Arq Neuropsiquiatr 1997;55(4):722-727

CLUSTERS OF BELL'S PALSY

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ABSTRACT - The idiopathic facial paralysis or Bell's palsy installs abruptly or within a few hours, without any apparent cause. It corresponds to approximately 75% of all peripheral facial palsies. Three theories try to explain its pathogenecity: vascular-ischemic, viral and auto-immune. We reviewed the records of the EMG Sector, Hospital do Servidor Público Estadual (São Paulo, Brazil), from 1985 to 1995 and found 239 cases of Bell's palsy. Data were analysed according to age, gender, seasonal distribution of cases. There was a predominance of cases in the 31- 60 age bracket (40.59 %). The female gender was responsible to 70.71 % of cases. There was a predominance of cases in winter (31.38 %) and autumn (30.13 %), which was statiscally significant. These findings let us to suppose that Bell's palsy predominates in females, in 41-60 years age bracket, and occurs predominantly in cold months. There are groups of clusters throughout temporal distribution of cases and cases are dependent on one each other or on factors affecting them all, which reinforces the infectious hypothesis (there is a rise in the incidence of viral upper respiratory tract infection during cold months).

KEY WORDS: Bell's palsy, facial paralysis, electromyography, sazonality, epidemiology.

"Surtos" da paralisia de Bell

RESUMO - A paralisia facial idiopática ou paralisia de Bell se instala abruptamente ou em algumas horas, sem causa aparente. Corresponde a aproximadamente 75% de todos os casos de paralisia facial. Três teorias tentam explicar sua patogenia: vásculo-isquêmica, autoimune e viral. Nós revisamos os arquivos do Setor de Eletromiografia do Hospital do Servidor Público Estadual (São Paulo) de 1985 a 1995, encontrando 239 casos de paralisia de Bell. Dados foram analisados quanto a idade, sexo, distribuição sazonal. Houve predominância dos casos na faixa etária de 31 a 60 anos (40,59 %). O sexo feminino foi responsável por 70,71 % dos casos. Houve predominância de casos no inverno (31,38 %) e outono (30,13 %), estatisticamente significante. Estes achados levam-nos a supor que a paralisia de Bell predomina nas mulheres, entre 41- 60 anos, ocorre predominantemente nos meses frios. Há aglutinação de casos na distribuição temporal e dependência dos casos, entre si ou a fatores comuns, o que fala a favor da hipótese infecciosa (há aumento da incidência de infecções virais do trato respiratório superior durante os meses frios).

PALAVRAS-CHAVE: paralisia de Bell, paralisia do nervo facial, eletromiografia, sazonalidade, epidemiologia.

Since Sir Charles Bell, in 1821, established that facial expression muscles were not related to a branch of trigeminal nerve, attributing it to the facial nerve, his name has been associated to most cases of facial paralysis. Nowadays, most authors use this term to refer to idiopathic facial palsy[3]. Bell's palsy installs abruptly or within a few hours, without any apparent cause[2], mostly unilaterally affecting the seventh cranial nerve, and usually referred to idiopathic peripheral facial palsy[2,6]. Three major theories try to explain its pathogenecity: vascular-ischemic, viral and auto-immune[2,3]. We

This study is part of the Dissertation (Intern Program) presented on July, 1997 at Hospital do Servidor Público Estadual (HSPE/FMO), São Paulo, Electromyography (EMG) Sector, Department of Neurology: *Medicine student, Federal University of Paraíba Campus II, Intern HSPE/FMO; **Medicine student, Federal University of Maranhão, Intern HSPE/FMO; ***Neurologist, EMG Sector Director, HSPE/FMO. Aceite: 25-agosto-1997.

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analysed the records on Bell's palsy of the EMG Sector, Department of Neurology, HSPE/FMO, from 1985 to 1995, and classified them according to sex, age, seasonal distribution of cases, discussing its possible pathogenesis.

MATERIAL AND METHODS

For this study we reviewed all data from the medical records of the EMG Sector, Department of Neurology, HSPE/FMO, from 1985 to 1995. Patients electromyographically diagnosed as having facial palsy were selected and classified according to gender, age, date at which paralysis occurred. In this group, those with congenital or traumatic facial paralysis, patients with central facial paralysis, those whose palsy occurred before the survey period, without a precise date palsy occurred or without precise age were excluded. Also, those patients who presented with facial palsy following surgery of face, ear or brain were excluded.

We divided the age into three groups: young (0 - 30 years of age), median (31 - 60 years old) and elder (61 years or more) ages. All patients were then arranged in order of dates of occurrence of facial paralysis, and the intervals between successive cases were calculated, being presented in a linear time scale (when two or more cases occurred on the same day, it was considered a zero day- interval). The year was divided according to seasons and, then, divided into two six-month periods: the "warm" period (September - February) and the "cold" period (March - August). We used the Poisson distribution to determine whether or not cases were epidemically distributed.

RESULTS

During the 11-year period of the survey, 239 patients with idiopathic peripheral facial palsy were diagnosed at the EMG Sector, HSPE/FMO. Of these 239 patients, 70 were male and 169 (70.71%) were female (Table 1).

Table 2 presents the age-bracket distribution of cases. Cases were distributed into three age brackets. The young age was responsible to 73 cases; median age, 97; elder age, 69 cases (respectively, 30.54 %; 40.59 % and 28.87 %). Cases were distributed according to months of occurrence, as shown in Figure 1. The largest number of cases occurred along the months of March, April, June and August. Considering that winter season begins on June and finishes on August, the peak incidence occurred during this season (75 cases). From March to May, 72 cases occurred, during which autumn season happens, as it can be seen in Table 3. They both represented 61.51% of cases. If summer and spring cases were grouped together, they would represent 38.49 % of all cases.

Table 1. Distribution of cases according to gender.

Sex	No.	%
Male	70	29.29
Female	169	70.71
Total	239	100

Table 2. Distribution of cases according to age.

Age	No.	%
0-30	73	30.54
31 - 60	97	40.59
61 - +	69	28.87
Total	239	100

Analysis of cases by age and 6-month period is shown in Table 4. It demonstrates that there was a predominance of cases during the "cold" season, from March to August, in all age brackets. It also shows that cases occurred homogenously throughout all age brackets, with a predominance between 31-60 years of age.

Two hundred and thirty-nine cases of Bell's palsy occurred during the 11-year period of analysis, representing 4016 days. The mean interval between two consecutive cases is 16.80. Figure 2 presents temporal distribution of cases. It would be expected that cases would occur around the mean value of 16.8 days. According to Poisson distribution, as it would be expected if Bell's palsy cases were independent one from another, the lengths of intervals would have an exponential distribution with a mean of 16.8 days.

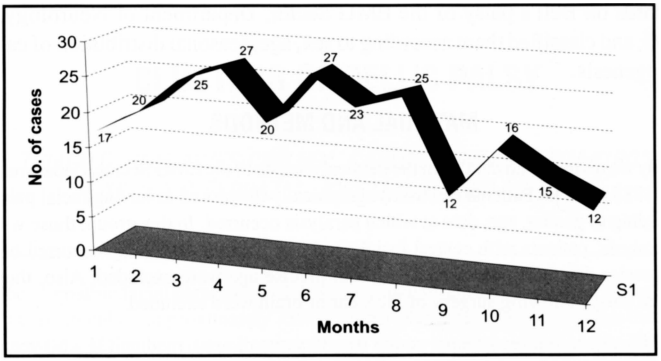

Fig 1. Distribution of cases (1985-1995) - HSPE/FMO.

Table 3. Distribution of cases according to seasons (1985–1995).

Summer Dec-Feb		Autumn Mar-May		Winter Jun-Aug		Spring Sep-Nov	
No.	%	No.	%	No.	%	No.	%
48	20.08	72	30.15	75	31.38	44	18.41

Table 4. Bell's Palsy: age vs. 6-months period.

	March-Ausgust		September-February		Total	
Age	No.	%	No.	%	No.	%
0-30	50	68.49	23	31.51	73	29.71
31-60	57	58.76	40	41.28	97	40.59
61-+	40	57.97	29	42.73	69	28.87
Total	147	61.51	92	38.49	239	100.0

Table 5. Distribution of 239 cases according to successive cases intervals.

Intervals	Cases number	Intervals	Cases number	Intervals	Cases number
0	11	19	5	42	1
1	20	20	5	43	1
2	18	21	2	45	1
3	11	22	2	46	1
4	17	23	2	49	1
5	9	24	2	52	1
6	13	25	2	56	1
7	13	26	1	58	1
8	5	27	1	60	1
9	9	28	2	61	1
10	7	29	4	62	1
11	5	30	2	63	1
12	9	31	2	64	1
13	4	33	1	77	1
14	6	35	2	87	1
15	6	38	1	88	1
16	3	39	1	100	1
17	4	40	1	133	1
18	6	41	1	191	1

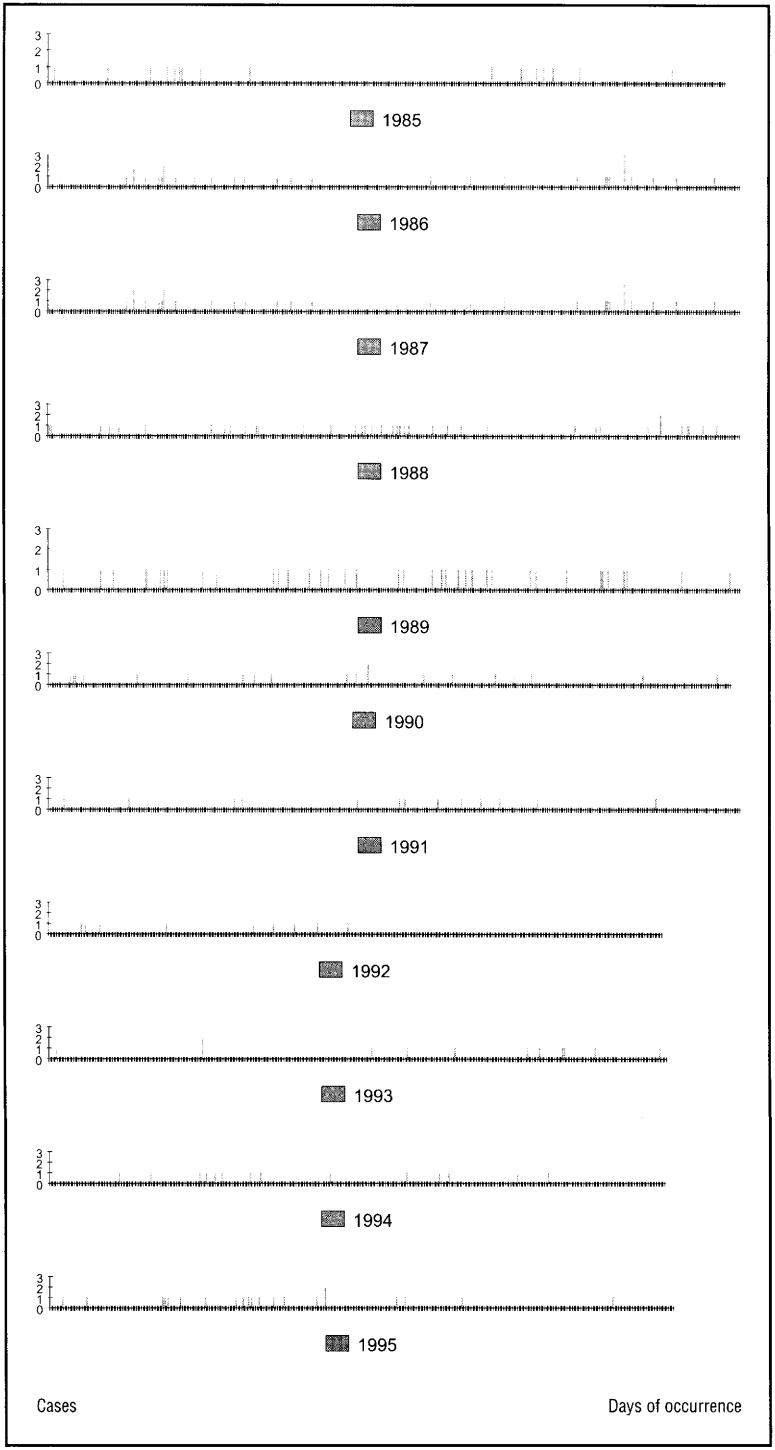

Figure 2. Temporal distribution of cases.

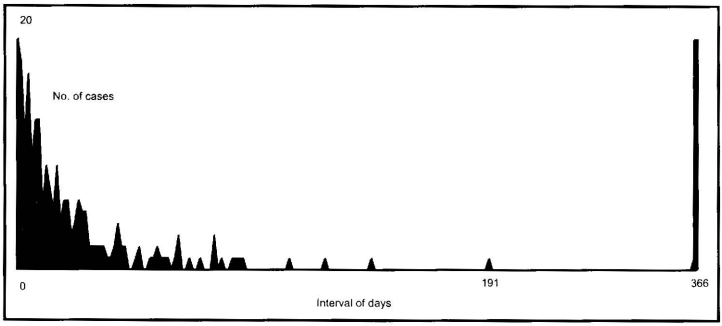

Fig 3. Interval of successive cases.

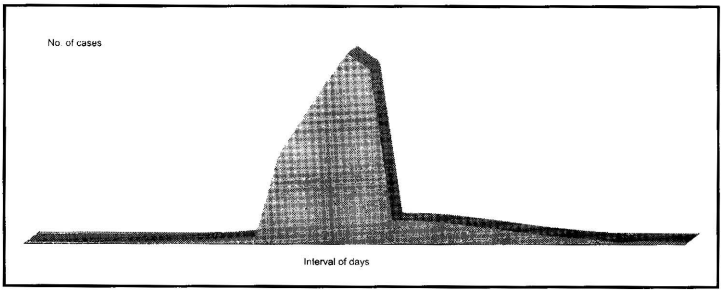

Fig 4. Poisson distribution.

Table 5 shows the distribution of 239 intervals between successive cases, grouped by length of interval in days. It differs significantly from the expected exponential distribution, which rejects the independence of cases. Figure 3 shows cases distributed according to intervals of successive days. Figure 4 shows cases distributed according to a Poisson process.

DISCUSSION

This study tries to characterize aspects related to the epidemiology of Bell's palsy in our service, classifying findings according to seasonal distribution, independence of consecutive cases, sex and age distribution. It uses the same methodology that Leibowitz[8], discussed later on.

There is no consensus about sex predominance of Bell's palsy. Fortes-Rêgo[4] affirms that some authors demonstrated that females around 10 to 19 years old are more susceptible to Bell's palsy than boys at the same age. Testa and Fukuda[10], found a female predominance of cases and affirmed that this happened because of female predominance in the general population sample studied.

The present study demonstrates a predominance of Bell's palsy in female, representing 70.71% of cases. This may reflect the female predominance in population assisted by HSPE/FMO.

Hauser et al.[6] in Rochester (Minnesota, USA) demonstrated a difference of incidence with age, showing a lower rate in the young and higher in adults. Almeida[2] in Petropolis (Rio de Janeiro, Brazil) observed predominance of cases in the third decade of life. We found 40.59 % of cases occurring between 31 and 60 years of age.

Testa and Fukuda[10] and Hauser et al.[6] did not demonstrate sazonality. Almeida[2] reported an increased incidence in the end of winter and in the beginning of spring. Leibowitz[7] found an increased occurrence of cases in cold months in younger age groups, and in warm months a predominance of cases in the older patients. We found a predominance of cases in autumn and winter, the " cold" months of the year, in all age groups. The difference between autumn and winter was not statiscally significant.

The Poisson distribution can be used to determine the probability of events to occur a specified number of times, demonstrating the independence of consecutive cases. In our series, to be according to Poisson process, cases intervals should be around 16.8 days. We demonstrated that our observed distribution differs from the expected exponential distribution, suggesting that these cases are not independently distributed; it means they are dependent either on each other, or on factors affecting them all. Also, it is noted groups of clusters throughout temporal distribution of cases. This demonstrates clusters rather than uniform density of cases.

Frumkim et al.[5] in Atlanta (Georgia, USA) showed a possible cluster of cases in a workplace, but affirmed that cases represented a chance occurrence, attributing to possible bias and low statistical power. Adour and Wingerd[1] in Oakland (California, USA) were not able to demonstrate epidemicity of cases and no significant difference was seen in the number of cases occuring during the warm and the cold seasons. Buzelle and Alonso-Nieto[3], studying 433, cases in this same hospital, classsified their findings according to sex, age, and months of occurrence, concluding that cases occurred most frequently in January and from May to August, correlating them to infectious diseases that more frequently occur in "cold"months. In January, higher incidence would occur mostly because of agglutination of persons during this vacation period. There was no statistical predominance of cases in this series. Leibowitz[8], studying 499 cases of Bell's palsy in Hadassah University Hospital (Jerusalem, Israel) from 1955 to 1964, demonstrated clusters in temporal distribution of cases, affirming that it represented an epidemically distributed disease, supporting a viral-infectious aetiology to Bell's palsy. Our findings are in agreement with Leibowitz's[8].

Two main theories try to explain Bell's palsy pathogenesis[4]: a. vascular-ischemic: a vasospasm would cause an ischemia following venous stasis and oedema of the facial nerve in the facial channel; this would cause secondary ischemia, creating a feedback and consequently entrapment of the nerve; and b. infectious: some authors demonstrate signs and simptoms of prodromic phase of "viral-like syndrome"; others exhibited antibodies to Herpes simplex; still, others affirm an epidemic distribution of cases.

According to Pereira et al.[9], most cases of viral infection of upper respiratory tract occur in the winter months, with a peak incidence on August, which may corroborate the infectious hypothesis.

In conclusion, Bell's palsy seems to occur more frequently in "cold" months of the year representing a sazonality. It can be associated with an infectious ethiology, mostly because: 1. there are groups of agglutination of cases throughout temporal distribution of cases; 2. cases seems to occur dependently one to each other or to factors that affect them all; 3. its higher incidence period coincides with higher incidence period of upper respiratory tract viral infections.

Acknowledgements - We would like to thank to Prof. Dr. Luís dos Ramos Machado, for the statistical methodology orientation. We dedicate this study to the memory of Mrs. Eunice Diniz Coêlho.

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