

## RESEARCH REPORT

# DIABETES MELLITUS AND BELL'S PALSYP IN IRANIAN POPULATION

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**Abstract-** During last decades many researchers have focused on the conditions associated with Bell's palsy including diabetes mellitus, hypertension, and viral infections. This study was performed to evaluate correlation of diabetes mellitus and Bell's palsy and some relevant features not discussed in the literature in an Iranian population. The presence of diabetes mellitus was evaluated in a total number of 275 subjects (75 patients with Bell's palsy and 200 control subjects). Diabetes mellitus was noted in 10 (13.3%) patients with Bell's palsy among which 6 case were diagnosed as new cases of diabetes. Previous history of Bell's palsy was present in 10.67% of the subjects with Bell's palsy. This study confirms the correlation of diabetes mellitus and Bell's palsy for the first time in an Iranian population. We suggest screening tests for diabetes mellitus to be a routine part in the management of patients with Bell's palsy, especially in developing countries.

*Acta Medica Iranica* 2008; 46(4): 333-336.

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**Key words:** Bell's palsy, diabetes mellitus, facial nerve

## INTRODUCTION

One of the most common causes of the abrupt onset of unilateral facial weakness is Bell's palsy. This term should be reserved for those cases of facial paralysis having signs and symptoms consistent with the disease and a negative diligent search for other causes. Other etiologies of facial paralysis include malignancy, facial neuroma, intracranial tumor, infection, and some other manageable causes (1).

Our knowledge about the prevalence and incidence of Bell's palsy remains limited. This is because of the benign nature and short duration of the disease. Various specialists are involved in treating the Bell's palsy but in many cases, patients are easily diagnosed and treated by a general practitioner without being referred to a specialist. Thus, the real incidence and prevalence is higher than figures based on medical records. The average annual incidence, based on a door-to-door survey in Sicily, is 52.8 per 100,000 population age 15 years and above (2); incidence increases with advancing age. Although majority of patients suffer from a single attack, multiple episodes of recurrent (ipsilateral) or alternating (contralateral) Bell's palsy occur in 8-15% of patients (3-5).

During last decades, many scientists have been working on facial paralysis and a large number of

Received: 17 Mar. 2006, Revised: 27 Sep. 2006, Accepted: 5 Jun. 2007

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them have focused on Bell's palsy. Although viral infection is the most widely accepted etiology for Bell's palsy (3), there are many other factors such as diabetes mellitus and hypertension which is considered as accompanying, predisposing, and prognostic factors (6).

The frequency of diabetes mellitus reported in subjects affected by Bell's palsy varies widely. In the literature, we encounter figures from 7 to 39% (2, 6-9). Diabetes mellitus is a prevalent chronic disease. The incidence and prevalence of diabetes has been increasing in many societies especially among developing countries. Disease prevalence rate, for all forms of diabetes, of 7-17% have been reported in several urban populations of Iran (10). Nearly 50% of the people with diabetes type 2 are not aware of their condition. Not surprisingly, therefore, the incidence of diabetes complications is high in Iran. In the long run, uncontrolled diabetes is a life threatening condition and could lead to a wide range of simple and complicated multiorganic failures. However, a good control would, no doubt, enhance the quality of life in the affected patients and prevent consequent complications.

Analysis of Bell's palsy with underlying diabetes has not been fulfilled in a developing country with increasing number of diabetic patients. Such a study may reveal some new features of the disease. We performed this study to evaluate the correlation of Bell's palsy and diabetes mellitus and other related features in an Iranian population.

## MATERIALS AND METHODS

From July 2001 to March 2003, a total number of 275 individuals were recruited to serve as subjects in a case-control study. The study was approved by Ethics Committee of Tehran University of Medical Sciences and written informed consent was obtained from all subjects.

Seventy five Bell's palsy patients were diagnosed and selected in the affiliated hospitals of Tehran University of Medical Sciences based on the criteria offered by Taverner (1). All patients had unilateral facial paralysis or paresis with an acute onset. All other etiologies resulting in facial paralysis such as trauma, otitis media, cholesteatoma, benign and

malignant tumors, neurological disorders, and sarcoidosis were ruled out. In order to screen diabetes, we measured fasting blood sugar (FBS) in these patients. To diagnose new diabetes, a patient should have FBS > 126 mg/dl in two separate blood tests. However, previously diagnosed cases are usually on a diabetic diet and use insulin or other hypoglycemic agents. The prevalence of diabetes in this group was compared to that of a group which was selected randomly among normal Iranian population. The clinic of Internal Medicine in a tertiary referral hospital complex was used to gather 200 random subjects for our control group. None of these patients had previous history of Bell's palsy. All subjects were fully informed about the procedures and were concerned enough about their health status to take a screening blood test for diabetes.

Data collected at the end of study were analyzed using SPSS software ver 13.0 (SPSS Inc., Chicago, IL). Independent samples *t* test was used to compare means. Chi square was used to compare frequency of diabetes among groups of the study. Differences of *P* < 0.05 were considered significant.

## RESULTS

Out of 75 patients with Bell's palsy, 38 were male (50.7%) and 37 were female (49.3%). Male/female ratio was almost 1:1. Mean ages of Bell's palsy (39.5, SD: 12) and control subjects (42.9, SD: 15.3) were not statistically different (*P* = 0.08).

Fifty two percent of the patients with Bell's palsy experienced facial symptoms on the right side of their face. Other 48% experienced it on the left side. Forty six patients (61.3%) had complete paralysis and 29 patients (38.7%) had incomplete paralysis. Presentation of paralysis (complete or incomplete) with regard to diabetes is shown in Table 1.

**Table 1.** Presentation of paralysis among Bell's palsy patients with regard to diabetes\*

Bell's palsy patients	Presentation of paralysis	
	Complete	Incomplete
Diabetic (n=10)	7 (70%)	3 (30%)
Non-diabetic (n=65)	39 (60%)	26 (40%)

\*Data are given as number (percent).

**Table 2.** Symptoms of Bell's palsy\*

Symptom	Bell's palsy patients (n=75)		
	Diabetic (n=10)	Non-Diabetic (n=65)	Total (n=75)
Hypesthesia	10 (100%)	55 (84.6%)	65 (86.7%)
Facial or retroauricular pain	8 (80%)	43 (66.1%)	51 (68%)
Decreased tearing	4 (40%)	6 (9.2%)	10 (13.3%)
Hyperacusis	4 (40%)	11 (16.9%)	15 (20%)
Dysgeusia	6 (60%)	12 (18.5%)	18 (24%)

\*Data are given as number (percent).

Eight patients revealed positive previous history of Bell's palsy (10.67%) among which 2 patients were diabetic.

One of the patients with recurrent Bell's palsy had the history of two previous episodes, while others had only experienced it once before the current attack. No patient had bilateral paralysis. Frequency of symptoms in Bell's palsy patients are summarized in Table 2.

Mean values of FBS among subjects of the study is presented in Table 3. Ten diabetic individuals (13.3%) were detected in the group of patients with Bell's palsy among which 6 subjects (60%) were diagnosed as new cases and other 4 (40%) were previously diagnosed as diabetic and were on prescribed medications. Diabetes was present in 11 control subjects (5.5%). Two (18.2%) of them were new cases while majority (81.8%) were previously diagnosed. Frequency of diabetes was significantly different between two groups ( $\chi^2=4.74$ ,  $P < 0.03$ ). Odds ratio estimate for this correlation was 2.64 (95% CI: 1.07-6.51,  $P < 0.04$ ).

The majority of diabetic patients in both groups had diabetes type II (90% of Bell's palsy patients and 90.9% of control subjects). Mean ages of diabetic (60.3 years) and non-diabetic (36.2 years) subjects among patients with Bell's palsy were significantly different ( $P < 0.001$ ).

## DISCUSSION

Iran is a large multiethnic country and the lifetime prevalence and incidence of many diseases such as diabetes mellitus is subject to change among various ethnic groups. However, collecting a control sample from our clinic in a tertiary hospital complex, we easily compared the frequency of diabetes in the subjects with Bell's palsy to that of a reference resembling Iranian population.

As mentioned before, the frequency of diabetes mellitus reported in the people affected by Bell's palsy varies widely. This may be due to different genetic or environmental risk factors of diabetes in ethnic groups among different regions of the world. In this study, we encountered the frequency of 13.3%. Our results confirm the widely accepted correlation of diabetes and Bell's palsy but this time in an Iranian population.

Diabetes prevalence is been increasing among developing countries and it could remain undiagnosed in a large number of patients for many years. In this study we detected 6 new diabetic patients in the evaluation of Bell's palsy patients.

Greater proportion of newly diagnosed diabetic Bell's palsy patients (compared to only 2 newly diagnosed diabetic patients in control group) may lead us to conclude that the possibility of developing

**Table 3.** Mean values of FBS among subjects of the study

Diabetes screening test	Bell's palsy patients (n=75)		Control Subjects (n=200)	
	Diabetic (n=10)	Non-diabetic (n=65)	Diabetic (n=11)	Non-diabetic (n=189)
FBS (mg/dl)	187.6	97.7	190.2	99.8

Abbreviation: FBS, fasting blood sugar.

Bell's palsy is higher among diabetic patients in the early stages of the disease when diagnosis of diabetes is not established in many cases. However, to evaluate the statistical significance of this issue calls for further large-scale investigations.

The early diagnosis and control of diabetes prevents untoward complications of the disease. In a study by Adour *et al.*, only 10% of Bell's palsy patients with concurrent diabetes were below 39 years of age (7). They advised, therefore, screening for blood sugar evaluation only for patients who are forty years or older or who have recurrent or bilateral facial paralysis. In our study, the significant difference between mean ages of diabetic and non-diabetic subjects among patients with Bell's palsy (60.3 years in diabetic and 36.3 years in non-diabetic subjects) may lead us to a similar conclusion. However, with regard to the established correlation of diabetes and Bell's palsy, and the increasing prevalence of diabetes, we suggest screening of diabetes as a routine procedure for all patients in the management of Bell's palsy.

Our results reveals marked difference between symptoms such as decreased tearing, hyperacusis, and dysgeusia in diabetic and non-diabetic patients (Table 2). Less important difference is noted in other symptoms (hypesthesia or retroauricular pain). Large-scale studies with more diabetic subjects would demonstrate whether or not Bell's palsy patients with underlying diabetes suffer from more symptoms.

### Acknowledgement

The authors are indebted to Dr. Esfahanian in the Department of Endocrinology, Imam Khomeini Hospital Complex, for her kind assistance and helpful comments.

### Conflict of interests

The authors declare that they have no competing interests.

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