virus. We also obtained detailed data about special habits, family history of hypertension, diabetes, similar condition and data of management, types and duration of diabetes. The filled questionnaires were reviewed for completeness and accuracy before data entry, then the data were compiled and analyzed using SPSS version 15 (SPSS Inc., Chicago, Illinois, USA) and results were analyzed with Chi-square test as appropriate, and are attributed and tabulated according to the study objective. P-value was considered significant if <0.05 . Our study was reviewed for seeking approval of the Research Ethics Committee of Faculty of Medicine, Northern Border University. Participants were informed that participation was completely voluntary. No name was recorded on the questionnaires and all questionnaires were kept safe.

3. Results

The questionnaire / checklist is shown in Table 1. In the period of October, 2016 through May, 2017, 156 patients attended, 41 (26.3%) patients were positive to facial palsy, 115 (73.7%) were negative. Table 2 shows the profile of the patients who presented with peripheral facial paralysis as for sex, age, educational level, marital status and BMI status. In total, 61% of the participants were females and 39% were males of different groups of age. Only 2.4% were more than 50 years of age, 9.8% were between 30 and 40 years old, 26.8% were 20-30 years old and 24.4 were under 30 years of age with 14 years old as a minimum. The majority of the patients (68.3%) were highly educated. A total of 63.4% of the patients were married and 31.7% were single. We also found that 46.3% of the participants were obese, and 4.9% were underweight. Table 3 illustrates the characteristics of facial palsy in the studied cases. It is clear from the table that facial palsy has sudden onset in 75.6% of the patients. The duration of the disease was one to two weeks in 12.2% of the patients, three to four weeks in 41.5%, five to eight weeks in 22% and more than twelve weeks in 12.1%. The percentage of affection of the right side was approximately equal to the left side (51.2% and 48.8 respectively). We found that 58.5% of the patients were not able to raise eyebrow. We also found that

92.7% of the cases were associated with exposure to cold air current, 34.1% were associated with loss of hearing and 24.4% were associated with otitis media. The treatment was physiotherapy in 80.5% of the cases, medical in 17.1% and surgical in 2.4%. Table 4 illustrates the relationship between facial palsy and socio-demographic characters and smoking status of the studied population. There was significant relationship between smoking and the occurrence of facial palsy ($p < 0.05$), while there is no significant relationship between occurrence of facial palsy and sex, marital status and educational level.

Table 1. The questionnaire / checklist used for data collection

Variables		
Socio-demographic characteristics	Sex	Female
		Male
	Age (year)	< 30
		30-40
		40-50
		≥ 50
		Educational level
	Secondary	
	University or more	
	Preparatory	
	Marital status	Divorced /Widow
		Single
		Married
BMI status	Underweight	
	Normal	
	Overweight	
	Obese	
Characters of facial palsy Onset	Gradual	
	Sudden	
Duration (in weeks)	1-2	
	3-4	
	5-8	
	>12	
Affected side	Left	
	Right	
Ability to raise eyebrow	No	
	Yes	
Etiology and associated conditions	Head trauma	
	Tick bite	
	Hypertension	
	Atrial fibrillation	
	DM	
	Stroke	
	Smoking	
	Otitis media	
	Exposure to cold air current	
	Herpes simplex infection	
	Associated with loss of hearing	
Treatment	Surgical	
	Medical	
	Physiotherapy	

Table 2. Socio-demographic characters of the studied cases, Arar, Saudi Arabia

Variables		n	%
Sex	Female	25	61.0
	Male	16	39.0
Age (year); Mean (\pm SD) 33.65 \pm 11.71	<30	15	24.4
	30-40	16	26.8
	40-50	9	9.8
	>50	5	2.4
Educational level	Primary	2	4.9
	Secondary	7	17.1
	University or more	28	68.3
	Preparatory	4	9.8
Marital status	Divorced /Widow	2	4.9
	Single	13	31.7
	Married	26	63.4
BMI status	Underweight	2	4.9
	Normal	11	26.8
	Overweight	9	22.0
	Obese	19	46.3

Table 3. Characteristics of facial palsy in the studied cases Arar, Saudi Arabia

Characters of facial palsy		n	%
Onset	Gradual	10	24.4
	Sudden	31	75.6
Duration (in weeks)	1-2	10	12.2
	3-4	17	41.5
	5-8	9	22.0
	>12	5	12.1
Affected side	Left	20	48.8
	Right	21	51.2
Ability to raise eyebrow	No	24	58.5
	Yes	17	41.5
Etiology and associated conditions	Head trauma	4	9.8
	Tick bite	1	2.4
	Hypertension	2	4.9
	Atrial fibrillation	1	2.4
	DM	5	12.2
	Stroke	4	9.8
	Smoking	7	17.1
	Otitis media	10	24.4
	Exposure to cold air current	38	92.7
	Herpes simplex infection	0	0.0
	Associated with loss of hearing	14	34.1
	Treatment	Surgical	1
Medical		7	17.1
Physiotherapy		33	80.5

Table 4. Relationship between Facial palsy and Sociodemographic characters and smoking status of the studied population, Arar, Saudi Arabia

Variables		Facial palsy		Total (n=156)	Chi-Square	p-value
		Yes (n=41)	No (n=115)			
Sex	Female	25	75	100	236	0.381
		61.0%	65.2%	64.1%		
	Male	16	40	56		
		39.0%	34.8%	35.9%		
Marital Status	Widow/divorced	2	7	9	0.461	0.794
		4.9%	6.1%	5.8%		
	Single	13	42	55		
		31.7%	36.5%	35.3%		
	Married	26	66	92		
		63.4%	57.4%	59.0%		
Educational level	Primary	2	2	4	4.561	0.335
		4.9%	1.7%	2.6%		
	Secondary	7	28	35		
		17.1%	24.3%	22.4%		
	University +	28	80	108		
		68.3%	69.6%	69.2%		
	Preparatory	0	1	1		
		0.0%	0.9%	0.6%		
	Illiterate	4	4	8		
		9.8%	3.5%	5.1%		
Smoking	No	34	91	125	15.67	0.028
		82.9%	79.1%	80.1%		
	Yes	7	24	31		
		17.1%	20.9%	19.8%		

4. Discussion

Since the facial nerve is rather complex for a cranial nerve, and they have a long intracranial course, in which the nerve takes three bends and passes through the narrow bony canal within the intra-temporal bone, they are more readily injured by middle ear or temporal bone surgery, trauma, infection, and compression caused by tumors in or within the vicinity of the nerves (9). The aim of this study is to outline the incidence of several etiologies and the profile of patients with peripheral facial paralysis in Arar city, Saudi Arabia. Bell's palsy is the most common cause of one sided facial nerve paralysis (70%). A study reported that it occurs in 1 to 4 per 10,000 people per year (10). It commonly occurs in people between ages 15 and 60. Commonly; males and females are affected equally (11). Different rates of incidence and prevalence have been reported around the world. Our study included 156 participants; the total prevalence of facial palsy was 26.3% (61% females and 39% males). This was relatively higher than findings of the study conducted in New York city which reported incidence of facial palsy (0.7%) as that reported by Hoffman and Cohen (12). The average annual incidence of Bell's palsy per 100,000 populations in Rochester, Minnesota, for 1968 through 1982 was 25.0 for both sexes combined (13). In a study with 3,454 patients, Schiatkin B. & May M. presented prevalence of Bell's palsy (48.3%) (14). Regarding age; in our study only 2.4% of the cases were more than 50 years of age, 9.8% were between 30 and 40 years old and the highest age group was 20-30 years old (26.8) (Mean \pm SD 33.65 \pm 11.71). A study in Nigeria (15) found that facial palsy was more prevalent among 20-34 years age group with a percentage of (40.3%). These findings are similar to that of several other studies (13, 16, 17, 18, 19). Many studies showed a similar increase in incidence with advancing age (13, 20, 21, 22). Our results show that both affected sides of the face (right and left) had almost similar ratios (51.2% and 48.8) respectively. Ayala Mejias et al. (23) confirmed prevalence on the left side of the face with 60% of the cases. This was close to the results of Nédio et al. which reported predominance on the right side, with 66.6% of the cases (24). Regarding associated conditions; 92.7% of the cases were associated with exposure to cold air current, 34.1% with loss of hearing, 24.4% Otitis media, 17.1% smoking and 12.2% with DM. In the Nédio et al. study; Bell's palsy was the most frequent etiology (53.7%), followed by traumatic (24%), Ramsay Hunt syndrome (9.2%), Cholesteatoma (5.5%), malignant otitis media (3.7% and acute otitis media (3.7%). In the Rodrigues R et al. study; 13.1% of infectious causes from which the study classifies as such: acute otitis media, chronic otitis media and Ramsay-

Hunt's Syndrome (25), while Schiatkin B & May M indicate only 4% (26). Idiopathic facial palsy (Bell's palsy) is the commonest cause of facial palsy and accounts for more than one third of all cases surveyed in the study of Lamina S et al. (15). A much higher incidence of idiopathic facial palsy was reported by Peitersen (27). Cerebrovascular accident (CVA) was the second most common cause of facial palsy in the Lamina S et al. study (15). However, otitis media was recorded in 76 (12.8%) cases of facial palsy in the study of Lamina S et al., which was consistent with the results by North Western University Medical School (28) that facial palsy is seldom caused by otitis media. In the study of Ysunza et al., incidence of facial palsy secondary to congenital cause was found to be much less common (29). In this study; 0.0% of the cases were associated with herpes infection. This was not in accordance with the results of the Sweeney and Gilden, (30) or Holland and Weiner (11) studies which reported high incidences of facial palsy due to herpes infection.

5. Limitations of the study

This study has number of limitations; firstly, the sample size was very small. Future research may be conducted in cosmopolitan cities such as Riyadh, Jeddah, and Dammam to ensure larger sample size for generalizability of results. Secondly, this study was conducted at the outpatient clinics in Arar city, KSA where the patient turnout was not very high. Future research may be conducted by including various medical compounds and centers from major cities of Saudi Arabia. Finally, the numbers of healthcare providing staff in the neurology clinics were less in number; this may be the reason that our results are not absolutely supporting/contradicting the literature.

6. Conclusions

The study revealed that facial palsy was common in Arar city. The incidence rate among those who attended the outpatient clinic of the neurology department in hospitals of Arar city was 55.5%. The incidence rate is higher among male patients than among females. We also concluded that exposure to cold air current was the main etiology in the studied cases. We recommend that, health policy makers implement health education sittings and campaigns to bring awareness to the public about the nature, causes, risk factors, prevention and treatment of the disease. We also recommend future detailed community based research specializing in facial palsy.

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Conflict of Interest:

There is no conflict of interest to be declared.

Authors' contributions:

All authors contributed to this project and article equally. All authors read and approved the final manuscript.

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