INTRODUCTION

Gender based hormones are assumed to be a risk factor for gingival disease and can even lead to chronic periodontitis. These hormones are able to flourish periodontal microorganisms and alter host immunologic feedback. In recent researches estrogen has established its role in adjustment of immune response of humans also. Gingival inflammation arises during the menstrual cycle, even if good oral hygiene is preserved. At same plaque index more inflammation can be seen in relation to menstrual cycle. The sudden onset and without treatment drop in the gingival inflammation in otherwise healthy young girls was the stimulator of the hypothesis that there might be some relation between gingival inflammation and menstrual cycle stages.

It was hypothesized that gingival inflammation has a link with the ovulation period, when estrogen levels are high.

We studied the influence of estrogen concentration during ovulation at gingival health.

METHODOLOGY

It was a cross sectional study and involved two hundred girls with good oral hygiene belonging to age group of 20-22 years and their oral health was examined at various stages of menstrual cycle, especially during ovulation by two dentists and one medical doctor. Body weight, height, BMI and blood pressure were determined in all study subjects. Blood samples were drawn thrice specially at the time of ovulation which was estimated by history. Samples were investigated for serum concentrations of estrogen by using standard ELISA technique. Estradiol (micro grams / day) levels in Early Follicular phase among 200 young girls was estimated as (34.66 ± 5.07) and in Preovulatory phase it was calculated as (377 ± 3.40) whereas in Mid Luteal phase it was found to be (246± 4.77). These values show that the Estradiol (micro grams / day) levels were highest during Preovulatory phase. It was concluded that at time of ovulation the estrogen concentration in serum was significantly higher and at the same time gingivitis and periodontitis were diagnosed in acute form in most of the girls using standard diagnostic tools and techniques.

Key Words: Estrogen, ovulation, relationship to gingivitis.

ABSTRACT

The current study was carried out in order to estimate the effects of estrogen levels on gingival health. It was a cross sectional study and it was conducted at de, Montmorency College of Dentistry over a period of one month. A total of two hundred young females with good oral hygiene, in age range of 20-22 years formed the study group. Blood samples were drawn thrice specially at the time of ovulation which was estimated by history. Samples were investigated for serum concentrations of estrogen by using standard ELISA technique. Estradiol (micro grams / day) levels in Early Follicular phase among 200 young girls was estimated as (34.66 ± 5.07) and in Preovulatory phase it was calculated as (377 ± 3.40) whereas in Mid Luteal phase it was found to be (246± 4.77). These values show that the Estradiol (micro grams / day) levels were highest during Preovulatory phase. It was concluded that at time of ovulation the estrogen concentration in serum was significantly higher and at the same time gingivitis and periodontitis were diagnosed in acute form in most of the girls using standard diagnostic tools and techniques.

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Acknowledgments

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REFERENCES

any other acute and chronic illness were excluded from
the study and also those who had received periodontal
treatment in the last six months before the beginning
of this study were not included in the study.

RESULTS

The results of this study showed that the serum
congestion of estrogen was statistically significantly
higher on 14th day, that is Preovulatory phase and there
was gingival inflammation ranging from gingivitis to
moderate periodontitis depending upon the host defense
and hormone concentration varying from person to
person.

Estradiol (micro grams/ day) levels in Early Follicular phase among 200 young girls was estimated as
(34.66 ± 5.07) and in preovulatory phase it was calculated as (377 ± 3.40) where as in Mid luteal phase it
was found to be (246± 4.77). These values show that the Estradiol (micro grams / day) levels were highest
during preovulatory phase (Table 1).

Now comparing (Table 1) with gingival state of
these girls (Table 2) it is quite obvious that girls in
Preovulatory phase exhibited maximum bleeding gums
and 30% girls were observed with severe bleeding from
gums along with maximum pocket depth. The plaque
level which is considered as the major cause of the
disease of gingiva was constant and very low in girls
examined in this study during all the three stages of
menstruation cycle. It was observed that the inflamma-
tion vary with the hormonal level of girls cycle and
maximum severity of gingival disease was observed
during preovulatory phase which clearly confirms the
hypothesis that gingival disease vary with the level of
female hormones during ovulation.

DISCUSSION

Estrogen is a female sex hormone secreted in high
concentration at time of ovulation. In middle cycle there
is a noticeable change of events such as elevated blood
concentration of estrogen. About 24-48 hours after the
peak of estrogen elevated level a surge of the gonado-
trophins especially of luteinizing hormone (LH) crop up
which guide to the rip of follicle and discharge of its egg
in almost arround 9-12 hours. LH surge is started by a
remarkable rise of estradiol produced by the preovula-

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Early Follicular phase</th>
<th>Preovulatory phase</th>
<th>Mid luteal phase</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estradiol (microgram / day)</td>
<td>Mean ± standard deviation (n=200)</td>
<td>Mean ± standard deviation (n=200)</td>
<td>Mean ± standard deviation (n=200)</td>
<td>0.001*</td>
</tr>
<tr>
<td>(n-200)</td>
<td>(34.66+5.07)</td>
<td>(377+3.40)</td>
<td>(246+4.77)</td>
<td></td>
</tr>
</tbody>
</table>

* = Highly Significant (p-value < 0.05)

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<table>
<thead>
<tr>
<th>Dental diagnostic parameters</th>
<th>girls in early follicular phase mean ± SD (n=200)</th>
<th>Girls in preovulatory phase mean ± SD (n=200)</th>
<th>Girls in mid luteal phase mean ± SD (n=200)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bleeding from gums</td>
<td>10% bleeding in patients 1%=Severe Bleeding 5%=Moderate Bleeding 4%=mild Bleeding</td>
<td>100% bleeding in patients 30%=Severe Bleeding 50%=Moderate Bleeding 20%=mild Bleeding</td>
<td>20% bleeding in patients 5%=Severe Bleeding 10%=Moderate Bleeding 5%=mild Bleeding</td>
</tr>
<tr>
<td>Plaque index</td>
<td>0.5 ± 0.40</td>
<td>0.5 ± 0.40</td>
<td>0.5 ± 0.40</td>
</tr>
<tr>
<td>Community Periodontal Index of Treatment Needs (CPTIN)</td>
<td>1.5 ± 0.13</td>
<td>2.50 ± 0.26</td>
<td>1.6 ± 0.20</td>
</tr>
<tr>
<td>Mean pocket depth (mm)</td>
<td>0.45 ± 0.33</td>
<td>2.96 ± 0.59</td>
<td>0.95 ± 0.11</td>
</tr>
</tbody>
</table>
Relationship of gingival disease with ovulation among young girls

The study of estrous follicle and it is the relatively accurate forecaster for timing the ovulation. The estrogens in women are estrone (E1), estradiol (E2), and estriol (E3). Estrone is secreted in women with menopause, estradiol is the main hormone founded in nonpregnant females, and estriol is most important hormone seen in the span of pregnancy. 2,11

Not much literature is available on this topic. In 2004 a research was published by Cenk Haytaç in Journal of Periodontology, showing “The Effects of Ovulation Induction During Infertility Treatment on Gingival Inflammation” The results of his study throw light on the effects of hormone that are secreted after ovulation induction, which is considered as the usual treatment method in the management of infertility. The drug causes gingival inflammation, bleeding from gums and other signs of gingival disease and it also shows that the usage of these drugs is powerfully connected with the harshness of gingival inflammation. 9

Study done by Machtei revealed a positive link between the periodontal health and gum disease. 8 One more research was found suggesting that hormones have a negligible effect on clinically healthy periodontium. 12

In this study a clear relation of inflammation was observed with variation of hormonal level of girl’s menstrual cycle. It was also observed that the severity of gingival disease during preovulatory phase reaches at its peak which clearly confirms the hypothesis that gingival disease vary with the level of female hormone during ovulation.

CONCLUSION

Under the influence of estrogen in otherwise healthy young girls, the probability of developing gingivitis and periodontitis was noticeably great. The result of this research confirms that estrogen has significant effect on the gingival health of the girls. During different stages and levels of this hormone in female menstrual cycle the gingival disease acuteness varies showing a positive correlation of gingival disease with hormone level. This research also specifies the necessity of future researches to confirm the relation of hormone vacillation and gum disease.

REFERENCES