

# CÁRIE DENTÁRIA EM GESTANTES DE ALTO RISCO: CONDIÇÕES SISTÊMICAS E FATORES SOCIODEMOGRÁFICOS

## CARIES DENTAL EN MUJERES EMBARAZADAS DE ALTO RIESGO: CONDICIONES SISTÉMICAS Y FACTORES SOCIODEMOGRÁFICOS

### DENTAL CARIES STATUS IN HIGH-RISK PREGNANT WOMEN: SYSTEMIC CONDITIONS AND SOCIODEMOGRAPHIC FACTORS

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#### Resumo

Objetivou-se investigar a condição de saúde bucal de gestantes de alto risco. Trata-se de um estudo transversal, realizado em um centro de atenção secundária de 2016 a 2018. Participaram do estudo 1500 gestantes de alto risco. Foram excluídas do estudo as gestantes que se recusaram a participar ou estiverem impossibilitadas de realizar o exame. Foram realizados exames bucais de acordo com critérios da Organização Mundial da Saúde. O perfil das gestantes de alto risco foi coletado nos prontuários médicos. As seguintes variáveis independentes foram analisadas: idade, renda, escolaridade, hipertensão arterial, hipertensão arterial gestacional, diabetes mellitus, diabetes mellitus gestacional, obesidade, tabagismo. Foram realizados testes estatísticos de associação (qui-quadrado), a um nível de significância de 5%. Após, foram realizadas análises de regressão logística univariada e multivariada. A cárie dentária foi associada às seguintes variáveis: renda ( $p=0.00$ ); escolaridade ( $p=0.00$ ) hipertensão arterial ( $p=0.01$ ), tabagismo ( $p=0.00$ ) e obesidade ( $p=0.00$ ). Conclusão: Concluiu-se que a cárie dentária tem alta prevalência em gestantes de alto risco e está associada a renda, escolaridade, hipertensão arterial, tabagismo e obesidade.

**PALAVRAS CHAVE:** Cárie dentária; Saúde bucal; Gravidez; Gravidez de alto risco

#### Resumen

El objetivo fue investigar el estado de salud bucal de mujeres embarazadas de alto riesgo. Se trata de un estudio transversal, realizado en un centro de atención secundaria de 2016

a 2018. En el estudio participaron 1.500 mujeres embarazadas de alto riesgo. Las mujeres embarazadas que se negaron a participar o no pudieron realizar el examen fueron excluidas del estudio. Los exámenes bucales se realizaron de acuerdo con los criterios de la Organización Mundial de la Salud y se recogió el perfil de las mujeres embarazadas de alto riesgo a partir de las historias clínicas. Se analizaron las siguientes variables independientes: edad, ingresos, escolaridad, hipertensión arterial, hipertensión arterial gestacional, diabetes mellitus, diabetes mellitus gestacional, obesidad, tabaquismo. Se realizaron pruebas estadísticas de asociación (chi-cuadrado), a un nivel de significancia del 5%. Posteriormente, se realizaron análisis de regresión logística univariados y multivariados. La caries dental se asoció con las siguientes variables: ingresos ( $p=0,00$ ); escolaridad ( $p=0,00$ ) hipertensión arterial ( $p=0,01$ ), tabaquismo ( $p=0,00$ ) y obesidad ( $p=0,00$ ). Conclusión: Se concluyó que la caries dental tiene una alta prevalencia en gestantes de alto riesgo y se asocia con ingresos, educación, hipertensión arterial, tabaquismo y obesidad.

**PALABRAS CLAVE:** Caries dental; Salud bucal; Embarazo; Embarazo de Alto Riesgo

### **Abstract**

The aim of this research was to investigate the oral health condition of high-risk pregnant women. This was a cross-sectional study carried out in the specialised medical service for high-risk pregnant women from 2016 to 2018. Oral health data were collected in 1500 high-risk pregnant women using a methodology recommended by the World Health Organization to perform the clinical examination. High-risk pregnant women scheduled for prenatal consultations were included in the present study. The exclusion criteria were refusal by the pregnant woman to participate in the study or inability to perform the oral examination due to excessive nausea or vomiting of the patient. The following variables were analysed: age, income, educational level, arterial hypertension, gestational arterial hypertension, diabetes mellitus, gestational diabetes mellitus, obesity and smoking. Association tests, chi-square, were made at significance level of 5%. After, univariate and multivariate logistic regression analyzes were performed to estimate odds ratio and confidence interval. The Decayed teeth was associated with following variables: income ( $p=0.00$ ); educational level ( $p=0.00$ ) arterial hypertension ( $p=0.01$ ), smoking ( $p=0.00$ ) and obesity ( $p=0.00$ ). It was concluded that dental caries have a high prevalence in high-risk pregnant women and are associated with income, educational level, arterial hypertension, smoking and obesity.

**KEYWORDS:** Dental caries; Oral health; Pregnancy; Pregnancy, High-Risk.

## **1. INTRODUCTION**

The high maternal mortality ratios (MMR) are indicative of precarious socioeconomic conditions, low levels of education, family dynamics in which violence is present and above all, difficulties in accessing good health services (WORLD HEALTH ORGANIZATION et al., 2015). In the year 2000, at a meeting of the United Nations, 189 countries signed a commitment to combat extreme

poverty of society to make the world more supportive and fair, thus, developing the document entitled 'Millennium Development Goals' (WORLD HEALTH ORGANIZATION et al., 2015). Among the objectives was the improvement of the health of pregnant women, with targets for reducing the MMR rate by 75% in 2015 (WORLD HEALTH ORGANIZATION et al., 2015). In Brazil, between 1990 and 2015, the MMR per 100,000 live births decreased from 104 to 44 deaths, and although the goal was not reached, significant advances were achieved (WORLD HEALTH ORGANIZATION et al., 2015). In 2015, a new commitment with targets for 2030 was set in the document 'Sustainable Development Goals', which aims to accelerate the reduction in the global MMR rate and eliminate the preventable deaths of newborns and children under 5 years old (UNITED NATIONS, 2015).

Pregnancy is a phenomenon that involves physiological, social and emotional changes, but should be considered by pregnant women and health professionals as a healthy life experience. However, there are a small number of pregnant women who, due to their disease, suffer an injury or problems and are more likely to develop adverse effects with respect to both themselves and the foetus. This population is called 'high-risk pregnant women' (BRASIL, 2012). In Brazil, health centres consider factors in high-risk pregnant women such as arterial hypertension, obesity, cardiopathies, endocrinopathies (diabetes and thyroid disease) or infectious diseases, individual characteristics and adverse sociodemographic conditions (age, income, educational level, smoking) (BRASIL, 2012).

Prenatal care is extremely important and in reproductive healthcare has the relevant function of screening, diagnosis, promotion and prevention of diseases (BARBARO; LETTIERE; NAKANO, 2014; WORLD HEALTH ORGANIZATION, 2016a). Since oral health is not dissociated from general health, prenatal dental care is of great relevance for maternal and child health (VAMOS et al., 2015, 2019) since pregnant women represent a risk group for oral diseases (AZOFEIFA et al., 2016). The prevalence of periodontal disease in pregnancy is high (MOIMAZ et al., 2010), and there is evidence that periodontal diseases are associated with low birth weight and premature births (MOIMAZ et al., 2010; VIEIRA et al., 2018). Pregnant women represent a group at risk for caries with high prevalence. A survey carried out in Brazil showed a 65% prevalence of caries on pregnant women according to the decayed, missing, or filled teeth index (DMFT) (KRÜGER et al., 2015). The most common factors associated with this condition are nausea and vomiting, a reduction in oral hygiene, alterations of the diet and an increase in the quantity and frequency of intake of sugary foods and carbohydrates (SONBUL et al., 2017); all of which contribute to a reduction in salivary pH (JAIN; KAUR, 2015), that is imperative factor to development of dental caries.

Dental care during pregnancy and the postnatal period can promote the acquisition of healthy habits (VAMOS et al., 2015) and facilitate breastfeeding, leading to better development and orofacial growth of the baby (MOIMAZ et al., 2017). However, there is resistance on the part of pregnant women and professionals to perform dental procedures during gestation for fear of harming the foetus; the professional decides to not refer the pregnant woman for treatment, which consolidates the myths regarding dental care during pregnancy (VAMOS et al., 2019).

Considering the prenatal care performed by a multidisciplinary team, either in primary care or even in specialized care (for high-risk pregnancies), the protocol recommended by the Health Ministry of Brazil indicates at least one dental appointment. However, it is noted that pregnant women avoid dental appointment, due to fear, previous trauma or because they consider that they cannot go to the dentist during pregnancy. In practice, it is important that the professional team to whom the pregnant woman reports oral problems has to be prepared during prenatal care appointments to identify the main risk groups amongst pregnant women, as well as, questioning patients about possible symptoms in order to avoid severe oral issues. Pregnant women with associated systemic conditions need attention from the professional, since some diseases can harm and even make dental care unfeasible. For the monitoring of dental health, regular reporting and compiling of dental records is crucial (WORLD HEALTH ORGANIZATION, 2013). The distribution of caries occurrence in high-risk pregnant women is not

monitored well worldwide; similarly there are few studies addressing the oral health of high-risk pregnant women. Given the lack of large-scale studies regarding the epidemiology of dental caries in high-risk pregnant women, we aimed to investigate the oral health condition of high-risk pregnant women in the present study.

## **2. METHOD**

This was a cross-sectional study carried out in the specialized medical service for high-risk pregnant women, from 2016 to 2018. This medical service represents a secondary level of attention in Brazilian public health system (SUS) and it offers appointments, exams and surgeries in the same place, to provide faster diagnosis and treatment of patients, as well as, medical care to several specialties such as high-risk obstetrics, rheumatology, mastology, among others.

Oral health data were collected in 1500 high-risk pregnant women using a methodology recommended by the World Health Organization (WHO) (WORLD HEALTH ORGANIZATION, 2013) to perform the clinical examination, and the dental condition was analysed according to the DMFT (decayed, missing or filled tooth) index. The patient profiles were verified through medical records.

High-risk pregnant women scheduled for prenatal appointment were included in the present study. The exclusion criteria were refusal by the pregnant woman to participate in the study or inability to perform the oral examination due to excessive nausea or vomiting of the patient. The following variables were analysed: age, income, educational level, arterial hypertension, gestational arterial hypertension, diabetes mellitus, gestational diabetes mellitus, obesity and smoking.

Clinical examinations were performed by 2 teams, consisting of an examiner and a researcher, all of whom were duly calibrated. The inter-examiner calibration was performed prior to the examinations, aiming to ensure uniform interpretation, understanding and application of the criteria. The kappa statistical test was applied, with the minimum acceptable value being 0.89, indicating an excellent level of agreement. During the collection of clinical data, verification of the maintenance of the diagnostic criteria and the measurement of the intra-examiner error was determined by the 10% review of pregnant women, a percentage indicated by the WHO.

The quantitative data analysis was performed using the Epi Info (CENTERS FOR DISEASE CONTROL AND PREVENTION, 2018) software version 7.2 for Windows® through frequency distribution, and association tests were performed. Association and Chi-square tests were performed at a significance level of 5%. Subsequently, univariate and multivariate logistic regression analyses were performed to estimate the odds ratio (OR) and confidence interval (CI) between the outcome variables: age, income, educational level, arterial hypertension, gestational arterial hypertension, diabetes mellitus, gestational diabetes mellitus, obesity and smoking.

The research was approved by the Ethics Committee on Research with human beings at São Paulo State University (Unesp) - School of Dentistry, Araçatuba (protocol number: 1.914.629; CAAE: 60855316.8.0000.5420). All the subjects gave their informed consent prior to participating in the present study.

## **3. RESULTS**

The present research included a total sample of 1500 high-risk pregnant women distributed according to sociodemographic factors and systemic condition by the DMFT index. Of the total number of pregnant women, only 5.93% (n = 89) had a DMFT score of 0, which means the patient had zero dental caries in all life. In Table 1, it can be observed that the components of the DMFT index were statistically associated with sociodemographic factors (age, income and educational level).

Table 1 - High-risk pregnant women with at least one untreated decayed, missing or filled tooth according to sociodemographic factors. 2020.

Variables	Decayed teeth			Missing teeth			Filled teeth		
	yes	No	p-value	yes	No	p-value	yes	No	p-value
<b>Age</b>									
< 15 years	41	43		6	78		54	30	
16–34 years	585	486	0.47	532	539	0.00*	925	146	0.00*
> 35 years	180	165		270	75		333	12	
<b>Income</b>									
< R\$ 500,00	54	28		41	41		72	10	
R\$500,01-R\$ 1500,00	373	265		332	306		543	95	
R\$1500,01-R\$ 2500,00	250	240	0.00*	279	211	0.19	437	53	0.02*
> R\$ 2500,00	98	144		141	101		223	19	
Did not answer	31	17		15	33		36	12	
<b>Educational Level</b>									
< 1 year	10	5		11	4		10	5	
≤ 1–7 years	148	90		134	104		206	32	
≤ 8–10 years	293	210	0.00*	242	261	0.02*	421	82	0.00*
11 years	253	264		292	225		465	52	
≥ 12 years	91	136		129	98		210	17	

Pearson's Chi-square test \* $p < 0.05$

Performance of multivariate analysis revealed that the 'decayed teeth' condition had a high association with income and educational level, with rises in these parameters showing a decrease in the incidence of 'decayed teeth'. The 'missing teeth' and 'filled teeth' components were associated with age (Table 2).

Table 2 - Logistic regression model with crude and adjusted analyses for the association between decayed, missing, or filled teeth and sociodemographic factors in High-risk pregnant women. 2020.

Variables	Decayed Teeth		Missing Teeth		Filled Teeth		
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	
	Crude Model	Adjusted Model	Crude Model	Adjusted Model	Crude Model	Adjusted Model	
Age	< 15 years	0.60 (0.36–0.99)*	-	0.06 (0.02–0.17)*	0.06 (0.02–0.17)*	0.29 (0.17–0.50)*	0.30 (0.17–0.51)*
	16–34 years	-	-	-	-	-	-
	≥ 35 Years	0.94 (0.73–1.21)	-	3.46 (2.60–4.61)*	3.60 (2.71–4.78)*	4.35 (2.34–8.06)*	4.46 (2.41–8.27)*
Income	< R\$ 500,00	2.21 (1.29–3.79)*	2.23 (1.31–3.82)*	0.69 (0.40–1.20)	-	0.75 (0.32–1.75)	-
	R\$500,01- R\$ 1500,00	1.73 (1.27–2.37)*	1.75 (1.28–2.40)*	0.85 (0.61–1.19)	-	0.60 (0.35–1.04)	-
	R\$1500,01- R\$ 2500,00	1.42 (1.04–1.95)*	1.43 (1.04–1.97)*	0.94 (0.68–1.31)	-	0.72 (0.41–1.26)	-
	> R\$ 2500,00	-	-	-	-	-	-
	<1 year	4.34 (1.15–16.39)*	4.27 (1.13–16.12)*	2.12 (0.54–8.29)	-	0.13 (0.33–0.51)*	0.12 (0.31–0.46)*
Educational Level	≤ 1–7 years	2.20 (1.48–3.27)*	2.07 (1.40–3.06)*	1.36 (0.90–2.07)	-	0.73 (0.38–1.44)	0.65 (0.34–1.25)
	≤ 8–10 years	1.84 (1.32–2.58)*	1.78 (1.27–2.48)*	1.03 (0.73–1.46)	-	0.62 (0.35–1.11)	0.56 (0.32–0.98)*
	11 years	1.42 (1.03–1.96)*	1.42 (1.03–1.97)*	1.09 (0.78–1.52)	-	0.85 (0.47–1.52)	0.80 (0.45–1.43)
	≥ 12 years	-	-	-	-	-	-

Multivariate analysis, binary logistic regression \* $p < 0.05$ .

In Table 3, the prevalence of pregnant women with at least one untreated decayed, missing, or filled tooth is presented according to the systemic condition. It is possible to observe a statistical association of ‘decayed teeth’ with arterial hypertension ( $p < 0.01$ ), smoking ( $p < 0.001$ ) and obesity ( $p < 0.01$ ). ‘Missing teeth’ were statistically associated with diabetes mellitus ( $p < 0.01$ ).

Table 3 - High-risk pregnant women with at least one untreated decayed, missing, or filled tooth according to the systemic condition. 2020.

Variables	Decayed teeth			Missing teeth			Filled teeth			
	Yes	No	<i>p</i> -value	Yes	No	<i>p</i> -value	Yes	No	<i>p</i> -value	
Arterial hypertension	Yes	118	71	0.01*	114	75	0.06	173	16	0.07
	No	688	623		694	617		1139	172	
Gestational arterial hypertension	Yes	134	105	0.43	132	107	0.65	209	30	0.85
	No	672	589		676	585		1103	158	
Diabetes mellitus	Yes	44	32	0.46	53	23	0.00*	72	4	0.05*
	No	762	662		755	669		1240	184	
Gestational diabetes mellitus	Yes	46	45	0.53	58	33	0.05	81	10	0.63
	No	760	649		750	659		1231	178	
Smoking	Yes	89	44	0.00*	74	59	0.67	114	19	0.54
	No	717	650		734	633		1197	170	
Obesity	Yes	80	40	0.00*	69	51	0.41	108	12	0.37
	No	726	654		739	641		1203	177	

Pearson’s Chi-square test

\* $p < 0.05$

Univariate and multivariate analyses (Table 4) demonstrate that arterial hypertension (OR = 1.46; CI = 1.05–2.03), smoking (OR = 1.86; CI = 1.26–2.70) and obesity (OR = 1.64; CI = 1.09–2.46) were associated with ‘decayed teeth’ in high-risk pregnant women. Similarly, diabetes mellitus (OR = 2.00; CI = 1.20–3.32) and gestational diabetes mellitus (OR = 1.57; CI = 1.01–2.44) were associated with ‘missing teeth’ in both the univariate and multivariate analyses.

Table 4 - Logistic regression model with univariate and multivariate analyses for the association between decayed, missing, or filled teeth and sociodemographic factors in High-risk pregnant women. 2020.

Variables	Decayed teeth		Missing teeth		Filled teeth	
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
	Univariate analysis	Multivariate analysis	Univariate analysis	Multivariate analysis	Univariate analysis	Multivariate analysis
Arterial hypertension	1.51 (1.10–2.06)*	1.46 (1.05–2.03)*	1.35 (0.99–1.84)*	1.26 (0.91–1.74)	1.64 (0.96–2.81)*	1.49 (0.86–2.59)
Gestational Arterial hypertension	1.12 (0.85–1.48)	1.17 (0.88–1.56)	1.07 (0.81–1.41)	1.10 (0.82–1.46)	0.96 (0.64–1.45)	0.99 (0.65–1.52)
Diabetes mellitus	1.20 (0.75–1.91)	1.07 (0.66–1.73)	2.04 (1.24–3.37)*	2.00 (1.20–3.32)*	2.69 (0.97–7.44)*	2.48 (0.89–6.92)
Gestational diabetes mellitus	0.87 (0.57–1.33)	0.85 (0.55–1.30)	1.54 (1.00–2.40)*	1.57 (1.01–2.44)*	1.18 (0.60–2.32)	1.18 (0.60–2.32)
Smoking	1.83 (1.26–2.67)*	1.85 (1.26–2.70)*	1.08 (0.76–1.55)	1.10 (0.77–1.58)	0.85 (0.51–1.42)	0.85 (0.51–1.42)
Obesity	1.80 (1.22–2.67)*	1.64 (1.09–2.46)*	1.17 (0.81–1.71)	1.07 (0.72–1.58)	1.32 (0.72–2.45)	1.21 (0.64–2.28)

Univariate analysis, Pearson's Chi-square test; multivariate analysis, binary logistic regression

\* $p < 0.05$

#### 4. DISCUSSION

The present study regarding the oral health condition in high-risk pregnant women revealed consistent associations between the presence of dental caries and multiple variables such as sociodemographic factors and systemic condition. Dental caries are the most common non-communicable diseases in the world and its development occurs when bacteria in the mouth metabolize sugars to produce acid that demineralizes the hard tissues of the teeth (enamel and dentine) (WORLD HEALTH ORGANIZATION, 2017).

Although there has been considerable progress in dental caries prevention and treatment over recent decades, the problem still persists, causing pain, anxiety, functional limitations and social disadvantages due to tooth loss (WORLD HEALTH ORGANIZATION, 2017). The treatment of dental diseases is expensive, consuming between 5% and 10% of the health budget in industrialised countries and would exceed the total financial resources available for child healthcare in most low-income countries (MARCENES *et al.*, 2013; WORLD HEALTH ORGANIZATION, 2017). It can be observed that social context exerts a considerable influence over the oral health status of adults and adolescents (VANO *et al.*, 2015); thus, low socio-economic status, such as low monthly income and low educational level, may demonstrate lower access to dental services and oral hygiene products and poorer knowledge regarding the importance of oral health and the means of domestic and professional oral hygiene (VANO *et al.*, 2015). Thus, it is important that the professional who is monitoring the pregnant woman is prepared to understand how relevant the social condition is for access and dental treatment. The early identification of oral problems reduces the complexity of the treatment, in other words, the solution would occur in primary care, without the need for specialized attention. Therefore, there is a need for the multi-professional team to be always aligned, with the same discourse and making referral to dental care.

Another relevant point is the interference of systemic conditions in oral health. Certain systemic conditions, including arterial hypertension, obesity and smoking, are closely related to oral diseases. It has been noted that arterial hypertension is likely associated with higher caries experience due to medication intake; the chronic use of medication to control blood pressure may decrease salivary flow, which increases caries activity (JOHNSTON; VIEIRA, 2014). A reduction in salivary flow is also



related to the prolonged use of certain medications such as anticholinergics, tricyclic antidepressants and antihypertensives, especially diuretics (COIMBRA, 2009; PEREIRA *et al.*, 2016). The use of antihypertensives or diuretics (whether in combination or not) by high-risk pregnant women with arterial hypertension is common (COIMBRA, 2009; PEREIRA *et al.*, 2016). The present study shows that pregnant women with arterial hypertension have higher caries experience; however, the sample of gestational arterial hypertension showed no significant association. This may be explained by non-chronic use of medications.

Obesity is considered a worldwide problem and is increasing among adults and children alike (WORLD HEALTH ORGANIZATION, 2016b). There is a growing concern regarding free sugars, especially in the form of sugary drinks, which increase the calorie intake and can reduce the intake of foods that contain more nutritious calories, thus, leading to a harmful diet, weight gain and a higher risk of developing non-communicable diseases such as dental caries. The increase in the quantity and frequency of intake of sugary foods and carbohydrates, associated with poor oral hygiene, results in increased caries activity, including early-childhood caries (MOIMAZ *et al.*, 2014; SOWA *et al.*, 2019). The WHO estimates that the incidence of caries is higher in individuals with sugar ingestion higher than 10% of the total calorie intake (WORLD HEALTH ORGANIZATION, 2015). In an attempt to reduce the excessive consumption of these foods, the WHO has encouraged the use of a sugar tax (WORLD HEALTH ORGANIZATION, 2016c), and some countries have already modified their fiscal policies (SOWA *et al.*, 2019). In Brazil, although there is a discussion on the subject, no tax changes have taken place.

Smoking, as well as obesity, is a public health problem and one of the leading causes of chronic systemic and oral diseases for both the mother and her infant (GERMERTH *et al.*, 2019; TEIXEIRA; LUCENA; ECHER, 2014). The most damaging effects of smoking are the development of periodontal disease, cancer, problems related to the foetus and dental caries. A smoking habit can cause biological changes, including decreased salivary flow rate and salivary buffer capacity, both of which are associated with development of caries (BERNABÉ *et al.*, 2014; HUGOSON *et al.*, 2012). Women who smoke during pregnancy have been shown previously to be less likely to be receptive to antenatal care (TSAKIRIDIS *et al.*, 2018); thus, early-childhood caries may be associated with tobacco use (KELLESARIAN *et al.*, 2017). Observing the risks and damage to general and oral health caused by smoking, Brazil has had a rigorous fiscal and media policy on tobacco use since the 1990s, including reports regarding cigarette risk during pregnancy, which reduced the smoking habit in the country, since then. However, smoking pregnant women still exist and these must be observed considering that, they represent a group of risk for dental caries.

Among the non-transmissible chronic diseases with a high incidence in pregnancy, periodontal disease, which is one of the most common chronic inflammatory diseases with gradual destruction of connective tissue surrounding the teeth, eventually leads to tooth loss. Among the various risk factors for periodontitis, diabetes has been confirmed as major; the prevalence of periodontitis is higher and its symptoms are more severe in individuals with diabetes as compared with non-diabetics (KIM *et al.*, 2013). The most severe cases of periodontal disease result in the loss of the dental element, as demonstrated by the association in the present study, which can be the reason why diabetes in pregnant women is associated with missing teeth.

Oral diseases, especially dental caries, can lead to severe pain in pregnant women, demanding more attention, since pain can raise blood pressure and even interfere on feeding practice, which is essential in the woman's health and in foetal development. Considering that anti-inflammatory drugs are contraindicated during pregnancy, pain control by the dentist may be compromised. Thus, the early identification of patients who may be at risk for either systemic condition or social vulnerability is extremely important by a professional who holds the bond with the patient and, in this situation, the

multidisciplinary team has a fundamental role for early diagnosis, referral and monitoring of dental treatment.

## **5. IMPLICATIONS FOR PRACTICE AND/OR POLICY**

In the context that oral health is not dissociated from general health and pregnant women are at high risk for oral diseases, it is extremely important that health systems include pre and postnatal dentistry in routine procedures involving pregnant woman, offering conditions for the improvement of oral health in both mother and child and providing necessary support for the reduction in mother and child mortality.

## **6. LIMITATIONS OF THE STUDY**

The present study has certain limitations. It is a cross-sectional study and demonstrates the current moment of oral diseases. New studies with salivary or blood biochemical markers should be performed to understand the mechanism of oral diseases in gestation as well the association of morbidities.

## **7. CONCLUSION**

It was concluded that dental caries have a high prevalence in high-risk pregnant women and are associated with income, educational level, arterial hypertension, smoking and obesity.

## **8. ACKNOWLEDGEMENTS**

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