

ORAL INFECTIONS AND GLYCEMIC CONTROL THROUGHOUT PREGNANCY AND POSTNATAL PERIOD

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Summary. *The relationship between diabetes mellitus and infection is bidirectional. The most frequent infections encountered in pregnant diabetics are those of the urinary (UTI) and cervicovaginal (CVI) area. Periodontal disease (PD) is an infectious disease frequently found in these cases, often remaining as a hidden entity of low intensity. The aim of this study is to assess whether there is an association between PD and a lack of glycemic control in gestating diabetes mellitus type 2 patients. A single skilled researcher performed the periodontal evaluation of PD. Glycated alpha hemoglobin (A1C) over 6.5% was used to diagnose metabolic glucose disturbance. We controlled variables UTI, CVI, oral hygiene and adherence to treatment. Eighty type 2 diabetic women were seen during second, and third trimester and postnatal period. We found statistical association in all variables in the second trimester with Hb A1c, in the third trimester we only found statistical association between inadequate therapeutic adherence/compliance HbA1c > 6.5%. In the postnatal period we could see the association between PD and inadequate therapeutic adherence/compliance with HbA1c > 6.5%. PD may act as hidden infections in pregnant diabetics and be associated with the lack of glycemic control. We were unable to establish the consistency of the association between PD with HbA1c > 6.5% throughout of following.*

Key words: *Diabetes, periodontal disease, glycemic control*

Introduction

International Diabetes Federation estimates that at present 194 million people live with diabetes and it is expected that this number should increase to 333 millions by 2025 (1).

The National Institute of Perinatology (INPer) is one of 12 National Institutes in Mexico. The Institute's objectives are to provide gynecological and obstetrical care to women with high-risk pregnancies. Throughout the years, there have been groups that require a greater number of visits in the institute. These women who require relatively frequent office visits are Diabetes mellitus patients (type 1, type 2 or gestational). These conditions go hand in hand with México's current epidemiologic trends. In the ranking of the causes of death in México, diabetes is in the first place.

Pregnancies of diabetic women are often complicated by abortions, toxemias, polyhydramnios, premature births and maternal deaths. In these cases, infections are more common, especially those of the urinary tract, cervicovaginal area. Infections constitute one of the most serious complications in diabetes (2). In conjunction with a resistance to insulin which increases even in non-diabetic pregnant women, infections convert this situation to a greater risk for the maternal/fetal well-being in the diabetic woman during pregnancy. The majority of the fetal complications are directly linked to the degree of the insufficient control of mater-

nal diabetes (3). Adequate glycemic control of diabetic patients before and during pregnancy has proven to be a substantial element in decreasing maternal and perinatal morbimortality. The relationship between diabetes and infections is bidirectional.

According to Socransky's definition, PD is a mixed endogenous infection caused by microorganisms that colonize the sub-gingival dental-bacterial plaque, in a structure known as a biofilm (4). PD is a process often seen in diabetic women who become pregnant (5). PD may induce or perpetuate an elevated inflammatory state not only locally (6). Oral infections are associated with the lack of glycemic control in DM2. Grossi in 2002 found the association of PD with metabolic imbalances (7). This association throughout the pregnancy and postnatal period was not determined. This study was performed to assess the relationship between the presence of PD with a lack of glycemic control in gestating diabetes mellitus type 2 patients, throughout the pregnancy and postnatal period.

Materials and Methods

This study protocol was registered at the Dirección de Investigación (Research Direction) at the INPer and it was approved by the hospital's Research and Ethics Commissions. Since pregnant patients were going to participate in the study and given the fact that minimum

as established by the General Health Law of Mexico. The study design was observational, longitudinal, analytical and prolective. Type 2 diabetes mellitus pregnant patients were selected using a non-probabilistic method, consecutive by convenience, from gestating patients seen at the INPer. The sample size constituted of 80 pregnant patients seen at the Endocrinology Service outpatients clinic. They were examined and selected if they met the following Inclusion criteria: 1) Type 2 diabetes patient, 2) 24 or 26 week pregnancy; 3) A,B, and C White Classification, in order for the researchers to speak the same language, in addition to being a prognostic classification used in gynecology- obstetrics to establish certain criteria for the well being of pregnant patients (8), 4) without any other associated pathology, 5) currently not taking any drugs and 6) non smoking.

The objective was the analysis of the association between the presence of PD with the lack of glycemic control. All women included in the study were evaluated (three times – second, third trimester in pregnancy and two months in the postnatal period) as based on glycemic control measured using serum glyated Hb A_{1c}. The criterion used for glycemic control was ≤ 6.5%. We controlled confounding variables cervicovaginal and urinary tract infections. Periodontitis was assessed using the Gingival Index (9). Oral hygiene (IOH) was measured with the Green and Vermillon Oral Hygiene (10). For the clinical diagnosis of cervicovaginal (CVI) and urinary tract infections (UTI), patients were seen by an infection specialist, and test such as cervicovaginal exudates and urocultures were done at the Sexually Transmitted Infections Research Laboratory. We controlled the therapeutic adherence/compliance, by determining the degree of patient compliance to the recommended treatments (diet, insulin use) (11).

Statistical Analysis

The information from the instruments and the laboratory test was gathered and registered on special formats. The database was analyzed using the Statistical Package for Social Sciences (SPSS) version 13.0. Afterwards, a descriptive analysis of the variables was done, and simple frequencies, central tendency, and dispersion figures were analyzed. Chi square test and analysis of variance were used.

Results

80 pregnant women with type 2 diabetes mellitus were evaluated. Their average age was 31 years old (± 5.8). The patients had diabetes for an average of 4.5 years (± 3.3), and were in the second trimester of their pregnancy between 24 and 26. By occupation they were 86.6% housewives and 13.4% dealing with commerce/sales. As for their education, 2.4% were illiterate, 24.4% finished elementary school, 23.6% junior high school, and 8.7% senior high school. Table 1 shows the number of cases affected for each variable in addition to those that also had HbA_{1c} titers > 6.5%. We found the statistical association in all variables in the second trimester with Hb A_{1c}. In the third trimester we only found statistical association between the inadequate therapeutic adherence/compliance HbA_{1c} > 6.5%. In the postnatal period we could see the association between PD and inadequate therapeutic adherence/ compliance with HbA_{1c} > 6.5%. It's important to pay attention to the therapeutic adherence which was the only variable with consistent association through the following,

Discussion

In 1993, the American Diabetes Association published that oral cavity disease placed sixth among the complications in diabetic patients (12). Several factors are implicated in the pathogenia of oral disease in cases of DM. Among those considered are diabetic microangiopathy, inhibition of macrophages and neutrophils with decrease in its phagocytic function, in addition to changes in collagen metabolism (13).

Data gathered in this study allow us to describe variables, their distribution patterns throughout different periods. The frequency of PD found in this group is greater than that previously reported by López and colleagues in 1996 who reported that pregnant type 2 diabetic have 42.2% (14). We were unalbe to establish a consistent association between PD with HbA_{1c} > 6.5% throughout of following. We can see that the frequency of PD increases in the third trimester- this observation was made by several authors - but there were slightly less patients with A1c > 6.5% .

The lack of therapeutic compliance in chronic illnesses such as diabetes is a frequent problem that requires working in multidisciplinary groups where dentistry must participate.

Table 1. Frequency distributions associated with A_{1c} > 6.5%

Variable	Second Trimester		Third Trimester		Postnatal Period	
	Frequency	A _{1c} >6.5% (28)	Frequency	A _{1c} >6.5% (23)	Frequency	A _{1c} >6.5% (36)
PD	51	24** .47	59	18 .30	35	28** .80
UTI	10	8** .80	32	11 .34	37	16 .43
CVI	15	9* .60	22	6 .27	51	14 .27
Inadequate TA	42	21** .50	31	13** .42	23	16** .70

n = 80. p<.05 * p<.001 **

Conclusion

Pregnant diabetic patients are susceptible to infections. Periodontal disease can remain as a hidden condi-

tion and it can contribute to metabolic imbalance of diabetic type 2 pregnant patients.

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ORALNE INFEKCIJE I GLIKEMIJSKA KONTROLA TOKOM TRUDNOĆE I POSTNATALNOG PERIODA

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Kratak sadržaj: *Odnos između diabetes melitusa i infekcije je dvosmeran. Najčešće infekcije trudnica koje boluju od dijabetesa su infekcije urinarne (UTI) i cervikovaginalne (CVI) oblasti. Kod ovakvih slučajeva najčešće se javlja periodontalno oboljenje (PD) koje je sakriveno i slabog je intenziteta. Cilj ove studije je da proceni postojanje veze između PD'a i nedostatka glikemijske kontrole kod trudnica koje boluju od dijabetes melitusa 2. tipa. Istraživač je obavio periodontalnu procenu PD-a. Metabolički poremećaj glukoze je dijagnostifikovan pomoću glikemijskog alfa hemoglobina (A1C). Kontrolisane su varijable UTI, CVI, oralna higijena i pridržavanje tretmanu. Tokom drugog i trećeg trimestra i tokom postnatalnog perioda pregledano je 80 žena sa dijabetesom tipa 2. Pronađena je statistička povezanost svih varijabli sa Hb A1C, u drugom trimestru, a u trećem trimestru je otkrivena samo statistička povezanost između neadekvatnog pridržavanja tretmanu i Hb A1C > 6,5%. U postnatalnom periodu mogla se videti povezanost između PD i neadekvatnog pridržavanja tretmanu sa Hb A1C > 6,5%. PD mogu da je jave kao sakrivene infekcije kod trudnica sa dijabetesom i da se dovedu u vezu sa nedostatkom glikemijske kontrole. Nismo uspeli da uspostavimo doslednu povezanost između PD i Hb A1C > 6,5% tokom kontrolnog perioda.*

Ključne reči: *dijabetes, periodontalno oboljenje, glikemijska kontrola*