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**ESTUDO DAS DOENÇAS CÁRIE E
PERIODONTAL EM MULHERES DURANTE O
PERÍODO GESTACIONAL**

**Belo Horizonte
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Dissertação apresentada ao Colegiado de Pós-Graduação em Odontologia da Faculdade de Odontologia da Universidade Federal de Minas Gerais, como requisito parcial para obtenção do grau de Mestre em Odontologia.

Área de concentração: Clínica Odontológica.

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DEDICO ESTE TRABALHO....

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“O lar é o que conhecemos e amamos. Quando estamos juntos, estamos em casa. O lar não é o lugar. Não creio que o conhecido e o amado... estejam presos com pregos... O lar é uma certa estrutura que nos é cara, onde não há perigo em ser quem somos.”

Richard Bach

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Richard Bach

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“Mais que avaliar as provas e dar notas, o importante é ensinar com amor, mostrando que sempre é possível fazer a diferença...”

autor desconhecido

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RESUMO

Este estudo prospectivo traçou o perfil epidemiológico das doenças cárie e periodontal de gestantes inscritas no Programa de Atenção Integral à Saúde da Mulher, em Pará de Minas-MG; e avaliou a influência das variáveis clínicas e sócio-demográficas na condição de saúde bucal, e a efetividade de medidas de Atenção Básica no controle do processo saúde-doença bucal. Obtido o consentimento, 105 gestantes foram caracterizadas segundo as variáveis sócio-demográficas, fatores relacionados à gravidez e à higiene bucal e examinadas clinicamente, considerando os parâmetros: índice de placa visível (IPV); sangramento à sondagem (SS); profundidade à sondagem (PS); nível de inserção clínica (NIC); presença de lesões de mancha branca ativa (LMBA) e fluxo salivar estimulado (FS). Dessas, 67 gestantes foram acompanhadas até o terceiro trimestre gestacional. Inicialmente, foram classificadas, com base no diagnóstico clínico de lesões de mancha branca ativas (LMBA) e/ou gengivite e/ou doença periodontal leve a moderada (GDP), em: G1- ausência de LMBA e GDP; G2- presença de LMBA; G3-presença de GDP; G4-presença de LMBA e GDP. Foram submetidas a medidas básicas de controle que incluíram a terapia periodontal básica (profilaxia, raspagem e alisamento radicular), aplicação tópica de gel fluoretado e sessões individuais de higiene bucal supervisionada. No segundo e terceiro trimestres da gestação foram reexaminadas e reclassificadas, seguindo os mesmos critérios anteriores. Quando os parâmetros clínicos foram comparados às variáveis sócio-demográficas, às relacionadas à gravidez e às de higiene bucal, apenas a relação entre hábito de usar fio dental e sangramento à sondagem foi estatisticamente significativa ($p < 0.05$). IPV apresentou uma correlação significativa com atividade de cárie ($p < 0.001$). As mudanças nos parâmetros clínicos foram avaliadas por meio do teste de Friedman ($\alpha = 0,05$). Uma redução significativa foi observada nos parâmetros periodontais ($p < 0.001$) e na frequência de indivíduos com LMBA ($p < 0.001$), sem diferenças significativas no FS ($p = 0.622$). As frequências de gestantes classificadas em G1, G2, G3 e G4 no primeiro e terceiro trimestres foram, respectivamente: 23.9% e 53.7%; 1.5% e 6%; 44.7% e 37.3%; 29.9% e 3%. As medidas implementadas foram efetivas, pois favoreceram a redução do número de gestantes do G4 (presença de GDP e LMBA) e o incremento no G1 (ausência de GDP e lesões LMBA).

ABSTRACT

This prospective study aimed to learn the oral health conditions of pregnant women enrolled in the Integrated Program of Women's Health Attention and evaluate the influence of clinical and socio-demographic factors on their oral health, and the effectiveness of primary oral care measures in caries and periodontal disease. Obtained ethical consent, 105 pregnant women were submitted to an interview concerning socio-demographic background, factors related to pregnancy (perceived gingival bleeding and sickness) and oral hygiene habits. They were also examined, considering the parameters: visible plaque index (VPI); bleeding on probing (BP); probing depth (PD); clinical attachment level (CAL); presence of active white spot lesions (AWSL) and stimulated salivary flow rate (SF). From those, 67 pregnant women were followed-up until 3rd gestational trimester. Initially, they were classified, according to the clinical diagnosis of active white spot lesions (AWSL), gingivitis and/or light to moderate periodontal disease (GLMPD), in: G1-absence of AWSL and GLMPD; G2-presence of AWSL; G3-presence of GLMPD; G4-presence of AWSL and GLMPD. They're submitted to control procedures including oral hygiene instructions, initial periodontal therapy (scaling and root planning) and topical fluoride; and revalued in the 2nd and 3rd gestational trimesters. When the clinical parameters were compared to socio-demographic and behavior's variables, only the relation between habit of using dental floss and bleeding on probing were statistically significant ($p < 0.05$). VPI presented a significant correlation with caries activity ($p < 0.001$), but stimulated salivary flow rate was not statistically related to caries activity. The changes in the parameters were appraised through Friedman test ($\alpha = 0,05$). A significant reduction was observed in the periodontal parameters ($p < 0.001$) and in the percentile of cases with AWSL ($p < 0.001$), without significant difference of SF ($p = 0.622$). The frequency of pregnant women classified as G1, G2, G3 and G4, at 1st and 3rd trimesters were, respectively: 23.9% and 53.7%; 1.5% and 6%; 44.7% and 37.3%; 29.9% and 3%.

The implemented procedures were effective: they favored the reduction of numbers of pregnant women in G4 (presence of GLMPD and AWSL) and the increment in G1 (absence of GLMPD and AWSL).

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1. INTRODUÇÃO

A mulher passa por estágios característicos de sua formação, desde as modificações iniciadas na adolescência até as manifestações típicas da menopausa, apresentando necessidades de naturezas diversas e de importância relativa para o bem estar individual. Essas necessidades são hierarquizadas em fisiológicas, de segurança, de amor e consideração, de estima e de auto-realização (Du-Gas, 1984; Eyer & Bernocchi, 1993).

A maternidade é um período importante do ciclo vital feminino, no qual a mulher tem oportunidade de alcançar novos níveis de integração e desenvolvimento da personalidade (Casamassimo, 2001). A gravidez é um processo que envolve mudanças fisiológicas e psicológicas complexas que afetam sensivelmente a saúde da mulher (Sposto et al., 1997). Por isso, a gestante deve receber apoio e informações diversas da equipe do pré-natal, as quais serão revertidas num parto mais saudável e num ambiente doméstico mais equilibrado (Casamassimo, 2001).

No que diz respeito às mudanças psicológicas, a mulher apresenta-se, temporariamente, com estado emocional instável devido às grandes perspectivas de mudança (Maldonado, 1986). Dentre as principais modificações anatômicas decorrentes da gravidez, destacam-se o aumento do peso e volume do útero. O volume sangüíneo sofre um acréscimo, estabelecendo-se um quadro de anemia fisiológica, acompanhada, por vezes, de taquicardia. Com o deslocamento do diafragma, existe uma queda do volume respiratório residual (Abdalla et al, 1999). Complicações sistêmicas podem ocorrer durante a gravidez como a síncope, a eclampsia, a iminência de parto e a parada cardiopulmonar (Sposto et al., 1997). Alterações imunológicas e hormonais são também evidentes no período gestacional com manifestações gerais e específicas na cavidade bucal (Steinberg, 1999; Barak et al., 2003).

As alterações periodontais ocorrem em 35% a 100% de todas as pacientes gestantes (Løe & Silness, 1963; Tarsitano & Rollings, 1993; Abdalla et al., 1999). As mudanças hormonais, causadas principalmente pela elevação das taxas de estrógeno e progesterona, levam à exacerbação de inflamações gengivais pelo aumento da vascularização da área, descamação e fragilidade do epitélio gengival. Além disso, o granuloma ou tumor gravídico manifesta-se em aproximadamente 5% das gestantes, sobretudo no segundo trimestre da gestação. Trata-se de uma lesão em forma de nódulo, séssil ou pediculado, que não ultrapassa 2 cm de tamanho, de coloração vermelho vivo, indolor, sangrante ao toque, mais freqüente na papila gengival da região anterior da maxila. (Løe & Silness, 1963; Tarsitano & Rollings, 1993; Raber-Durlacher et al., 1994; Abdalla et al., 1999)

A resposta inflamatória exacerbada ocasionando um quadro de gengivite está associada às alterações imunológicas características do estado gestacional. Modificações na resposta imunossupressora materna com conseqüente decréscimo das células T3, T4 e células β da circulação periférica e dos fluidos gengivais, associadas a um decréscimo da quimiotaxia de neutrófilos e depressão das células mediadoras do sistema imunológico e fagócitos são responsáveis pelo fenômeno. Estudos *in vitro* revelam a ocorrência de depressão da resposta dos linfócitos à ação de vários antígenos na circulação periférica, além de um decréscimo absoluto no número de células CD4-positivas (Barak et al., 2003).

As evidências de uma forte associação entre as condições periodontais e saúde-doença sistêmica trouxe à tona o termo medicina periodontal, primeiramente sugerido por Offenbacher (1996), para definir o ramo da periodontia que estuda essas relações. A existência desse relacionamento bidirecional entre as diversas doenças sistêmicas e as doenças periodontais pode aprimorar os cuidados e a atenção à saúde sistêmica, tanto de forma terapêutica como preventiva. Assim sendo, um maior esclarecimento acerca das relações de risco entre a doença periodontal e as intercorrências gestacionais pode trazer novas oportunidades e estratégias de intervenção na prevenção destas complicações. Alguns estudos

mostraram associações significativas entre a condição periodontal materna e o parto pré-termo, o baixo peso ao nascimento e a pré-eclâmpsia com conseqüências maternas e fetais simultâneas, gerando alterações cardiovasculares, hematológicas, endócrinas e metabólicas (Offenbacher et al., 1996; Dasanayake, 1998; López et al., 2002; Boggess et al., 2003).

Não existe evidência clara na literatura de que o risco à cárie dentária torna-se aumentado durante a gestação. A comprovação desta hipótese é dificultada, pois, enquanto o processo de desenvolvimento da cárie dentária demanda um período mais longo de tempo, a maioria dos estudos de correlação entre a doença cárie e a gravidez são do tipo transversal ou de acompanhamento em curto prazo (Ziskin & Hotelling, 1937; Easton, 1960; Villagrán et al., 1999; Laine, 2002). Entretanto, já foram observadas durante a gestação, modificações nas condições de risco que podem se traduzir em um desequilíbrio do processo de desmineralização/remineralização da estrutura dentária, a favor da desmineralização. Um aumento nos níveis salivares de *Streptococcus mutans* e da concentração de IgA durante a gravidez foi relatado por Widerström & Bratthall (1984); Brambilla et al. (1998); Laine (2002). O crescimento da flora acidogênica pode ser favorecido por mudanças nos hábitos dietéticos da gestante, que passa a ingerir alimentos com maior frequência e em menor quantidade, devido à crescente demanda energética e à diminuição da capacidade volumétrica do estômago, por compressão das vísceras e pelo crescimento do feto. Além disso, observou-se uma diminuição da capacidade tampão e do pH da saliva, sobretudo no final da gestação, restabelecendo-se os níveis normais prontamente após o parto (Laine et al., 1988). Foi relatada, ainda, a diminuição da concentração de cálcio e fosfato na saliva durante a gravidez (Salvolini et al., 1998). A maior ocorrência de episódios de enjôo ou regurgitações, sobretudo nos três primeiros meses da gravidez aumentam o risco de erosão dentária, contribuindo para uma susceptibilidade aumentada à cárie, nesse período (ADA, 1995; Brambilla et al., 1998; Laine, 2002).

É importante considerar que a cárie dentária é uma doença multifatorial, e que a presença de um fator isolado não é o suficiente para desencadear o processo. Assim, mesmo que a gravidez produza modificações salivares importantes, a cárie dentária se desenvolverá naquelas mulheres que apresentarem outros fatores de risco associados (Villagrán et al., 1999; Laine, 2002; Fejerskov, 2004).

Programas odontológicos direcionados para gestantes são fundamentais para orientá-las, precocemente, quanto à importância de manter a saúde bucal. Embora o tratamento das doenças já instaladas seja indispensável, a atenção deve estar fundamentada no “Modelo de Promoção de Saúde”, com uma abordagem integral do indivíduo e baseando-se em medidas educativas e preventivas (Corsetti et al., 1998).

A educação em saúde procura estimular os indivíduos e despertá-los para a necessidade de manutenção da saúde bucal, facilitando mudanças de hábitos e práticas, que constituem a maioria das medidas preventivas (Bijella, 1999). Orientações sobre saúde bucal no período pré-natal, seguidas de programas continuados pós-natais são efetivos para conscientização e retenção dos conhecimentos por parte dos pais, sobretudo, quando há integração multidisciplinar combinando esforços de dentistas e médicos, especialmente obstetras e pediatras (Schein et al., 1991; Barak et al., 2003).

A atenção odontológica durante a gravidez traz consigo uma bandeira de ideais dignos, uma vez que a mulher tem direito a uma gestação saudável e o indivíduo tem o direito de nascer, crescer e se desenvolver com saúde (Konishi, 1995). Entretanto, as gestantes enfrentam dificuldades para se submeterem à assistência odontológica quando necessitam, provavelmente devido a duas causas principais: a crença, bastante difundida de que “*a mulher grávida não pode tratar de dentes*”, e por outro lado, a recusa de boa parte dos cirurgiões-dentistas em prestar-lhes serviços, quando estes são demandados, sob alegações, sem fundamentação

científica, que reforçam o tabu referido (Narvail, 1984; Bernd et al., 1992; Gaffield et al., 2001; Costa et al.,2002).

No município de Pará de Minas, MG, é realizado o atendimento odontológico ao grupo de gestantes incluídas na assistência ao pré-natal do Programa de Atenção Integral à Saúde da Mulher da Secretaria Municipal da Saúde. Deste, participam mulheres de faixa etária variada, com características sócio-demográficas semelhantes, primíparas ou múltiparas provenientes das zonas urbana e rural do município.

Mediante a demanda por atenção odontológica apresentada por este grupo específico, o presente estudo teve como objetivo conhecer as condições de saúde bucal de gestantes inscritas no Programa de Humanização no Pré-Natal e Nascimento – SISPRENATAL – incluído no Programa de Atenção Integral à Saúde da Mulher da Secretaria Municipal de Saúde, no município de Pará de Minas-MG; e avaliar a efetividade de medidas de controle do processo saúde-doença bucal.

2. OBJETIVOS

O presente estudo teve como objetivo geral conhecer as condições de saúde bucal de gestantes inscritas no Programa de Atenção Integral à Saúde da Mulher, no município de Pará de Minas-MG; e avaliar a efetividade de medidas de controle do processo saúde-doença bucal.

Optou-se por dividir este estudo em dois capítulos:

O Capítulo 1, intitulado ***A Influência das Variáveis Clínicas e Sócio-Demográficas na Saúde Bucal de Gestantes Brasileiras***, teve como objetivos específicos descrever as características sócio-demográficas das gestantes usuárias do serviço pré-natal; traçar o perfil epidemiológico das doenças cárie e periodontal na população referida; e investigar a relação entre os achados clínicos e as variáveis sócio-demográficas, os fatores relacionados a episódios da gravidez e os hábitos de higiene bucal.

O Capítulo 2, intitulado ***Impacto de Medidas de Atenção Básica no Controle das Doenças Cárie e Periodontal: Estudo Prospectivo em Gestantes Brasileiras***, teve como objetivos específicos determinar a taxa de fluxo salivar em diferentes períodos gestacionais; introduzir medidas para o controle das doenças cárie e periodontal e avaliar o seu impacto durante a gestação.

The Influence of Clinical and Socio-Demographic Variables on the Oral Health of Brazilian Pregnant Women

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Key Words: pregnancy, socio-demographic status, caries, periodontal diseases.

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Abstract

A cross-sectional study was conducted to learn the oral health conditions of pregnant women enrolled in the Integrated Program of Women's Health Attention in Pará de Minas, MG, Brazil; and evaluate the influence of clinical and socio-demographic factors on their oral health. After ethical consent was obtained, 105 pregnant women were interviewed about their socio-demographic background, including age, number of previous pregnancies, marital status, employment status and education level. Some behaviors of pregnant women, factors related to pregnancy (perceived gingival bleeding and sickness) and oral hygiene habits were also considered. Clinical indices, including visible plaque index, bleeding on probing, probing depth, clinical attachment level, DMFT, DMFS, the presence of active white spot lesion and stimulated salivary flow rate were analyzed. The results showed that the majority (75%) of participants presented gingivitis and/or light to moderate periodontal disease. 10.5% of mothers showed active white spot lesions. When the clinical parameters were compared to socio-demographic and behavior variables, only the relation between the habit of using dental floss and bleeding on probing were statistically significant ($p < 0.05$). Visible plaque index presented a significant association with caries activity ($p < 0.001$), but stimulated salivary flow rate was not statistically related to caries activity. There is a demonstrated need for more research on maternal oral health during and after pregnancy to determine and describe the magnitude of the problem, assess characteristics of care-giving, and identifying mitigating factors that promote or hinder good oral health.

Key words: pregnancy, socio-demographic status, caries, periodontal diseases.

Introduction:

Maternity confers special status on a woman in most cultures, with changes in society's view of her, its expectations of her, and privileges granted. Similarly, the woman's views of herself and her world changes with the physical and emotional transformation she experiences in the conception, gestation, and birth of a child. Evidence points to an expectant or new mother's heightened readiness to learn and be motivated to care for her own health and that of her baby. Motherhood brings oral changes reflective of the physiologic alterations of pregnancy. This is a period in which proper maternal health care and education can have a profound effect on the mother's oral health and that of her child. So, it is a very important moment in woman's vital cycle, in which she has the opportunity of improving her personality and reaching a more balanced domestic environment (Casamassimo, 2001).

It has been shown that pregnant women have a higher incidence of gingival inflammation than non-pregnant women (Löe & Silness, 1963; Annan & Nuamah, 1998). This condition is characterized by increased redness, edema and high tendency towards bleeding and inflammation, as a result of increased circulating levels of progesterone and its effects on the gingival microvasculature, which has been termed "pregnancy gingivitis". The prevalence of this phenomenon is reported to range from 35 to 100% (Löe & Silness, 1963; Amar & Chung, 1994). Estradiol and progesterone significantly affect the formation of prostaglandins from arachidonic acid. These hormones may stimulate prostaglandin synthesis in the gingiva of pregnant women (Raber-Durlacher et al., 1991). Prostaglandin E₂ (PGE₂), a major arachidonic acid metabolite, is released locally and has many proinflammatory effects on periodontal tissues, including vasodilatation, greater vascular permeability at sites of inflammation, release of collagenase by inflammatory cells, activation of osteoclasts, and mediation of bone reabsorption (Page, 1991).

Changes in subgingival plaque composition have also been reported during pregnancy. A marked increase in the proportions of *Prevotella intermedia*, present in the subgingival dental plaque, may be observed, with an elevation in the serum levels of estrogen and progesterone during pregnancy. Based on *in vitro*

experiments, it was shown that both progesterone and estradiol serve as essential growth factors for *P. intermedia* (Kornman & Loesche, 1980).

Recently, evidence has shown an association between periodontal disease and pre-term, low birthweight babies (Offenbacher et al., 1996; Dasanayake, 1998; López et al., 2002). Additionally, other studies have shown associations between periodontal disease and pregnancy complications, such as increased risk for developing preeclampsia during pregnancy (Boggess et al., 2003).

It is not definitely known whether dental caries incidence increases during pregnancy. Most studies of pregnancy and caries have been cross-sectional or short-term follow-up studies with conflicting results (Easton, 1960; Villagrán et al., 1999; Laine, 2002). As the development of caries usually takes several years, the possible pregnancy-related increase in caries incidence is difficult to estimate. The salivary levels of *mutans streptococci* and IgA concentrations have been found to increase in pregnancy, but these changes were not concurrent with hormonal changes, since the highest levels of *mutans streptococci* and IgA occurred during the 3rd trimester of pregnancy and during lactation (Laine, 2002). Any changes in dietary habits, such as smaller meals at more frequent intervals because of the increased energy demands of this period, may favor the growth of acidogenic microbes also after delivery (Montandon et al., 2001; Laine, 2002). Also, pH and buffer effect (BE) values of paraffin-stimulated saliva have been found to decrease towards late pregnancy and promptly to recover after delivery (Laine et al., 1988). The calcium and phosphate concentrations in whole saliva seem to decrease during pregnancy (Salvoline et al., 1998). Therefore, the increased demineralization (lowered BE and pH) and decreased remineralization potential (lowered calcium and phosphate concentrations) together with increased salivary levels of *mutans streptococci* in late pregnancy and during lactation can increase the risk of caries. Morning sickness in turn may increase the risk of dental erosion. However, it is important to consider that owing to the multicausal etiology of caries, no single factor alone has any significant role in the development of caries (Villagrán et al., 1999; Fejerskov, 2004). It seems that the effect of pregnancy is rather directed toward the environmental factors of the teeth, such as changes in salivary gland function and salivary composition, than

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toward the teeth themselves. Pregnancy-related changes in saliva may promote the development of caries in mothers with other risk factors (Laine, 2002).

Several studies of dental care-seeking behaviors during pregnancy have been conducted. Most studies have shown that at most half (35-50%) of women visit the dentist during their pregnancy (Gaffield et al., 2001; Lydon-Rochelle et al., 2004; Habashneh et al., 2005). The association between use of dental services during pregnancy and demographic characteristics, however, is less clear. There are conflicting results regarding the associations of age, race, education level, and household income with the likelihood of dental visits during pregnancy (Gaffield et al., 2001; Lydon-Rochelle et al., 2004). Other factors demonstrating a significant association of dental services during pregnancy include frequency of previous utilization of dental services, when not pregnant, and having private health insurance (Gaffield et al., 2001, Habashneh et al., 2005). Recently, a Danish study reported on self-assessment of gingival health conditions of pregnant women, oral hygiene habits and dental visits during pregnancy (Christensen et al., 2003). In other studies, it has been observed that periodontal conditions in pregnant women might be affected by education level and previous periodontal therapy (Machuca et al., 1999; Yalcin et al., 2002b).

Although there is a widespread interest in general health education of women during pregnancy, in Brazil, few studies concerned about associations between clinical and social demographic factors related to oral health during pregnancy were found, after searching for these subjects in literature on baselines as Medline, Bireme, Cochrane Library.

Integrated Program of Women's Health Attention (IPWHA) provided assistance to a group of pregnant women registered in the Prenatal and Birth Humanization Program (PBHP) of Municipal Health Maternity Service of Pará de Minas, MG, Brazil. Therefore, the purposes of this study were to describe the socio-demographic characteristics of the pregnant women that use this prenatal service; evaluate their oral health conditions and investigate the relationship of the clinical variables with the socio-demographic characteristics, behaviors related to pregnancy and oral hygiene habits.

Material and Methods

The study described herein was cross-sectional study, conducted in Municipal Health Maternity Service of Pará de Minas, MG, Brazil.

1: Study population:

The target population was composed entirely of pregnant women that were in the first trimester of gestation, enrolled in the prenatal service of an Integrated Program of Women's Health Attention (IPWHA) of Municipal Health Maternity Service of Pará de Minas, MG, Brazil, from December 2004 until May 2005.

Excluded from the study were pregnant women exhibiting systemic alterations, chronic users of medication, who had smoking and/or alcoholic habits, as well as those that presented advanced periodontal disease, according to American Periodontology Association's criterion, 2000 (Armitage, 2004).

To estimate the appropriate size of the population to study, an estimate was made of the number of pregnant women who had enrolled in the prenatal program of PIAWH of Municipal Health Maternity Service of Pará de Minas, MG, Brazil, from January 2004 until June 2004. An average of 65 women per month was found positive in an exam for pregnancy. To define the sample size, a sample calculation based on an estimate for proportion, with reliability level of 95%, prevalence of active white spot lesion of 40% and required precision of 10% was done. It obtained a value of N= 92 pregnant women, with the addition of 10%, resulting in 102 pregnant women (Lwanga & Lemeshow, 1991; Kirkwood, 1996).

After applying the exclusion criteria, 105 systemically healthy pregnant women, primiparous or multiparous, were selected for this study. All the patients voluntarily enrolled in the study, following an explanation of its purpose and objectives. The participants completed informed consent forms and the study protocol was approved by the Committee of Ethics and Research of Federal University of Minas Gerais (COEP-UFMG: ETIC 492/04).

2: Data collection:

All the pregnant women who agreed to take part of the study were submitted to an interview about their socio-demographic background, including age, number of

previous pregnancies, marital status, employment status and education level. Some questions were asked regarding behaviors, such as reasons for visiting the dentist, fear of dental treatment during pregnancy, previous dental treatment during the prior 12 months, previous oral preventive assistance and instructions concerning oral health. Incidents related to pregnancy, such as perceived gingival bleeding and sickness, and oral hygiene habits – toothbrushing frequency, use of toothpaste and dental floss – were also recorded.

Visible Plaque Index (VPI) was recorded according Løe & Silness (1967).

DMFT index (decayed, missing and filled teeth) and DMFS index (decayed, missing and filled surfaces) were recorded using a dental probe and dental mirror, following epidemiological criteria of World Health Organization (WHO, 1999). Additionally, the number of active white spots lesions (AWSL) was visually counted under good illumination. In contrast with healthy enamel, which does not show differences in surface translucence 5 or 10 seconds after drying, with AWSL, white opaque spots are distinctly visible, even when the tooth is wet. On smooth tooth surfaces, they show a white demineralization parallel to the gingival margin and either close (within 1 mm), or in contact with it. They show a chalky aspect, white or light brown in color, without shine. The white opacity is usually covered with plaque and may be detected in adjacent teeth. Pits and fissures areas were diagnosed as carious when they were coloured light or dark brown at the base and/or white change on their side (Ekstrand et al., 2003; Nyvad, 2004). No x-rays were taken.

The American Academy of Periodontology criteria (Armitage, 2004) were used to recording bleeding on probing (BOP), probing depth (PD), clinical attachment level (CAL). The clinical examination was carried out with a dental mirror and a North Caroline University periodontal probe (Hu-Friedy).

The salivary flow-rate (SF) was measured by the collection of stimulated saliva method. The participants were instructed not to eat or drink for 90 minutes before the moment for saliva collection. All assessments were performed at a predefined time of the day, in the mornings, in order to minimize fluctuations related to a circadian rhythm of salivary secretion and composition. The patient was asked to chew an inert material for one minute. After that time, the patient discarded the saliva produced and

continued chewing for more five minutes, with the saliva being continually accumulated, then collected in a pre-weighed plastic tubes. After five minutes, the stimulated saliva samples were weighed to calculate flow rates, assuming the specific gravity of saliva of 1,0 g/cm³ (Kalk et al., 2001).

The interview and clinical exam were recorded by the same previously trained examiner. Interexaminer calibration exercises were conducted according to the discipline of the Clinical Department of Primary Care of the Federal University of Minas Gerais (UFMG) following two stages to practice consistency in examination and diagnosis of active carious lesions and periodontal disease. Examiner reliability, assessed by weighted Kappa scores, was greater than 85%, thereby considered a good concordance level. Intraclass correlation coefficients were 0.81.

Treatment was guaranteed by the local service itself, for all the pregnant women examined, prioritized according to the criteria of their needs. All the participants received Education for Oral Health (EOH) individually, learning about eating habits and oral hygiene.

3: Statistical Analysis:

The measurements taken are shown in percentages and in table form with medians, minimum (min) and maximum (max) values. The value of n refers to the size of the sample analyzed.

The Kruskal-Wallis test and Mann-Whitney test were used to evaluate the influence of the periodontal variables under study. These are non-parametric tests designed to compare independent samples in relation to a target measurement.

Mann-Whitney test was used in order to analyze the relation between the number of active white spot lesions with the salivary flow and prevalence of plaque.

The level of statistical significance was established at 5%.

Results

Demographic characteristics of subjects are reported in table 1. The mean age was 29.5 ± 5.65 and more than half of the population was between 20 and 29 years of age (61%). The majority of patients was married (69.5%) and had primary

and secondary education levels (95.2%). Only a few patients had a university degree (4.8%). More than half of the participants were homemakers (56.2%).

Table 2 shows the characteristics of the mothers according to variables related to pregnancy. The population was almost equally divided into primigravidae (46.7%) and multigravidae (53.3%). The majority of the patients noticed episodes of nausea (72.4%), especially when brushing their teeth (25.7%) or spontaneously (25.7%). There were a high proportion of pregnant women who perceived gingival bleeding (65.7%), which happened most frequently when brushing their teeth (63.8%) or when using dental floss (36.2%).

The invitation made during the Prenatal Care Meeting (PCM) was the main reason these pregnant women decided to visit a dentist (77.1%). A few women spontaneously visited a dentist for a check-up (15.2%) or when they perceived gingival bleeding (6.7%) and dental pain (1.0%).

Almost 60% of the pregnant women reported having no dental visit during the prior 12 months. Among mothers who reported having a dental visit (41.9%), the main types of treatment received were an examination, routine cleaning and restorative treatment (75.6%). The fear of dental treatment was reported by 10.5% of the sample.

More than half of the women studied (51.4%) had previous experience with preventive measures: at school (25.7%), at a private clinic (15.2%) or at public services (7.6%).

The factors related to oral hygiene habits practiced by the pregnant women are shown in table 3. Almost two-thirds (61%) of the women brushed their teeth three times a day. Dental floss was used by 85.7% of these mothers. Most of them used this oral hygiene aid sometimes (60%), while 25.7% used it daily. All participants used toothpaste. Most of the women studied (64.8%) had received instructions concerning oral hygiene.

Table 4 shows the periodontal disease indicators such as bleeding on probing, probing depth and clinical attachment loss, among the study population, taking as the sample unit: the patient, teeth and surfaces.

No significant differences were detected among the variables of age, education level, dental visits during prior 12 months, perceived gingival bleeding, frequency of toothbrushing and instructions received concerning oral hygiene when related to plaque index (PI) and indicators of periodontal disease (PD, CAL, BP per surfaces and teeth) ($p>0.05$). Only the habit of using dental floss seemed to be statistically significant according to periodontal parameter of bleeding on probing ($p<0.05$). Participants who related dental floss using, showed less gingival bleeding (Table 5).

The caries experience of the patients was described by mean values of the DMFT index (10.8) and DMFS index (23.6). The mean number of decayed surfaces among the expectant mothers was 1.4. Considering initial lesions (AWSL) separately, 30.7% of the participants showed this alteration.

Some interesting variables were also evaluated comparing the maternal caries activity and the comparison was found to be non-significant ($p>0.05$).

Visible Plaque Index presented a significant association with caries activity ($p<0.001$), but stimulated salivary flow rate was not statistically related to caries activity (Table 6).

Discussion

The social-demographic characteristics of the present sample were similar to those reported in other studies (Machuca et al., 1999; Santos-Pinto et al., 2001; Yalcin et al., 2002b; Christensen et al., 2003; Lydon-Rochelle et al., 2004; Honkala & Al-Ansari, 2005; Habashneh et al., 2005). The majority of pregnant women were adults, married, multiparous, had finished at least primary or secondary school and were homemakers.

The main reason for the attendance of the women at the dental service was the invitation made at the Prenatal Care Meeting, with self-motivated searches being far fewer. These results were similar to Santos Pinto et al. (2001) and Zanata et al. (2003), who suggest that the pregnant women consider dental needs a minor problem by the prenatal staff.

Brazilian studies show that the small percentage of spontaneous search for dental service (15.2%) can be explained by earlier gestational age, low socioeconomic status, low education level and fear of dental treatment (Bernd et al., 1992, Moura et al., 2001; Zanata et al.; 2003). Another factor that can contribute to the little motivation of pregnant women to go in search of dental consultation is the mistaken belief that such treatment is not recommended during the gestational period as it may put the pregnancy and the child at risk. That myth is still reinforced by the attitude of some dentists, who by assuming a defensive posture, confirm the belief in possible harmful effects of dental services in this special moment of a woman's life (Bernd et al., 1992). In this way, if on one hand a pregnant woman may fear dental treatment, on the other hand, many dentists feel insecure about providing treatment and frequently postpone it until the post-partum period (Moura et al., 2001). Nevertheless, for the present study, the fear of submitting to dental treatment was reported by only 10.5% of the participants.

A small number of pregnant women who felt the need to consult a dentist were spontaneously influenced by gingival symptoms (6.7%). One explanation might be that those women perceiving gingival problems did not consider such a condition to be a serious problem, and it appears that signs of gingival inflammation are often regarded as a "normal" condition. Earlier studies have revealed that many people do not always observe gingival bleeding and many people do not even realize that gingival bleeding is a sign of inflammation (Gilbert & Nuttall, 1999; Christensen et al., 2003). In fact, the majority of the pregnant women perceiving gingival symptoms are convinced that their self-care practices in relation to oral hygiene should be sufficient for preventing and/or curing gingival diseases (Christensen et al., 2003). The theory of self-efficacy in health behavior was developed on the basis of Health Belief Model (Bandura, 2000 in Christensen et al., 2003), assuming that people tend to adopt self-care practices if they perceive that they are capable of controlling health problems. As observed in the present study, the level of self-efficacy in oral health was high among the participants since almost two-thirds of the women brushed their teeth three times a day (61%) and used dental floss sometimes (60%). All participants reported the use of fluoride toothpaste. These results agree with those of

Christensen et al. (2003); Habashneh et al. (2005). Contesting results show that the spontaneous search for dental visits influenced by dental pain was related only by 1% of the subjects of this study, while one of the main reasons for seeking a dental appointment was dental pain (30%) according to Honkala & Al-Ansari (2005).

Whereas prior to pregnancy almost three-quarters (71%) of mothers of Iowa's studies (Habashneh et al., 2005) visited the dentist every 6-12 months and 90% in Denmark's pregnant women sample (Christensen et al., 2003) also visited the dentist in the same interval of time, our results were different. Only 41.9% of the pregnant women had visited a dentist in the 12 months prior to the study. These results are similar to a study from Germany that showed 49% of pregnant women visiting a dentist during the prior year (Günay et al., 1991) and a USA mothers' study with 43% of the sample having consulted a dentist (Gaffield et al., 2001). The literature also emphasizes that the most common reasons for not going to the dentist during pregnancy were the perception of not having a problem, the choice to delay until after pregnancy and the fact that mothers had not been informed that they should visit the dentist while pregnant or they did not consider a dental visit a priority (Habashneh et al., 2005).

Most of the patients evaluated (64.8%) reported having received some type of preventive intervention and orientation about control of oral diseases. These instructions were mostly given at school (25.7%) or private clinics (15.2%). Only 7.6% of the preventive instructions were given by a dentist from public services or in consultations with a private dentist (15.2%). In the same way, Honkala & Al-Ansari (2005) found that pregnant women received oral health instructions from a dentist only occasionally (38%). Santos-Pinto et al. (2001) showed that just 33.9% of the pregnant women received information concerning oral health care. According to them, the dentist (37.7%) was the main provider of this information, followed by another medical professional (12.3%). Radio, magazines and television programs had a less important impact (4.6%) on improving mothers' health knowledge. In contrast, Habashneh et al., (2005) found that the greatest proportion of the respondents (85%) stated that books and magazines were the most useful in learning about oral health and pregnancy, followed by "my dentist told me about it"

(54%). Thus, the results indicate that dentists must take more responsibility for giving instructions concerning oral health care. Efforts should be made to educate pregnant women about oral health, especially preventive oral self-care. To reinforce the importance of oral health care and information prior to and during pregnancy, many authors propose that dental health education might be integrated into pre-natal health care programs. Prenatal care providers including nurses and physicians should be educated regarding the reported relationships between dental health and pregnancy outcomes and should be encouraged to discuss with their patients the importance of oral health and refer patients for dental care. In addition, dentists also need to be aware of the importance of dental care during pregnancy and should be encouraged to be a part of the pre-natal team. Finally, barriers preventing pregnant women from obtaining dental care should be identified and eliminated (Mills & Moses, 2002; Lydon-Rochelle et al., 2004; Habashneh et al., 2005; Honkala & Al-Ansari, 2005).

Regarding the practices of oral hygiene, the majority of the patients (61%) reported quite favorable tooth brushing habits (brushing three times a day) in agreement with other studies (Christensen et al., 2003; Honkala & Al-Ansari, 2005; Habashneh et al., 2005). However, some authors noted that, during pregnancy, tooth-brushing occurred less frequently, less efficiently and more quickly (Montandon et al., 2001; Santos-Pinto et al., 2001). The main reasons for poorer of tooth-brushing habits were nausea (95%) and *the reduction of the available time for care of herself* (32%) (Montandon et al., 2001). Moreover, any changes in dietary habits such as smaller meals at more frequent intervals because of the increased energy demands of this period might interfere the toothbrushing habits and favor the growth of acidogenic microbes (Laine, 2002). However, in present study, just one quarter of the pregnant women related episodes of nausea when brushing their teeth. Other authors observed a decrease of toothbrushing habits because of perception of gingival bleeding (Edwards & Rowntree, 1969; Christensen et al., 2003).

Gingival bleeding was perceived by the majority of the pregnant women (65.7%), occurring more frequently during toothbrushing and while using dental floss, which agrees with the literature (Arafat, 1974). Christensen et al. (2003) found that gingival problems were perceived by only one-third of the respondents, which was

similar to results of a cross-sectional study of pregnant women in Kuwait (Honkala & Al-Ansari, 2005).

The report of the presence of gingival bleeding by pregnant women reflected the periodontal condition observed in the present study. The majority of the study population showed clinical manifestations of gingivitis or light to moderate periodontal disease, since 75.2% of the subjects presented bleeding on probing. The probing depth (>4mm;<6mm) was found in 69.5% of the mothers and clinical attachment levels that characterize light to moderate periodontal disease occurred in 27.6% of the participants. The increased predisposition to the gingivitis during pregnancy has been widely reported in the literature and has been associated with the exacerbation of the inflammatory response as a result of increased levels of circulating progesterone and estrogen. Those alterations have effects on gingival microvasculature, mainly when associated with poor oral hygiene (Silness & L oe, 1964).

Although the plaque index and periodontal indicators (BOP, PD, CAL) did not show statistically significant association with any of the variables studied (age, education level, last dental visit, perceived gingival bleeding, oral hygiene habits and preventive orientations concerning oral health), several researches have reported important associations between demographic and clinical variables with plaque index and periodontal status (Machuca et al., 1999; Yalcin et al., 2002b; Christensen et al., 2003; Lydon-Rochelle et al., 2004).

Machuca et al. (1999) found a relation between VPI and education level, showing plaque accumulation becoming lower as the level of education increased, with a statistically significant difference of $p < 0.001$ when the group with the highest education was compared to all the other groups. Similar results were related by Yalcin et al. (2002b). Previous periodontal maintenance appeared to be a determinant of VPI values, since those patients who did not regularly visit the dentist had a significantly greater VPI mean than those who did visit routinely ($p < 0.001$) (Machuca et al., 1999; Yalcin et al., 2002b). These authors also reported that BOP and PD are all directly related to previous periodontal maintenance whereas CAL is not. These findings confirm that the lack of periodontal maintenance is directly

related to the accumulation of bacterial plaque, which may result in gingival bleeding and even periodontal inflammation as first reported by Silness & Løe in 1964. It is clear that poor oral hygiene and the accumulation of plaque lead to the possible development of some types of periodontal lesion. It appears, in light of the present results and other studies, that gingivitis is the principal clinical manifestation of periodontal disease in pregnant women. However, it is not possible to determine if this represents a particular tendency toward more destructive periodontal conditions since this paper is a cross-sectional study, similar to Machuca et al. (1999); Yalcin et al (2002b).

In this paper, women who had seen a dentist within the prior 12 months did not have a statistically significance association with hygienic and periodontal status level. On the other hand, Danish pregnant women who contact dentist in the prior 12 months were more inclined to react to symptoms or signs of gingival or periodontal inflammation ($p < 0.05$) (Christensen et al., 2003).

In spite of the elevated values of DMFT and DMFS index (10.8; 23.6), the number of pregnant women with active carious lesions was not very high, since less than one third of the participants manifested these alterations in enamel. Brambilla et al. (1998) reported a mean DMFT of 12.5, similar to findings observed by Günay et al. (1998) (DMFT=14.5; DMFS=46.4) and 14.8% with active carious lesions. Soderling et al. (2000) reported a mean DMFT of 18 among expectant mothers in Finland, but the authors did not mention the decayed component or the incipient lesions. Zanata et al. (2003) observed a mean DMFT of 14 with a corresponding DMFS of 32 and the mean number of decayed surfaces was 14, becoming even more expressive if the initial lesions were taken into account, reaching a mean value of 19.9 surfaces affected by caries.

In this study, the correlation between active carious lesions and VPI showed statistical significance ($p < 0.001$). Earlier researches showed that omission of daily mechanical removal or disturbance of bacterial accumulations on teeth leads to formation of cariogenic plaque, causing development of early signs of enamel demineralization (Von der Fehr et al., 1970; Thylstrup et al., 1994).

In light of the broad field of carious lesions etiology, no single factor alone has a determinable role in the development of caries, but since several *in vivo* studies convincingly demonstrate that partial or total elimination of the intra-oral mechanical forces leads to evolution of cariogenic plaque, resulting in carious enamel dissolution, efforts must be done to control this relevant variable on caries triggering (Thylstrup et al., 1994).

Conclusions

- The majority of pregnant women were adults, married, multiparous, low education level and homemakers.
- The spontaneous search for dental care was low, which shows the importance of dentistry's professional insertion in prenatal assistance programs.
- 75.2% of pregnant women showed gingivitis and/or moderate periodontal disease; 31,4% showed active e white spot lesions, with means of DMFT and DMFS of 10.8 and 23.6 respectively.
- The majority of the findings for this study did not have a significant association with clinical indicators of carious and periodontal diseases, but should be viewed as relevant issues to be addressed for new researches.

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Table 1: Characteristics of pregnant women according to socio-demographic variables

Variable	Frequency	
	n	%
Age (years)		
Under 20	21	20.0
20 to 29	64	61.0
30 to 39	18	17.1
40 and above	2	1.9
Total	105	100.0
Marital status		
Married	73	69.5
Unmarried	32	30.5
Total	105	100.0
Educational level		
Primary School Graduate	50	47.6
Secondary School Graduate	50	47.6
College Graduate	5	4.8
Total	105	100.0
Professional level		
Homemaker	59	56.2
Employee	46	43.8
Total	105	100.0

Table 2: Characteristics of pregnant women according to variables related to pregnancy

Variable	Frequency	
	n	%
Number of Pregnancies		
First	49	46.7
Second or more	56	53.3
Total	105	100.0
Nausea		
No episodes	29	27.6
Yes, when brushing teeth	27	25.7
Yes, suddenly	27	25.7
Yes, in other situations	22	21
Total	105	100.0
Gingival bleeding perceived		
Yes	69	65.7
No	36	34.3
Total	105	100.0
Gingival bleeding		
Spontaneous	0	0
When brushing teeth	44	63.8
When flossing teeth	25	36.2
Both when brushing and flossing	0	0
No bleeding	0	0
Total	69	100.0

Table 3: Variables of oral hygiene habits practiced by the pregnant women

Variable	Frequency	
	n	%
Tooth brushing frequency		
Twice a day	12	11.4
Three times per day	64	61.0
More than 3 X per day	29	27.6
Total	105	100.0
Instructions about oral health received		
Yes	68	64.8
No	37	35.2
Total	105	100.0
Toothpaste used		
Yes	105	100.0
Total	105	100.0
Dental floss used		
Yes	27	25.7
No	15	14.3
Sometimes	63	60.0
Total	105	100.0

Table 4: Indicators of Status Periodontal of the Study Population (n=105)

Sample unit	Periodontal Parameters		
	BP (%)	PD >4mm<6mm(%)	CAL ≤ 4mm (%)
Individual ₍₁₀₅₎	75.2	69.5	27.6
Tooth ₍₂₈₁₃₎	19.5	10.9	11.3
Surface ₍₁₁₂₅₂₎	6.2	3.5	3.6

Table 5: Description and comparison between percentiles of bleeding surfaces/teeth/ individual and dental floss using

Dental floss using	n	Min	Max	Median	P
Surfaces					
Yes	27	0.0	19.0	3.0	0.068 Y = No = ST
No	15	0.0	91.7	5.6	
Sometimes	63	0.0	25.8	4.6	
Teeth					
Yes	27	0.0	56.0	8.0	0.039 N > Y
No	15	0.0	91.7	2.7	
Sometimes	63	0.0	74.1	1.9	

Note: The value of p refers to the Kruskal – Wallis test

Table 6: Description and comparison between caries activity with plaque index and salivary flow rate

Variables/AWSL	n	Min	Max	Median	P
VIP					
No	72	8.3	79.5	38.5	< 0.001
Yes	33	25.0	98.6	63.5	Y > N
Stimulated flow rate					
No	72	0.2	3.7	1.2	0.915
Yes	33	0.3	3.1	1.1	Y = N

Note: The value of p refers to the Mann-Whitney test

***Impact of Primary Oral Care in Caries and Periodontal Disease:
prospective study in Brazilian Pregnant Women***

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Abstract

This prospective study evaluated the effectiveness of primary dental care measures on caries and periodontal disease of pregnant women enrolled in a Brazilian Integrated Program of Women's Health Attention. Obtained ethical consent, 67 women were classified, according the clinical diagnoses of active white spot lesions (AWSL), gingivitis and/or light to moderate periodontal disease (GLMPD), into the following categories: G1-absence of AWSL and GLMPD; G2-presence of AWSL; G3-presence of GLMPD; G4-presence of AWSL and GLMPD. The participants underwent control procedures including oral hygiene instructions, initial periodontal therapy (scaling and root planning) and applications of topical fluoride; and re-evaluated during the 2nd and 3rd gestational trimester, along the following parameters: visible plaque index; bleeding on probing; probing depth; clinical attachment level; presence of AWSL and stimulated salivary flow rate. The changes in the parameters were appraised through Friedman test ($\alpha=5\%$). At baseline, 74.6% showed GLMPD; 31.4% with AWSL. In the 3rd exam, only 9% of them showed AWSL and 40.3% some type of periodontal alteration. A significant reduction was observed in periodontal parameters ($p < 0.001$) and in percentile of AWSL ($p < 0.001$), without significant difference of stimulated salivary flow rate ($p=0.622$). The frequency of pregnant women of G1, G2, G3 and G4, at first and third trimesters changed, respectively, 23.9% to 53.7%; 1.5% to 6%; 44.7% to 37.3%; 29.9% to 3%. The procedures implemented were effective: they favored the reduction of numbers of pregnant women in G4 (presence of GMPD and AWSL) and the increment in G1 (absence of GMPD and AWSL).

Key words: pregnancy, caries, periodontal diseases, primary dental care

Introduction

In light of previous investigations, pregnant women may be considered as patients with a higher risk of developing caries and periodontal complications, although the condition is temporary (Laine, 2002; Yalcin et al., 2002a). Maternal immune and hormonal changes occur during pregnancy, which may affect the oral metabolism and play an important role in the pathogenesis of pregnancy gingivitis (Löe & Silness, 1963; Miyazaki et al., 1991; Amar & Chung, 1994). It has been suggested that changes in maternal immunoresponsiveness, such as a decrease in T3, T4, and β -cells in peripheral blood and gingival tissue, decreased neutrophil chemotaxis, and depression of cell-mediated immunity and phagocytosis might play a role. A decrease in *in vitro* responses of peripheral blood lymphocytes to several bacterial antigens and a decrease in absolute numbers of CD4-positive cells in peripheral blood have been also reported (Raber-Dulacher et al., 1994). High levels of progesterone and estradiol-17 β are believed to affect the development of localized inflammation by stimulating the production of prostaglandins, the mediators of the inflammatory response, mainly prostaglandin E₂. It is also been suggested that high levels of progesterone downregulates IL-6 production, rendering the gingival less efficient at resisting the inflammatory challenges produced by bacteria (Amar & Chung, 1994; Raber-Dulacher et al., 1994).

The salivary levels of *mutans streptococci* and IgA concentrations have been found to increase in pregnancy (Laine, 2002). Any changes in dietary habits, such as smaller meals at more frequent intervals because of the increased energy demands of this period, may favor the growth of acidogenic microbes also after delivery (Montandon et al., 2001; Laine, 2002). In spite of caries being a multicausal etiology disease, so that no factor alone has any significant role in the development of caries, it is important to consider that pregnancy-related changes in saliva may promote the development of caries in mothers with other risk factors (Villagrán et al., 1999; Laine, 2002; Fejerskov, 2004).

The oral assistance based on the "Promotion Model of Oral Health", aims at an integrated approach appropriate to the individual, based primarily on educational

and preventive measures (Brambilla et al., 1998; Zanata et al., 2003; Lydon-Rochelle et al., 2004).

Important strategies in modern concepts of prevention have been achieved. This approach, called primary prevention, includes prophylactic measures that are provided to pregnant women in order to prevent dental caries and gingivitis (Günay et al., 1998). In some studies, it has been observed that the majority of pregnant women receive no instructions during pregnancy regarding oral hygiene, even though this is a phase during which women seek out more instruction, which physicians and dentists should take full advantage of, as an opportunity to introduce preventive programs to individuals and groups (Günay et al., 1998; Zanata et al., 2003). The information and motivation of pregnant women is the foundation required for passing on health knowledge to an entire family.

Further evidence supporting prophylactic measures already being used by pregnant women has come from studies of mother preventive programs (Brambilla et al., 1998; Günay et al., 1998; Gomez et al., 2001; Zanata et al., 2003).

Since the desirability of preventive programs starting in pregnant women has been proven, and several studies have already demonstrated a marked improvement in the oral health of mothers, the purpose of this study was to introduce a simple, low-cost intervention on pregnant women enrolled in Integrated Program of Women's Health Attention (IPWHA) of Municipal Health Maternity of Pará de Minas, MG, Brazil; and evaluate, along first until third gestational trimester, their effectiveness.

Materials and methods:

The study described herein was a prospective study, conducted in Municipal Health Maternity Service of Pará de Minas, MG, Brazil.

1: Study population:

The target population was composed entirely of pregnant women that were in the first trimester of gestation, enrolled in the prenatal service of an Integrated Program of Women's Health Attention (IPWHA) of Municipal Health Maternity Service of Pará de Minas, MG, Brazil, from December 2004 until May 2005.

Excluded from the study were pregnant women exhibiting systemic alterations, chronic users of medication, who had smoking and/or alcoholic habits, as well as those that presented advanced periodontal disease, according to American Periodontology Association's criterion, 2000 (Armitage, 2004).

One hundred and five systemically healthy women, primiparous or multiparous, were eligible for this study. All of the patients voluntarily participated in the study, following an explanation of its purpose and objectives. Each participant completed informed consent forms and the study protocol was approved by the Committee of Ethics and Research of the Federal University of Minas Gerais (COEP-UFMG: ETIC 492/04).

2: Data collection:

Baseline data on the oral health conditions of subjects were obtained using hygienic, dental and periodontal indices, besides the collection of stimulated saliva, which were carried out as explained below.

Visible Plaque Index (VPI) was recorded according Loe & Silness (1967).

DMFT index (decayed, missing and filled teeth) and DMFS index (decayed, missing and filled surfaces) were recorded using a dental probe and dental mirror, following epidemiological criteria of World Health Organization (WHO,1999). Additionally, the number of active white spot lesions (AWSL) was visually counted under good illumination. In contrast with healthy enamel, which does not show differences in surface translucence 5 or 10 seconds after drying, with AWSL, white opaque spots are distinctly visible, even when the tooth is wet. On smooth tooth surfaces, they show a white demineralization parallel to the gingival margin and either close (within 1 mm), or in contact with it. They show a chalky aspect, white or light brown in color, without shine. The white opacity is usually covered with plaque and may be detected in adjacent teeth. Pits and fissures areas were diagnosed as carious when they were coloured light or dark brown at the base and/or white change (demineralization) on their side (Ekstrand et al., 2003; Nyvad, 2004). No x-rays were taken.

The American Academy of Periodontology criteria (Armitage, 2004) were used to recording bleeding on probed (BP), probing depth (PD), clinical attachment level

(CAL). The clinical examination was carried out with a dental mirror and a North Caroline University periodontal probe (Hu-Friedy).

The salivary flow-rate (SF) was measured by the collection of stimulated saliva method. The participants were instructed not to eat or drink for 90 minutes before the moment for saliva collection. All assessments were performed at a predefined time of the day, in the mornings, in order to minimize fluctuations related to a circadian rhythm of salivary secretion and composition. The patient was asked to chew an inert material for one minute. After that time, the patient discarded the saliva produced and continued chewing for more five minutes, with the saliva being continually accumulated, then collected in a pre-weighed plastic tubes. After five minutes, the stimulated saliva samples were weighed to calculate flow rates, assuming the specific gravity of saliva of 1,0 g/cm³ (Kalk et al., 2001).

All clinical exams during the three trimesters were blinded and recorded by the same previously trained examiner. Interexaminer calibration exercises were conducted according to the discipline of the Clinical Department of Primary Care of the Federal University of Minas Gerais (UFMG) following two stages to practice consistency in examination and diagnosis of active carious lesions and periodontal disease. Examiner reliability, assessed by weighted Kappa scores, was greater than 85%, thereby considered a good concordance level. Intraclass correlation coefficients were 0.81.

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Treatment was guaranteed by the local service itself, for all the pregnant women examined, prioritized according to the criteria of their needs. Initially, a simple intervention was done, aiming the elimination of infection sites through and sealing of cavities in anterior and posterior teeth with glass ionomer cement Vidrion R (SS White Ltd., Rio de Janeiro, Brazil) and zinc oxide-eugenol cement IRM (Dentisply Ltd., Petropolis, RJ, Brazil), respectively.

2.1: Implementation of primary oral care measures:

For primary oral care measures be implemented, all the pregnant women studied were classified in groups, according to their oral conditions: Group 1= healthy group, without caries and gingivitis and/or light to moderate periodontal disease; Group 2= presence of active white spot lesions and absence of gingivitis and/or light

to moderate periodontal disease; Group 3= presence of gingivitis and/or light to moderate periodontal disease and absence of active white spot lesions; Group 4= presence of active white spot lesions and gingivitis and/or light to moderate periodontal disease. The control measures for caries and periodontal diseases were established for each group described above (Table 1). Besides these measures, all pregnant women received Education for Oral Health (EOH) individually, learning about eating habits and oral hygiene.

These primary oral care measures were implemented from the 13th gestation week until 23rd week. At least 28 days after conclusion of these measures, new data were collected and properly recorded according to clinical protocol, following the same criteria and methods employed in the first trimester. According to the findings, the participants were reclassified among the groups G1-G2-G3-G4 and, again submitted to the primary oral care measures T1-T2-T3-T4 (Table 1). At this stage, around the 24th gestational week, in order to learn the dietary habits of the population in study, the pregnant women were instructed how to keep a personal dietary diary, relating all food and beverages consumed, with their quantities and their respective schedules. They were asked to maintain their normal dietary habits during the recording period.

After recording dietary habits, the researcher counted the episodes of sucrose consumption. Soon after, the researcher gave advice on diet, establishing dietary options.

Around the 32nd gestational week, all participants were re-examined using the earlier criteria, and according to the findings, they were, once again, reclassified among the groups G1-G2-G3-G4.

All primary oral care measures proposed for the study herein were applied by two dentists that work for the health institution cited, and who had previously been trained according to the techniques described.

3: Statistical Analyses:

In order to compare the periodontal parameters (teeth/surface), VPI, AWSL, DMFT and DMFS along three trimesters, the Friedman test was applied, which is a non-parametric test. A Chi-square test was used to check the salivary flow rate and

incidence of plaque along the gestational period. Fisher's test was used to compare independent groups as to how often a certain event occurs.

For all analyses, the level of significance was set at 5%.

Results

Only data from pregnant women who attended all of the sessions were included for statistical analysis. Of 105 mothers present at baseline, 67 completed the study.

Table 2 shows the periodontal disease indicators such as bleeding on probing, probing depth and clinical attachment level of the study population during all gestational trimesters. The percentage of mothers, teeth and surfaces with gingivitis and/or light to moderate periodontal disease showed constant decrease between the first and third trimesters.

A statistically significant improvement in visible plaque index scores was observed between the first and second trimester ($p < 0.001$). The visible plaque index showed a constant decrease through the third trimester (Table 3). At baseline, the visible plaque index score was low in 34.3% of the participants. After the introduction of primary oral care measures, the percentage of mothers with low visible plaque index was 74.6% and 89.6% during the second and third trimesters respectively (Chi-square test, $p < 0.001$).

There was also a statistically significant decrease in the indicators of gingivitis and light to moderate periodontal diseases scores such as bleeding on probing, probing depth and clinical attachment level values from the first, to the second and third trimester ($p < 0.001$) (Table 4).

The caries experience of the patients was described by mean values of the DMFT index (11.6) and DMFS index (26). The mean number of decayed surfaces among the expectant mothers was 0.8, at baseline. Taking into account the initial lesions (AWSL) separately, 31.4% of the participants showed this alteration in the first trimester. The comparison of the active carious lesions between the first and third trimesters showed a statistically significant decrease following primary oral care

therapy. A total of 11 pregnant women showed AWSL at baseline. Among these, only five showed AWSL in the third exam. There were no new lesions of AWSL between first, second and third trimester (Table 5).

Diet analysis was accomplished by means of counting the events of sucrose ingestion. A total of 70.6% of the participants were found to have cariogenic diet habits.

Comparing the three trimesters, the differences of stimulated salivary flow rate was found to be not statistically significant ($p>0.001$). More than half of the pregnant women showed a normal flow rate throughout pregnancy (Figure 1).

As Figure 2 shows, the distribution of the pregnant women in the study groups changed after the implementation of primary oral care measures during the three trimesters, evidencing an increased number of orally healthy pregnant women (G1).

Discussion

A total of 67 pregnant women completed the study. The loss of 40% of the sample is foreseen in prospective epidemiological studies (Levy & Lemeshow, 1991). In the present study, 36% of the sample was lost to follow-up during the studied period. It mainly occurred due of choosing other prenatal care assistance, spontaneous abortion and no interest in further participation.

The implementation of primary oral care measures to control caries and periodontal diseases is reported by various researchers (Brambilla et al., 1998; Günay et al., 1998; Torres et al., 1999; Soderling et al., 2000; Gomez et al., 2001; Yalcin et al., 2002a; Zanata et al., 2003; Lieff et al., 2004; Habashneh et al., 2005). The oral diseases control measures adopted in this study was based on scientific evidences and in the principles established by Oral Health Division of Brazilian Health Department. According these principles, the procedures of primary care are routinely undertaken in public services and provide easy access to the population studied. However, in the evaluated public institution does not treat advanced periodontal

disease, but rather outsources such care to a referenced service providers, resulting in the exclusion of such patients from the current study (Armitage, 2004).

In the present study, initial periodontal therapy, consisting of scaling and root planning, resulted in an improvement on clinical parameters including visible plaque index, bleeding on probing, probe depth and clinical attachment level. These results agree with previous studies of pregnant women (Yalcin et al., 2002a; Zanata et al., 2003). When the study begun, 74.6% of the pregnant women required some type of periodontal treatment. Strictly minimal procedures, scaling and root planning, had a positive impact on oral health of the participants. Nevertheless, at the end of the research, signs of inflammation persisted in 40.3% of the patients. Yalcin et al. (2002b), in a study of pregnant women, evaluate 61 mothers during their first, second and third trimesters, and showed that plaque index and periodontal parameters gradually increased following the gestation, although oral hygiene instructions were given to the entire population studied. It is known that increased levels of circulating progesterone cause dilation of gingival capillaries, permeability and gingival exudate, which may explain the redness and increased bleeding tendency during pregnancy (Löe & Siilness, 1963; Raber-Durlacher et al., 1994). Along these lines, it is interest to consider that nasal mucus predisposes the nose to spontaneous hemorrhage during pregnancy and “pregnancy rhinitis” is thought to be the result of swelling, in addition to increased vascular congestion (Topozada et al., 1982; Hansen et al., 1986).

Some authors also report that the elevated hormone levels characteristic of pregnancy affected the gums more than periodontal attachment (Samant et al., 1976; Tilakaratne et al., 2000). However, Lief et al. (2004) observed a significant increase in frequency of women having four or more sites with attachment loss $\geq 2\text{mm}$ or $\geq 3\text{mm}$, which may represent active periodontal infection accelerated by pregnancy. It is acknowledged the existing controversy over what constitutes true periodontal disease, but the underlying pathophysiology between oral infection and adverse pregnancy outcome is under investigation. Lief et al. (2004) theorize that maternal periodontal disease represents a continuum of exposure to oral pathogens such as Gram-negative anaerobic bacteria occupying the tooth-associated biofilm under the

gums that, likely, involves bacteria- induced activation of cytokine and other proinflammatory mediators. However, it is unknown what level of clinical periodontal disease represents enough exposure to oral microbes to have an impact on the outcome of pregnancy. Similar to Lieff's study, Miyazaki et al. (1991) reported similar percentages of signs of periodontal disease in pregnant and non-pregnant women. Although it was noted that overall rates of disease were high, the proportion of women with PD >4mm increased with each month of pregnancy, and the proportion with PD >4mm was significantly greater among pregnant than non-pregnant women. In this way, pregnant women can be considered patients with a temporary, but higher than normal risk of developing periodontal complications (Yalcin et al., 2002b).

In contrast, another study of pregnant women, (Yalcin et al., 2002a) evaluated the effects of periodontal treatment on clinical indices in the first through the third trimester of pregnancy. They found an improvement in clinical parameters and, also, a statistically significant decrease in levels of prostaglandin E₂ during the second and third trimesters following periodontal therapy. Fortunately, those authors had the chance to observe an improvement in clinical status at the end of the pregnancy period. However, controlled studies with larger numbers of pregnant individuals might be required in order to establish more definitive statistical and clinical significance (Yalcin et al., 2002a).

The impact of primary oral care measures on control of active carious lesions, shows significance, as 31.4% of the participants showed AWSL in the first trimester, and this number decreased through the entire period of the pregnancy's preventive health care program (9%). The efficacy of caries preventive measures in mothers consisting of dietary counseling, fluoride preventive regimens, professional prophylaxis and oral hygienic education sessions are widely reported in the literature (Brambilla et al., 1998; Günay et al., 1998; Torres et al., 1999; Söderling et al., 2000; Gomez et al., 2001; Zanata et al., 2003). In the present study, no increment of initial carious lesions was reported. It is important to recall that the mean period of caries development varies from months to years. Between the initiation of caries and the involvement of dentin in the decay process, there is ample time for a preventive management strategy. Thus, successful results were expected for the present study,

since it ran from early pregnancy (12 weeks) until the third trimester (32 to 36 weeks of pregnancy), which represented only a 5 to 6 month period of time. It is considered a relatively short period of time to evaluate exacerbation of caries, even considering the influences of pregnancy, whether hormonal or immunologic. So, it would be enlightening to study a group of postpartum women to see if any of these problems were resolved or improved. This is in agreement with similar clinical studies (Villagrán et al., 1999; Lieff et al., 2004).

Oral health education sessions were held during the first, second and third trimester of pregnancy. When the participants were in the 20th to 27th gestational weeks, they were instructed about the importance of optimal nutrition and dietary behaviors, since the majority of the mothers showed highly cariogenic diet habits (70.6%). The relationship between nutrition and dental health is often overlooked during pregnancy, infancy and early childhood for 2 reasons: most dietitians and pediatricians lack the training to make preventive or therapeutic oral health recommendations, and dental professionals may lack the dietary counseling skills to assess and provide appropriate nutritional interventions (Fitzsimons et al., 1998). Similar to other studies, dramatic dietary changes are necessary to control sucrose consumption are associated with a significant reduction in the mother-child transmission of mutans streptococci (Günay et al., 1998; Brambilla et al., 1998; Villagrán et al., 1999; Torres et al., 1999; Söderling et al., 2000; Gomez et al., 2001; Zanata et al., 2003).

The stimulated salivary flow rate was compared from the first through the third trimester and did not show statistically significant differences between these three periods. More than half of participants showed a normal salivary flow rate during the entire pregnancy. Some authors affirm that the number of some microorganisms can increase during the pregnancy together with a decrease in the salivary flow rate, pH and buffer capacity (Salvoline et al., 1998; Laine, 2002). Although, it is suggested that the composition of human saliva is influenced by female sex steroids during pregnancy, conflicting results about salivary flow rates still persist. Relatively few studies have been made of the flow rate of whole saliva in pregnant women. Longitudinal studies, however, have shown no significant changes

in the flow rate of paraffin-stimulated whole saliva (Laine et al., 1988; Laine et al., 2000), despite changes in salivary composition (Laine et al., 1988; Salvoline et al., 1998). Other reports in the literature show that pregnant women may also notice either a dry mouth (xerostomia) or excess saliva production (ptyalism) (ADA, 1995; Torres et al., 1999). In almost one third of participants of this study, salivary flow rates were measureably low. Leone and Oppenheim (2001) provide a systematic review of the clinical evidence establishing the role of saliva in protecting individuals against caries, and, on the basis of twenty-one studies, chronically low salivary flow rate was found to be the strongest indicator of an increased risk for caries prevalence or incidence. However, it is important to reinforce that other salivary parameters are correlated to caries development. Caries is a multifactorial disease, of which salivary parameters represent only a fraction of all contributing factors (Leone & Oppenheim, 2001).

There were changes in the number of pregnant women in the groups from the first to third exam, a fact that contributed to reinforce the positive effects of the proposed measures. The group of pregnant women with no oral diseases increased during this study (G1) and the group of mothers with periodontal disease and active caries was reduced (G4). Although a decrease in participants with only periodontal disease (G3) was observed, 37.3% of them still showed some type of periodontal alteration by the end of this study. That result emphasizes the importance of periodontal disease in pregnant women and leads to important reflections regarding the role of systemic and behavioral factors, characteristic of pregnancy, in the development of this condition.

In conclusion, it is important to consider that periodontal disease has been being cited as a risk factor for pregnant women and for their babies, and without intervention can result in pre-term, low birthweight babies (Offenbacher et al., 1996; Dasanayake, 1998; López et al., 2002). Additionally, other studies have shown associations between periodontal disease and pregnancy such as increased risk for development of preeclampsia during pregnancy (Boggess et al., 2003). Despite the current lack of strong scientific evidence for these results, they should lead the dental community to practice regular professional care throughout the gestational period.

Therefore, a preventive care program for pregnant women should aim a rigorous plaque control, combined with regular professional care and oral health education programs.

Conclusions

- At baseline, 74.6% of pregnant women showed gingivitis and/or light to moderate periodontal disease; 31.4% showed activity white spot lesions, with means of DMFT and DMFS of 11.6 and 26 respectively.
- The majority of pregnant women showed a cariogenic diet habit (70.6%).
- The implemented measures were effective for control of caries and periodontal diseases, evidenced by a reduction in clinical measurements of visible plaque index, bleeding on probing, probing depth, clinical attachment level and caries activity.

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Table 1: Caries and periodontal disease control measures according to oral health conditions of pregnant women:

Oral Health Conditions	Control measures
Group 1 Absence of caries and periodontal disease	Oral Health Education Sessions + Supervised Oral Hygiene at each stage of the study (first through third trimester).
Group 2 Presence of AWSL and absence of periodontal disease (GLMPD)	Oral Health Education Sessions + Supervised Oral Hygiene and topical fluoride gel (fluoride phosphate – 1.23%), once a week during four weeks.
Group 3 Absence of AWSL and presence of periodontal disease (GLMPD)	Oral Health Education Sessions + Supervised Oral Hygiene and professional prophylaxis measures (scaling and root planning). The number of sessions was determined by the necessary to complete removal of supra- and sub-gingival calculus.
Group 4 Presence of AWSL and periodontal disease (GLMPD)	Oral Health Education Sessions + Supervised Oral Hygiene, professional prophylaxis measures (scaling and root planning), and topical fluoride gel (fluoride phosphate – 1.23%), once a week during four weeks.

Table 2: Percentiles of pregnant women with Bleeding on Probing (BOP), Probing Depth (PD<6mm) and Clinical Attachment Level (CAL<4mm) among three trimesters

Sample unit	Trimester	Parameter (%)		
		BOP	PD(>4mm < 6mm)	CAL(< 4mm)
Individual (67)	First	74.6	71.6	74.6
	Second	61.2	55.2	58.2
	Third	34.3	43.3	46.3
Teeth (1821)	First	19.7	11.3	11.6
	Second	8.6	6.1	6.5
	Third	3.4	3.4	3.9
Surface (7254)	First	6.5	3.7	3.8
	Second	2.4	1.8	2.0
	Third	0.9	0.9	1.1

Table 3: Differences among Medians of Visible Plaque Index regarding three trimesters

Trimester	Minimum	Maximum	Median	p
First	8.3	98.6	46.4	< 0.001 T ₁ > T ₂ > T ₃
Second	1.0	58.3	25.8	
Third	5.0	59.7	21.3	

Note: The p value refers to the Friedman test

Table 4: Comparison of Medians of Percentiles regarding Bleeding on Probing (BOP), Probing Depth (PD>4mm,<6mm) and Clinical Attachment Level (CAL<4mm) among three trimesters

Unit/ Parameter	Min	Max	Median	P (p value refers to the Friedman test)
BOP				
Surface				
First	0.0	91.7	4.5	< 0.001
Second	0.0	12.5	1.6	$T_1 > T_2 > T_3$
Third	0.0	6.9	0.0	
Tooth				
First	0.0	91.7	16.7	< 0.001
Second	0.0	38.9	6.5	$T_1 > T_2 > T_3$
Third	0.0	22.2	0.0	

PD	Min	Max	Median	P
Surface				
First	0.0	22.2	1.9	< 0.001
Second	0.0	23.6	0.8	$T_1 > T_2 > T_3$
Third	0.0	9.7	0,0	
Tooth				
First	0.0	55.6	7.1	< 0.001
Second	0.0	61.1	3.3	$T_1 > T_2 > T_3$
Third	0.0	27.8	0,0	

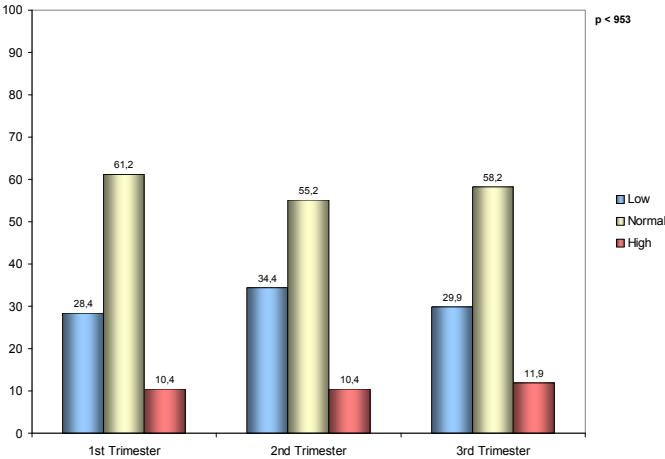
CAL	Min	Max	Median	P
Surface				
First	0.0	23.6	2.1	< 0.001
Second	0.0	25.0	0.9	$T_1 > T_2 > T_3$
Third	0.0	11.1	0.0	
Tooth				
First	0.0	55.6	7.1	< 0.001
Second	0.0	61.1	3.3	$T_1 > T_2 > T_3$
Third	0.0	33.3	0.0	

Table 5: Comparison of Medians of Active White Spot Lesions (AWSL) among three trimesters

Trimester	Min	Max	P ₂₅	Median	P ₇₅	p
First	0.0	11.0	0.0	0.0	2.0	< 0.001 $T_1 > T_2 > T_3$
Second	0.0	9.0	0.0	0.0	0.0	
Third	0.0	5.0	0.0	0.0	0.0	

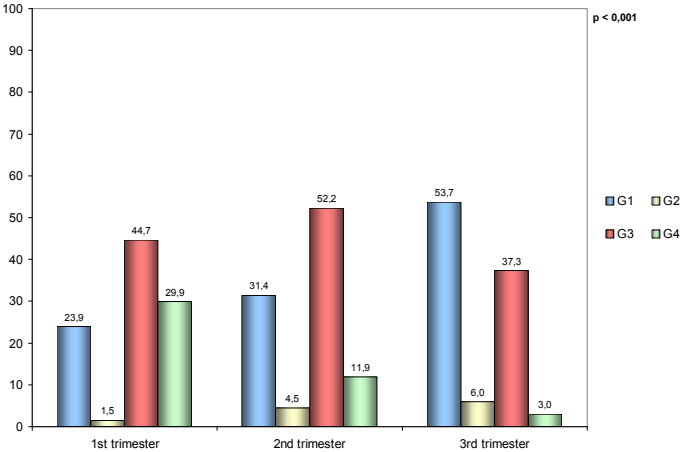
Note: The p value refers to the Friedman test

Figure 1: Salivary Flow Characterization of the Pregnant Women throughout their Gestational Period



Note: The p value refers to the Chi-square test

Figure 2: Characterization of the Pregnant Women throughout Gestational Period according to Caries and Periodontal Disease Classification



Note: The p value refers to the Fisher exact test

5. CONSIDERAÇÕES FINAIS

A inclusão da assistência odontológica durante o pré-natal foi estabelecida em 1988, adicionando-se às demais ações desenvolvidas no Programa de Humanização no Pré-Natal e Nascimento do Programa Integral à Saúde da Mulher¹. A Divisão Nacional de Saúde Materno-Infantil reconhece a relevância da educação em saúde e afirma que “...as gestantes constituem o grupo ideal para que o processo de aprendizagem se realize”. Com relação à assistência odontológica, especificamente no pré-natal, este mesmo documento do Ministério da Saúde, declara que “... todas as gestantes inscritas deverão ser agendadas para consulta de rotina nas unidades de saúde, que disponham de serviço odontológico; caso contrário referenciar. Na consulta de rotina, deverá ser realizado o exame clínico da cavidade bucal e elaborado um plano de tratamento a ser desenvolvido durante o pré-natal”.

Este mesmo documento (Brasil, 1988), que serve de orientação às Secretarias de Saúde e, conseqüentemente, aos serviços de pré-natal, afirma também que “...deve-se aproveitar o período da gestação para introduzir ações educativas em saúde bucal.”

Assim, melhorar e manter o estado de saúde da mulher requerem a integração da ação governamental, das associações dos profissionais da área de saúde, das corporações privadas, dos centros acadêmicos de saúde, da pesquisa e das próprias mulheres (Lydon-Rochelle et al., 2004).

Se por um lado a gravidez é enfatizada como o momento oportuno para a mulher incorporar novos hábitos e práticas, com benefícios para si mesma e refletindo positivamente em todo ambiente familiar (Günay et al., 1998), por outro lado, é considerada como um estado temporário de equilíbrio instável devido às perspectivas de mudanças em seu papel social, às necessidades de novas

¹ FONTE: Ministério da Saúde, (Brasil, 1988)

adaptações, reajustamentos inter-pessoais e intra-psíquicos, mudança de identidade e grande cobrança social (Maldonado, 1986, Casamassimo, 2001).

No presente estudo, foi observado que, embora as gestantes se mostrassem motivadas a incorporar-se ao programa proposto de acompanhamento da saúde bucal, durante todo o período gestacional, muitas o abandonaram ao longo da evolução da gestação. Das 105 gestantes que iniciaram o programa, 67 o concluíram. As perdas foram motivadas, sobretudo pela escolha de outro serviço de assistência pré-natal, por aborto espontâneo, ou por desinteresse em continuar participando.

O desinteresse pela atenção odontológica pode estar associado ao desconhecimento de muitas gestantes quanto à importância da manutenção do estado de saúde bucal, da prevenção de intercorrências gestacionais, da redução da transmissibilidade intrafamiliar dos microorganismos, bem como da sua atuação como agente multiplicadora de saúde (Habashneh et al., 2005). Bernd et al. (1992) identificaram, no relato de gestantes, dois níveis de dificuldades que devem ser superadas para chegar ao dentista. O primeiro é interno, subjetivo e diz respeito a seus medos, traumas e fantasias. O segundo é externo, objetivo e se relaciona com as dificuldades de marcação de consultas, esperas prolongadas, interferências do cotidiano.

Analisando as características sócio-demográficas, os fatores relacionados a episódios da gravidez e os hábitos de higiene bucal das gestantes estudadas, observou-se que o grupo apresentou uma distribuição heterogênea. Ao relacionar essas variáveis com os parâmetros clínicos de higiene (Índice de Placa Visível), parâmetros periodontais (Sangramento a Sondagem, Profundidade a Sondagem e Nível Clínico de Inserção), experiência e atividade de cárie, e fluxo salivar estimulado, apenas o hábito de usar fio dental e o sangramento à sondagem apresentaram relação significativa. Investigações que empregaram metodologia e amostragem similares às deste estudo revelaram associações significativas entre os

parâmetros periodontais e algumas variáveis como nível educacional e assistência odontológica prévia (Machuca et al., 1999; Yalcin et al., 2002b). Por outro lado, um estudo que acompanhou um número maior de gestantes, encontrou associações estatisticamente significativas entre parâmetros periodontais e características sócio-demográficas como idade, etnia, hábito de fumar e cobertura por serviço de saúde (Lief et al., 2004). Ainda que consideradas as restrições econômicas e práticas impostas ao seu desenvolvimento, estudos mais amplos são necessários, a fim de evidenciar os possíveis efeitos das associações clínicas e sócio-demográficas, empregando métodos mais refinados de análise estatística.

As medidas de controle implementadas neste estudo apresentaram um impacto positivo na condição de saúde bucal das gestantes, corroborando a importância de se conceber programas de atenção básica ao grupo de gestantes, caracterizados pela simplicidade de ações, acessibilidade e relação custo-benefício favorável.

O caráter interdisciplinar da atenção é essencial para alcançar a plenitude da saúde, e o período de gestação ressalta-se como momento privilegiado para ações dessa natureza, em virtude de encontrarem-se as gestantes mais susceptíveis a mudanças de hábitos e costumes arraigados. É necessário, também, que o cirurgião-dentista ocupe o espaço que lhe cabe na formação de equipes envolvidas nos programas de acompanhamento de pré-natal.

A condição de saúde das mulheres grávidas é resultado de toda uma vida e a gestação não as transforma em seres diferentes, com demandas específicas. São, na verdade, mulheres de diferentes origens, mas mulheres cidadãs, dignas de seus direitos (Roncalli, 2000). Se ainda não se mobilizaram pela importância da saúde bucal para seu bem estar geral, pode ser a gestação, o momento oportuno para despertá-las, devido às características biopsicossociais inerentes ao processo reprodutivo.

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APÊNDICE 1



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24th March 2006

Dear Dr Burt,

Enclosed you can find the paper entitled "**Impact of Primary Care in Caries and Periodontal Disease: prospective study in Brazilian Pregnant Women**" for your appreciation and possible publication in *Community Dentistry and Oral Epidemiology* Journal. The authors affirm that the documents are unpublished and the exclusiveness preserved until the knowledge regarding the journal's decision. If the article is accepted, the reproduction outcomes belong to exclusive property of this journal.

Yours sincerely,

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To editor-chief,

Enclosed you can find the paper entitled “**The Influence of Clinical and Socio-Demographic Variables on the Oral Health of Brazilian Pregnant Women**” for your appreciation and possible publication in *Oral Health & Preventive Dentistry* Journal. The authors affirm that the documents are unpublished and the exclusiveness preserved until the knowledge regarding the journal's decision. If the article is accepted, the reproduction outcomes belong to exclusive property of this journal.

Yours sincerely,

Cláudia Silami de Magalhães

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APÊNDICE 2

PRONTUÁRIO CLÍNICO

Nome _____
Período de Gestação _____ em _____ Médico _____
Data de nascimento _____ Idade _____ Estado civil _____
Profissão _____ Escolaridade _____
Endereço _____ Bairro _____
CEP _____ Cidade _____ Estado _____
Telefone _____

Razão da visita ao dentista

Fez tratamento odontológico no último ano? () Sim () Não
Qual? _____

Está temerosa em receber o tratamento odontológico? () Sim () Não

Você e/ou sua família receberam orientações e medidas preventivas para
manutenção da saúde bucal? () Sim () Não

Tem o hábito de beber e/ou de fumar? () Sim () Não

Primigesta ()

Multigesta ()

História Médica

Fez tratamento médico no último ano? () Sim () Não

Qual motivo? _____

Médico: _____

Tomou as vacinas necessárias? () Sim () Não

Antes da gravidez, teve alguma doença mais grave? () Sim () Não

Qual: _____

Esteve internada no hospital? () Sim () Não

Já fez transfusão de sangue? () Sim () Não

Esteve em contato com alguém portador de:

() Rubéola () AIDS () Tuberculose () Caxumba

() Sarampo () Hepatite () Catapora () Hanseníase

() Outra: _____

Marque caso presente o apresentou alguma das doenças abaixo:

- | | | |
|--|---|---------------------------------------|
| <input type="checkbox"/> Diabetes | <input type="checkbox"/> Pneumonia | <input type="checkbox"/> Hemofilia |
| <input type="checkbox"/> Asma | <input type="checkbox"/> Sarampo | <input type="checkbox"/> Problemas de |
| <input type="checkbox"/> Doença cardíaca | <input type="checkbox"/> Hepatite | tireóide |
| <input type="checkbox"/> Bronquite | <input type="checkbox"/> Pressão Alta | <input type="checkbox"/> Rubéola |
| <input type="checkbox"/> Alergias | <input type="checkbox"/> Tuberculose | <input type="checkbox"/> Reumatismo |
| <input type="checkbox"/> Doença
neurológica | <input type="checkbox"/> Problema de rins | <input type="checkbox"/> Outra |
| | <input type="checkbox"/> Sífilis | |

Tomou algum remédio? Sim Não
Qual?

Há quanto tempo?

Já tomou algum remédio que lhe fez mal? Sim Não
Qual motivo?

Na família (pai, mãe, avós, tios) existe algum problema de saúde, tais como alergia, diabetes, pressão alta, discrasias sangüíneas, problemas de coração?

Sim Não
Qual?

Já foi alguma vez tratada de anemia? Sim Não

Tem tonturas de vez em quando? Sim Não

Tem desmaios ou convulsões? Sim Não

Os tornozelos incham de vez em quando? Sim Não

Quando se corta, o sangue demora a coagular? Sim Não

Avaliação da Higiene

Gosta de escovar os dentes? Sim Não
Frequência _____

Já ensinaram como escovar Sim Não

Usa fio dental Sim Não Às vezes

Já fez aplicação de flúor Sim Não

Pasta de dente que usa _____

Há alguma informação que julga necessária para podermos oferecer-lhe um tratamento mais adequado?

Pará de Minas, _____ de _____ de _____

Assinatura do responsável

Avaliação Clínica

1. ÍNDICE DE PLACA VISÍVEL

Dados registrados no primeiro trimestre da gravidez

Data ___/___/___

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
V																
L																
M																
D																

	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
V																
L																
M																
D																

Dados registrados no segundo trimestre da gravidez

Data ___/___/___

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
V																
L																
M																
D																

	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
V																
L																
M																
D																

Dados registrados no terceiro trimestre da gravidez

Data ___/___/___

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
V																
L																
M																
D																

	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
V																
L																
M																
D																

Valores válidos: 0= sem placa

1= com placa

X= ausente

2.CONDIÇÃO PERIODONTAL

1º Trimestre

Data: ____ / ____ / ____

Dente	Profundidade à Sondagem				Perda de Inserção				Sangramento à sondagem			
	D	V	M	L	D	V	M	L	D	V	M	L
18												
17												
16												
15												
14												
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12												
11												
21												
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31												
41												
42												
43												
44												
45												
46												
47												
48												

2º Trimestre

Data: ____ / ____ / ____

<i>Dente</i>	<i>Profundidade à Sondagem</i>				<i>Perda de Inserção</i>				<i>Sangramento à sondagem</i>			
	D	V	M	L	D	V	M	L	D	V	M	L
18												
17												
16												
15												
14												
13												
12												
11												
21												
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41												
42												
43												
44												
45												
46												
47												
48												

3º Trimestre

Data: ____ / ____ / ____

<i>Dente</i>	<i>Profundidade à Sondagem</i>				<i>Perda de Inserção</i>				<i>Sangramento à sondagem</i>			
	D	V	M	L	D	V	M	L	D	V	M	L
18												
17												
16												
15												
14												
13												
12												
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47												
48												

3. CONDIÇÃO DENTÁRIA (CPO-D CPO-S lesão de mancha branca ativa)

Notação segundo determinação da OMS:

C	<i>CARIADOS</i>
P	<i>PERDIDOS: E- extraídos</i> <i>Ei-extração indicada</i>
O	<i>RESTAURADOS</i>

- **MBA = MANCHA BRANCA ATIVA**

Primeiro Trimestre

Data ___/___/___

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
v																
M																
L																
D																
O																

	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
v																
M																
L																
D																
O																

TPE	C	P (E)	P (Ei)	O	CPO-D
TPE	C	P (E)	P (Ei)	O	CPO-S

- TPE: total de dentes permanentes eruídos

Segundo Trimestre

Data ___ / ___ / ___

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
v																
M																
L																
D																
O																

	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
v																
M																
L																
D																
O																

TPE	C	P (E)	P (Ei)	O	CPO-D
TPE	C	P (E)	P (Ei)	O	CPO-S

Terceiro Trimestre

Data ___ / ___ / ___

	18	17	16	15	14	13	12	11	21	22	23	24	25	26	27	28
v																
M																
L																
D																
O																

	48	47	46	45	44	43	42	41	31	32	33	34	35	36	37	38
v																
M																
L																
D																
O																

TPE	C	P (E)	P (Ei)	O	CPO-D
TPE	C	P (E)	P (Ei)	O	CPO-S

5. SALIVA:

Mês de gestação	Primeiro trimestre	Segundo trimestre	Terceiro trimestre
Fluxo salivar ml/min			

APÊNDICE 3

Diário Dietético

Você é convidada a registrar tudo o que foi consumido durante um período de três dias preenchendo o formulário abaixo.

Anote tudo o que for ingerido nas refeições principais e entre elas como refrigerantes, sucos, leite, doces, frutas, gomas de mascar, balas, chocolates e medicamentos.

Registre as porções dos alimentos consumidos utilizando referências como uma xícara de chá, um copo, duas colheres de sopa para maior precisão.

Mantenha seus hábitos alimentares normais, para se fazer uma avaliação com a maior precisão possível. Faça o registro cuidadosamente.

Obrigada,

Natália Coutinho – cirurgiã-dentista responsável

Nome: _____ Período da gestação: _____

1º DIA – DATA

<i>HORA</i>	<i>ALIMENTOS INGERIDOS</i>	<i>QUANTIDADE</i>
Manhã:		
Almoço:		
Tarde:		
Noite:		

2º DIA – DATA

<i>HORA</i>	<i>ALIMENTOS INGERIDOS</i>	<i>QUANTIDADE</i>
Manhã:		
Almoço:		
Tarde:		
Noite:		

3º DIA – DATA

<i>HORA</i>	<i>ALIMENTOS INGERIDOS</i>	<i>QUANTIDADE</i>
Manhã:		
Almoço:		
Tarde:		
Noite:		

O cálculo do índice de consumo de sacarose é realizado por meio do registro da categorização dos alimentos com sacarose quanto à forma e momento da ingestão atribuindo valor 1 aos alimentos líquidos, não retentivos ingeridos junto às refeições principais; e o valor 2 aos alimentos sólidos, retentivos entre as refeições principais. De posse desses dados, é feito o cálculo do índice de consumo de sacarose a partir da multiplicação dos valores correspondentes à forma do alimento pelos valores relacionados ao momento da ingestão. Assim, um alimento retentivo, ingerido entre as refeições principais deve ser considerado como tendo um valor de 4 (2X2), enquanto que o mesmo alimento ingerido à refeição principal, teria valor 2 (2X1). O índice diário aceitável é menor ou igual a sete².

² FONTE: Pordeus,IA; Auad,SM. Uma proposta para avaliação e aconselhamentos dietéticos. Revista do CROMG 2000:6:132-139.