A longitudinal study of the prevalence of gingival bleeding among selected Nigerian pregnant women

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Abstract

Objective: To assess the prevalence of gingival bleeding following gentle periodontal probing during pregnancy as compared to after child birth in the same set of women.
Method: Three hundred and eighty-four consecutive pregnant women in third trimester were selected at the antenatal clinics of Adeoyo Maternity Hospital, and the University College Hospital, both in the city of Ibadan, south western part of Nigeria. An 18-item questionnaire was administered on the subjects to obtain information on their use of oral contraceptive prior to getting pregnant, their experiencing gingival bleeding at any point in time before or during pregnancy and their methods of oral hygiene procedure. This was followed by intra-oral examination to assess the presence or absence of gingival bleeding, which was determined by gentle probing of the gingival crevice with a Community Periodontal Index of Treatment Needs (CPITN) probe. The appearance of bleeding within 10 seconds indicates a positive score. The same set of women were re-examined at two other occasions following child birth.
Result: Seventy-two (20.9%) of the subjects reported that they had been experiencing gingival bleeding during toothbrushing before the study. Two-hundred and sixty-one of the subjects bled during pregnancy and this reduced to 192 and 127 at the 6th and 14th week post-partum examination respectively. There was a statistically significant difference in the gingival bleeding on probing during pregnancy in comparison to the 6th and 14th week post-partum periods respectively (p = 0.000).
Conclusion: The study shows that pregnancy must have played a major role in the tendency for the gingiva to bleed as there was statistically significant reduction in gingival bleeding following parturition.

Key words: Bleeding, gingiva, pregnancy, women

Introduction

Gingival health is assessed by the degree of the inflammatory changes in the tissue. This is done through the visual assessment of the cardinal signs of inflammation including changes in gingival colour, gingival swelling and gingival bleeding following gentle probing of the sulcus with a periodontal probe. Assessment of gingival inflammation using bleeding following gentle probing is more objective than the use of either the colour change or degree of gingival swelling[1]. Gingival bleeding varies in severity, duration and ease of provocation but it is easy to elicit clinically, making it of great value for the early diagnosis and thus prevention of a more advanced gingivitis. Studies have shown that bleeding on probing is one of the earliest signs of gingival inflammation that often precedes change in colour or other visual signs of inflammation[1, 2].

Gingival bleeding following probing can be caused by the presence of bacterial plaque in the gingival sulcus, which stimulates inflammatory reaction in the tissue. However, the incidence of gingival bleeding is reportedly higher in pregnant women when compared with their non-pregnant counterparts and this is attributed to the effect of the hormonal imbalance during pregnancy[3, 4]. Pregnancy is considered to be a modifying factor, which causes the aggravation of pre-existing gingival inflammation as a result of the increased secretion of progesterone and oestrogen. This conclusion is reinforced by the similarity in the gingival changes seen during pregnancy and in women that were on oral contraceptives that contained progesterone for more than two years[5].

In pregnancy-associated gingivitis, the gingiva is dark red and bleeds easily, which is due to the increased vascularity and extravasation of the red blood cells in the area. There is also loss of stippling of the attached gingivae with the oedema-related smooth appearance of the gingivae. Also noticed in pregnancy gingivitis is the thickening of the gingival margin and hyperplastic interdental papillae which is responsible for the formation of pseudo-pockets[6]. The gingival inflammation is usually first noticeable in the second month of pregnancy, which tend to increase in severity until the eight month of pregnancy after which it starts declining. The gingival state following termination of pregnancy is comparable with that of the second month of pregnancy[7, 8]. These findings strengthen the view that pregnancy has a role to play in the inflammation of the gingiva. Therefore, this study was carried out to assess the effect of pregnancy on the prevalence of gingival bleeding, which is an objective method of assessing gingival inflammation, among some Nigerian women.

Materials and method

Three hundred and eighty-four apparently healthy pregnant women were recruited from the ante-natal clinics of the University College Hospital and Adeoyo Maternity Hospital, both in Ibadan, Oyo State. Each of the women was assessed for gingival bleeding once during their third trimester of pregnancy and was followed up for a repeat assessment of the gingival bleeding at the 6th and 14th weeks after child birth. The whole mouth was divided into sextant and gingival bleeding assessed by gently moving a Community Periodontal Index of Treatment Needs (CPITN) probe round each of the teeth in the sextant. The scoring was done based on the presence or absence of gingival bleeding within 10 seconds of the probing. The following teeth within the sextants were chosen as index teeth:

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Approval of the local ethical review committee was obtained before the commencement of the study. The data were analyzed using SPSS version 14.0. Chi square test was used to determine the difference in the number of sites that bled during pregnancy in comparison with those that did following child delivery. Level of statistical significance was set at $p< 0.05$.

Result

During the 14-months study period that spanned between October 2006 and December 2007, 384 pregnant women were examined once during third trimester of pregnancy and at two other occasions (6th and 14th week) after parturition. Thirty-nine of the subjects dropped out from the study leaving 345 of them that completed the study at the 14th week post-partum period. The age range of the subjects was 18-45 years while the mean age was 27.85 (SD + 5.20) years. Eleven (3.2%) of the subjects were younger than 20 years of age, 82 (23.8%) were in the age range 20-24 years, 117 (33.9%) were in the age range 25-29 years while 92 (26.7%) were in the age range 30-34 years. Only eight (2.3%) of the subjects were above 40 years of age **(Table 1).** Two-hundred and thirty-six (68.4%) were in the lower socio-economic class, 91 (26.4%) were in the middle class and the remaining 18 (5.2%) were in high socio-economic class.

Seventy-two (20.9%) of the subjects reported that they had been experiencing gingival bleeding before the study. Fifty-eight (16.8%) of these claimed that the gingival bleeding had been noticed before pregnancy, while the remaining 14 (4.1%) noticed the bleeding for the first time during pregnancy. Forty-three (12.5%) of them were on oral contraceptive before pregnancy but only 8 (2.3%) of them used the drug for up to two years before conception.

During pregnancy, 84 (24.3%) of the subjects did not bleed in any of the sextants and the number increased to 153 (44.3%) and 218 (63.2%) at the 6th and 14th week post-partum examination respectively. Seventy-nine (23.0%) of the women bled in one of the sextants during pregnancy and the number of those that bled in one sextant increased to 85 (24.6%) and 95 (27.5%) during the 6th and 14th week post-partum examination respectively. Nine (2.6%) of them bled in all the sextants during pregnancy which was not seen in any of them during the post-partum examination **(Table 2).** Two hundred and sixty-one (75.7%) of the women bled on probing in at least one of the sextants during pregnancy, while 84 (24.3%) did not. One hundred and ninety-two (55.7%) of the subjects bled on probing in at least one of the sextants during the 6th week post-partum examination, while 153 (44.3%) did not. Among the 84 women that did not bleed during pregnancy, 19 bled at the 6th week post-partum examination, while 88 (25.5%) of those that bled during pregnancy did not bleed at the 6th week post-partum period **(Table 3).** Two hundred and eighteen (63.2%) of the subjects did not bleed at the 14th week post-partum examination, while 15 (4.3%) of those that did not bleed during pregnancy bled during this period **(Table 4).** Using Chi-square with McNemar test, there was a statistically significant reduction in the tendency of the subjects to bleed following gentle probing after the termination of the pregnancy in comparison to that during pregnancy ($p = 0.000$).

Table 1. Age distribution of respondents

Age group (Years)	Frequency	Percentage (%)
15 - 19	11	3.2
20 - 24	82	23.8
25 - 29	117	33.9
30 - 34	92	26.7
35 - 39	35	10.1
>40	8	2.3
Total	**345**	**100**

Table 2. Prevalence of gingival bleeding per sextant among the women during pregnancy and following childbirth

Number of sextants that bled	During pregnancy (%)	6th week post-partum (%)	14th week post-partum (%)
0	84 (24.3)	153 (44.3)	218 (63.2)
1	79 (23.0)	85 (24.6)	95 (27.5)
2	66 (19.1)	70 (20.3)	21 (6.1)
3	46 (13.3)	32 (9.3)	7 (2.0)
4	47 (13.6)	3 (0.9)	3 (0.9)
5	14 (4.1)	2 (0.6)	1 (0.3)
6	9 (2.6)	0	0
Total	**345**	**345**	**345**

Table 3. Comparison of the tendency to bleed on gentle probing of the gingival sulcus during pregnancy and at 6th week post-partum period

Bleeding at 6th week		Post-partum period		Total (%)
		No (%)	Yes (%)	
Bleeding during pregnancy	No	65 (18.8)	19 (5.5)	84 (24.3)
	Yes	88 (25.5)	173 (50.1)	261(75.7)
Total (%)		153 (44.3)	192(55.7)	345(100)

(X^2= 49.091, p = 0.000, Likelihood ratio= 50.406)

Table 4. Comparison of the tendency to bleed on gentle probing of the gingival sulcus during pregnancy and at 14th week post-partum period

		Bleeding at 14th week post-partum period		Total (%)
		No %	Yes %	
Bleeding during pregnancy	No	69 (20.0)	15 (4.3)	84 (24.3)
	Yes	149 (43.2)	112 (32.5)	261(75.7)
Total (%)		**218 (63.2)**	**127 (36.8)**	**345 (100)**

($p = 0.000$, $X^2 = 17.150$, Likelihood ratio = 18.593)

Discussion

This study revealed that although a minority (20.9%) of the subjects admitted that they have been experiencing gingival bleeding during toothbrushing, majority (261 during pregnancy) of them bled in at least one of the examined sites following gentle probing. This is in agreement with the finding by Savage and Arowojolu[9] who reported that 29.8% of the subjects that they studied admit to having noticed gingival bleeding during oral prophylaxis, but examination revealed that none of them had a healthy periodontal status. This could have been due to negligence on the part of the subjects not to have noticed the gingival bleeding during oral prophylaxis or that they were careful enough not to stimulate the bleeding while cleaning their teeth. If the latter reason were to be true, then their toothbrushing would have been ineffective, as the force used in probing the periodontal pocket is similar to that which normally will be exerted during oral hygiene procedure. Some of the subjects could also have seen it as a normal occurrence, which could have informed their not admitting the fact, which was the finding by Savage and Arowojolu[9].

The role of oral contraceptive in the induction of gingival bleeding in these subjects is remote as 35 (81.4%) of the forty-three that admitted using the medication before conception claimed that they used it for less than two-years, within which majority of the studies claimed that there will not be any appreciable effects on the gingivae[5,10-14]. Also, the number that used the medication at all before pregnancy were in the minority (12.5%), which means that the effect of the medication is not likely to be relevant in the tendency for the subjects to bleed following gingival probing in this study. Therefore, the study goes a long way in confirming the role of pregnancy in exaggerating pre-existing gingival inflammation as the tendency to bleed reduced significantly following parturition. This is in agreement with other studies that reported increased severity of gingivitis during pregnancy[7, 15]. The finding in this study is also similar to that of Nuamah and Annan[16] who reported a higher incidence of gingival bleeding among pregnant women as compared with non-pregnant women. However, the finding is in contrast to that of Jonsson et al[17], who reported no significant difference in the bleeding tendency among some men in comparison with menstruating and pregnant women. Two hundred and eighteen (63.2%) of the participants did not bleed in any of the examined sites following child birth. The prevalence of gingival bleeding following child birth (36.8%) among the participants was still high, which suggest that, with or without pregnancy, the prevalence of gingival bleeding and thus inflammation of the gingiva was quite high among the participants. This will be in agreement with the observation that pre-existing gingivitis is made worse during pregnancy[4, 7]. This should be of public health concern that requires more efforts towards the enlightenment of the general population.

Conclusion

It is obvious from this study that there was a great reduction in the tendency to bleed from the gingiva following child birth, though the prevalence of gingival bleeding was still high. Therefore, there is an urgent need for public dental campaign geared towards the sensitisation of women of child-bearing age as to the need to maintain optimal oral health, which can stem the tide of gingival bleeding especially during pregnancy. Incorporating dental health talk into the existing health talk at the antenatal clinic will help in enlightening such women.

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