นิพนธ์ต้นฉบับ

Clinical characteristics of Bell's palsy: a retrospective study of 978 cases in Songklanagarind Hospital

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Abstract:

Clinical characteristics of Bell's palsy: a retrospective study of 978 cases in Songklanagarind Hospital

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Objectives: *To study the clinical characteristics of patients with Bell's palsy.*

Designs: *Retrospective, descriptive and hospital-based studies of medical records.*

Materials and Methods: *A retrospective review of 1,132 medical records of facial palsy diagnosed from January 1997 to December 2001 was performed. We selected 978 cases (910 adult and 68 pediatric cases) in whom Bell's palsy was the final diagnosis for analysis of their clinical characteristics and the correlation among them.*

Results: *There were 438 (44.8%) male and 540 (55.2%) female cases. The mean age of onset was 44.62 (range 2-87, SD 19.19). No significant differences in mean age of onset between the sexes or prevalence among seasons was found. There was no significant difference between the sides of face involved. There were 42 cases (4.3%) with recurrent episodes in which female patients were significantly more likely to have recurrence (p=.005). Either side of face could be involved in the recurrent episode with nearly equal chance. Primigravidity, the third trimester of gestation and immediate post partum period were the conditions commonly found in pregnancy associated with Bell's palsy. Diabetes mellitus and hypertension were found in 4.9% and 5.7% respectively. No significant association between each clinical characteristic and either disease was established, except for a higher mean age of onset in diabetics, hypertensive and combined groups. There was no significant difference in patients' characteristics between the 68 pediatric cases and the adult group, but chronic otological infection was more commonly found in the former.*

Conclusion: *There was no significant difference in clinical characteristics between adult and pediatric groups. No predilection for the side of face was found. There was no variability in seasonal prevalence in the involvement of Bell's palsy. No definite association between any clinical characteristic and diabetes mellitus or hypertension was found. For pregnant women, it was commonly found during the third trimester of gestation and immediate post-partum period. The overall recurrence rate was 4.3%. Both sides of the face could be affected in the recurrence similarly.*

Key words: *Bell's palsy, clinical characteristics*

บทคัดย่อ:

วัตถุประสงค์: *เพื่อศึกษาลักษณะทางคลินิกของผู้ป่วยโรคอัมพาตเบลล์*

รูปแบบการศึกษา: *แบบย้อนหลังโดยศึกษาจากเวชระเบียนผู้ป่วย*

วัสดุและวิธีการ: *จากการทบทวนเวชระเบียนผู้ป่วยทั้งผู้ป่วยในและนอกที่เข้ารับการรักษาระหว่างเดือนมกราคม พ.ศ. 2540 ถึง เดือนธันวาคม พ.ศ. 2544 มีผู้ป่วยที่ได้รับการวินิจฉัยว่าเป็นอัมพาตของใบหน้าครึ่งซีก จำนวน 1,132 ราย จากจำนวนผู้ป่วยดังกล่าว คณะผู้ศึกษาคัดเลือกผู้ป่วยที่ได้รับการวินิจฉัยว่าเป็นอัมพาตเบลล์ จำนวน 978 ราย เป็นผู้ใหญ่ 910 ราย และเด็ก 68 ราย ได้มีการวิเคราะห์หาความสัมพันธ์ระหว่างตัวแปรทางคลินิกต่าง ๆ ที่รวบรวมได้*

ผลการศึกษา: *จากจำนวนผู้ป่วยทั้งหมด มีผู้ป่วยชาย 438 ราย (ร้อยละ 44.8) หญิง 540 ราย (ร้อยละ 55.2) อายุเฉลี่ยของการเกิดอาการคือ 44.62 ปี (ช่วง 2-87 ปี, SD. = 19.19) ไม่พบความแตกต่างอย่างมีนัยสำคัญทางสถิติในอายุเฉลี่ยและฤดูกาลที่เกิดโรค ไม่พบความแตกต่างในการเกิดโรคระหว่างใบหน้าทั้งสองข้าง มีผู้ป่วย 42 ราย (ร้อยละ 4.3) เกิดอาการกลับเป็นซ้ำ ซึ่งพบว่าผู้หญิงมีโอกาสกลับเป็นซ้ำมากกว่าผู้ชายอย่างมีนัยสำคัญทางสถิติ (p = .005) และใบหน้าทั้งสองข้างมีโอกาสกลับเป็นซ้ำได้ใกล้เคียงกัน ในสตรีตั้งครรภ์จะพบภาวะดังกล่าวชุกในช่วงไตรมาสที่สามและหลังคลอด รวมทั้งยังพบบ่อยในครรภ์แรก พบโรคเบาหวานและความดันโลหิตสูงเกิดร่วมด้วย ร้อยละ 4.9 และ 5.7 ตามลำดับ ไม่พบว่ามีความสัมพันธ์ระหว่างโรคดังกล่าวทั้งสองกับตัวแปรลักษณะทางคลินิก ยกเว้นอายุเฉลี่ยขณะเกิดอาการจะสูงกว่าผู้ป่วยที่ไม่มีโรคดังกล่าว ในกลุ่มผู้ป่วยเด็ก 68 ราย ก็ไม่พบลักษณะทางคลินิกที่แตกต่างไปจากผู้ใหญ่ เพียงแต่พบว่ามีอัตราการติดเชื้อของช่องหูมากกว่าผู้ใหญ่*

สรุป: *ไม่พบความแตกต่างของลักษณะทางคลินิกของอัมพาตเบลล์ระหว่างกลุ่มผู้ป่วยเด็กและผู้ใหญ่ โรคนี้พบบนใบหน้าทั้งสองซีกได้โดยไม่แตกต่างกัน ไม่พบความแตกต่างของฤดูกาลในการเกิดโรค และไม่พบความสัมพันธ์ระหว่างตัวแปรลักษณะทางคลินิกแต่ละตัวกับโรคเบาหวานหรือความดันโลหิตสูง ในสตรีตั้งครรภ์จะพบโรคนี้มากในช่วงไตรมาสที่ 3 และระยะแรกหลังคลอด โรคนี้มีอัตราการกลับเป็นซ้ำโดยรวม ร้อยละ 4.3 การกลับเป็นซ้ำมีโอกาสเกิดบนใบหน้าทั้งสองข้างได้ใกล้เคียงกัน*

คำสำคัญ: *อัมพาตเบลล์, ลักษณะทางคลินิก*

Introduction

Bell's palsy or idiopathic facial neuropathy is the most common facial nerve disorder found in clinical practices. May[1] revealed 57% of 1,575 cases of facial palsy in his retrospective review study were Bell's palsy. There were no significant predilection for age, sex, season or side of face in the involvement.[2] However, there has been no detailed epidemiological study of Bell's palsy in Thailand. This study aimed to describe the patients' characteristics, clinical profiles and nature of Bell's palsy in the southern Thai population by a retrospective review in a university hospital-based study.

Materials and methods

All cases of facial neuropathy diagnosed from January 1997 to December 2001 were reviewed from medical records with the permission of the ethics committee of Faculty of Medicine, Prince of Songkla University. Cases diagnosed as Bell's palsy among them were selected for analysis in this study. The data collected were: age, sex, side of face involved, number of episodes of facial palsy, the side of face involved in recurrent episodes, interval between the first episode and the recurrence, duration from the onset of facial paralysis to attendance, the month of onset, and associated diseases or conditions accompanying the onset of facial paralysis. Pregnant women with the disorder were also included in this study. The diagnosis of Bell's palsy was based on clinical information which included acute onset and non-progressive course of isolated lower motor neuron-type facial paralysis. There had to be no evidence of intracranial or systemic tumors, rhino-otological or systemic infection, severe head injury, post neurological or otological surgery, congenital anomalies or maldevelopment of cranio-facial structures, and also no other clinical symptoms and signs suggesting systemic infection or malignancy (eg., prolonged fever, lymphadenopathy, hepatosplenomegaly and weight loss etc.). All of the patients had to have normal routine blood tests, serological studies for syphilis and HIV, and chest radiography which were usually performed in the initial evaluation of the disorder. Further special tests, when indicated by the clinical clues, had to reveal no abnormalities too. Percentage, mean and standard deviation were used for analysis of demographic data. Student t-test and ANOVA were used for detection of the difference in mean age of onset. Chi-square was used for testing association between clinical characteristics and associated diseases.

Results

There were 1,132 cases of all causes of facial palsy identified from the medical records during the study period. The causes of facial palsy were shown in Table 1. Among them idiopathic facial neuropathy or Bell's palsy was the most common cause found (978 cases, 86.4 %). Cases with traumatic causes (6.5%) and herpes zoster infection of head and neck (3.8%) were the second and third most common causes respectively. Intracranial tumors were found in six cases (0.6%) and all of them were cerebellopontine angle tumor. Chronic otological infection was found in 7 cases. Positive serological test for HIV infection were identified in 4 cases (0.4%).

Table 1 Causes of facial palsy

Causes	Number of cases (%)
Idiopathic (Bell's palsy)	978 (86.4)
Trauma	65 (6.6)
Herpes zoster infection	37 (3.8)
Chronic otological infection	7 (0.7)
Intracranial tumor	6 (0.6)
HIV positive	4 (0.4)
Others	35 (3.6)

There were 438 males and 540 females patients making up 44.8% versus 55.2% of all cases (Table 2). The overall mean age of the onset of Bell's palsy in this study was 44.62 years (range 2-87, SD 19.19). It was 46.16 (SD = 19.21) in the female group, and 44.41 (SD = 18.78) in the male group. This slightly higher mean age of the onset in the female patients was not statistically significant by t-test (p = .152). The common age of onset of the overall group was 20-69 years old without significant difference of distribution between the sexes.

Table 2 Characteristics of patients with Bell's palsy (978 cases)

Characteristics	Total	Male	Female
Number (%)	978	438 (44.8)	540 (55.2)
Mean age of onset, year (SD)		44.41 (18.78)	46.16 (19.21)
Side of face involved			
- right	502	209 (47.7)	293 (54.3)
- left	468	226 (51.6)	242 (44.8)
- bilateral	8	3 (0.7)	5 (0.9)
Single episode	936	428 (97.8)	508 (94.1)
Recurrence	42	10 (2.2)	32 (5.9)*

* There was significant difference in recurrence between males and females (chi-square = 7.808, p = .005).

Most of the patients visited the outpatient department of internal medicine or general practice or otolaryngology within the first week of the onset (95%). There was no significant difference in prevalence of cases in any month of the year.

There were 502 cases with right facial involvement (51.3%), 468 cases with left facial involvement (47.9%) and 8 cases with bilateral silmutaneous facial involvement (0.8%) (Table 2).

We found 42 cases (4.3%) with recurrent Bell's palsy among whom 41 cases had two episodes of the disorder and one case had three (Table 3). The average age of onset in the recurrent group was 46.24 years (SD = 17.55) compared with 45.34 years (SD = 19.10) in the non-recurrent group. Female patients were significantly more likely to have a recurrent attack (p = .005). Most of the recurrent episodes took place more than 12 months after the first one (37 cases). Both ipsilateral and contralateral side could be affected in the recurrence without significant difference (23 vs 19 cases).

There were 17 cases of Bell's palsy developed during pregnancy and post partum period. Most of them experienced the disorder during the third trimester (6 cases) and immediate post partum period (6 cases). Only two and three cases were found during the first and the second trimester respectively. The majority of the pregnant women in this study were primigravid pregnancy (12 cases). The rest were three cases for the second gravidity, one case for the third gravidity and another one case for more than the fourth gravidity.

A total number of 79 pediatric cases of facial palsy (age below 15 years) were also included in this study, of whom 68 (86.1%) were diagnosed as Bell's palsy. Among them, 40 cases (58.8%) were female and 28 cases (41.2%) were male. We found right facial involvement in 48 cases. Left facial involvement was found in 18 cases and bilateral facial involvement in 2 cases. The other common causes associated with facial palsy in this age group were chronic otological infection and trauma (5 cases in each cause) only one case was associated with herpes zoster infection of head and neck.

Table 3 The recurrent Bell's palsy

Variables	Number of cases
Total cases of recurrence	42
Single recurrence (2 episodes)	41
Multiple recurrence (3 episodes)	1
Side of recurrence	
-ipsilateral	23
-contralateral	19
Duration between the initial and the second episode	
< 1 month	1
1-6 months	2
> 6-12 months	2
> 12 months	37

Table 4 Correlation between some variables and associated diseases.

Variables	Associated diseases			
	None	DM	HT	DM & HT
Total cases (%)	813 (83.1)	56 (5.7)	64 (6.5)	28 (2.8)
Sex				
male	382	19	30	7
female	431	37	34	21*
Episode				
first	783	51	59	26
recurrent	30	5	5	2
Mean age of onset, year (SD)	43.05 (18.9)	58.25 (10.4)#	59.73 (13.6)#	64.30 (7.4)#
Side of face involved				
right	421	29	34	8
left	385	26	30	20**
bilateral	7	1	0	0

There was significant difference in mean age of onset in each associated disease group compared with no associated disease group (F = 32.4, p < .001).

* Female patients were significantly more frequent in the DM&HT group (chi-square = 5.3, p = .022) compared with the no associated disease group.

** Left side were significantly more frequently involved in the DM&HT group (chi-square = 6.36, p = .041) compared with the no associated disease group.

There were 56 cases (5.7%) and 64 cases (6.5%) of all patients diagnosed as Bell's palsy associated with diabetes mellitus and hypertension respectively. Association with both diseases was seen in 2.8% (Table 4). The mean age of onset of the patients who had diabetes mellitus was 58.25 years (SD = 10.4), that of patients with hypertension 59.73 years (SD = 13.6) and that of patients with both the diseases 64.30 years (SD = 7.4). All of these were significantly higher than the mean age of the group with no associated disease. However, there was no significant association between sexes, number of episodes of attack, or side of face involved and each of the disease. On the contrary, there was significant involvement of female (p = .022) and predilection for the left side (p = .041) in those who had both associated diseases.

Discussion

Among the 1,132 cases of facial palsy, 978 cases met the criteria for diagnosis of Bell's palsy (81.4%). It was the most common cause of acute lower motor neuron-type facial neuropathy in clinical practice as has been demonstrated in the literature.[1,3] The pathophysiology of the disorder is not clearly understood; however, reactivation of herpes viral infection has been widely accepted.[4-6] It was proposed that the virus has lived latently in the geniculate ganglions of the facial nerves, and then, by some precipitating factors, eg. common viral infection, trivial head injury, psychological stress, dental procedures, pregnancy, or immuno-compromised state, the virus is reactivated and causes facial neuropathy. Among all patients with facial palsy, there were only six cases found to be

cerebellopontine angle tumor (0.6%) and seven cases of chronic otological infection (0.7%) of which five cases were in the pediatric group. Positive serological test for HIV was found in only four cases (0.4%). However, because of the limitation of the study design, this may be lower than expected. Usually, facial neuropathy in HIV-infected patients develops during the seroconversion phase of the infection, in a clinical setting of aseptic meningitis. This may be another reason for low rate of positive serological test.

There were slightly more female patients included in this review and their mean age of onset was higher than that of males, but the difference was not statistically significant. The common age of onset ranged from 20 to 69 years without significant difference in the distribution of cases between both sexes. Devriese et al.[2] found the common age of onset of Bell's palsy ranged from 20 to 39 years with a bimodal distribution in the female group. Yanagihara et al.[7] reported the common age of onset of Japanese patients with Bell's palsy ranged from 20 to 59 years, which is comparable with the findings of this study. Therefore, the disorder can involve both sexes nearly equally and at nearly the same average age of onset. Also, there was no difference in the incidence of the disorder in each period of age between the sexes (stratified into ten-year intervals eg. 0-9,10-19...etc.).

No significant seasonal clustering of the cases was found. However, some authors reported that a slightly higher prevalence of cases were observed during the rainy season.[1-3, 8-10] This may be due to the association between viral infection as a precipitating factor and Bell's palsy. Most of the cases came to seek medical care early in the course of their illness (within 7 days of the onset). The cosmetic embarrassment from disfiguring facial expression and the fear of becoming hemiplegic as in the case of cerebrovascular diseases were the major reasons for early attendance. Since oral prednisolone therapy within the first week of the illness yielded the favorable outcome,[11] this was a good opportunity for better recovery if prednisolone was prescribed as early as their first visit when it was without contraindications.

There was no significant predominance in the side of the face involved in Bell's palsy in the overall group. Side of face has been reported to have no clinical significance for recovery of Bell's palsy.[12] Some previous population-based studies revealed no difference in the side of facial involvement in regard to sex and age group of onset as well.[2, 8, 10, 11]

There were 42 cases with recurrent Bell's palsy. Most of them experienced the second attack at more than one year after the first onset. Either side of the face could be affected during the recurrence with equal chance. Female patients had higher rate of recurrence in this study (Table 2). The rate of recurrence has been reported to be varied from 0.5 to 10.4% in various studies.[2, 7, 13, 14]

The association between recurrence and diabetes mellitus and hypertension was not demonstrated in this study, though it had been found that patients with Bell's palsy and diabetes mellitus were 2.5 times more likely to experience the recurrent episodes than those without diabetes mellitus.[14] So, the hypothesis that Bell's palsy is caused by microvasculopathy of the facial nerves has to be proven by further studies. In fact, the recurrence is possible on the basis of reactivation of latent herpes simplex viral infection. This would happen when a trigger factor meets with a predisposing condition such as exhaustion from physical or psychological stress, systemic infection or low immunity state as in increased age, diabetes or HIV infection.

Most of the pregnancy-associated cases of Bell's palsy experienced the illness during their third trimester and immediate post partum period.[15-17] It was found in a previous study that the incidence of Bell's palsy during pregnancy was 45: 100,000 pregnancies and considered to be 3.3 times higher than normal women.[15] Primigravid cases were found more frequent in this study and also in some other studies,[3, 15-17] although some authors have argued that the sequence of gravidity has no significant influence on the involvement of the disorder. Pre-eclampsia was found to be six times more prevalent in pregnancy-associated Bell's palsy women than in normal pregnant women,[17] and also more common in primigravida but whethers there is any correlation of the pathogenesis between pre-eclampsia and Bell's palsy is doubtful. Whether microvasculopathy, the pathogenesis described in pre-eclamsia, does really occur in Bell's palsy is a challenging hypothesis to

be proved. It has been proposed that the increment of extracellular fluid causing interstitial edema of the facial nerves and the alteration of the immune system during late pregnancy were the predisposing factors for Bell's palsy in pregnant women.[16, 17]

The percentages of Bell's palsy cases with associated diabetes mellitus and hypertension were comparable to those of previous reports, which ranged from 2.5 to 10% for diabetes mellitus and from 8 to 36% for hypertension.[2, 8, 10, 18] By using glucose tolerance test, Mori et al.[19] found the incidence of diabetes mellitus in patients with Bell's palsy was almost twice that in the general population. On the contrary, Abraham et al.[20] found no such significant correlation. Instead, they found a significant correlation with hypertension. Also a study by Devriese et al.[2] found a second peak of prevalence of Bell's palsy in women during older age in whom diabetes mellitus or hypertension was associated. Based on these data, the vascular theory of the pathogenesis of Bell's palsy was also proposed but is still waiting to be proven by further investigations.

A group of 79 cases of pediatric facial palsy were also included in this study. The most common cause of facial palsy was also Bell's palsy, similar to the finding in adult group (68 cases, 86.1%). Chronic otological infection was a more commonly associated disorder to be looked for, and a specific treatment modality should be provided for the infection combined with treatment for the neuropathy. The clinical characteristics of the pediatric group in this study were similar to those of the adult group.

Conclusion

There was no significant preponderance in the involvement of the disorder in either sex, age group (adult or pediatric group), the side of face or season. No definite association between diabetes mellitus or hypertension and Bell's palsy was confirmed. Pregnant women were more likely to experience the disorder during their third trimester and immediate post partum period. The recurrent episode could be experienced by a minor group of patients, and usually occurred more than one year after the first attack. Up to now the pathogenesis of Bell's palsy remains in doubt awaiting further confirmatory investigations.

Finally, this study was one of the large clinical review studies of Bell's palsy in Thailand. The limitation of the study design, which was retrospective and hospital-based, did not permit the true nature of Bell's palsy to be revealed. However, these preliminary data might be helpful for physicians in providing medical care and some significant information about the disorder to their patients. A multi-center and population-based study should be conducted to disclose the natural characteristics of Bell's palsy in the Thai population.

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