Menopause marks permanent cessation of menstruation with repercussions on various organs, amongst which is the oral cavity. Menopause is an unspoken, unattended reality of life. Earlier centuries considering menopause to be the end of a woman's usefulness to mankind to the current concept of it being a critical transition in women's lives because of the co-occurring biological, social and psychological changes has led to a change in the outlook.

Menopause is an unspoken, unattended reality of life. Modern medicine has led to females now leaving one third of their lives in menopause. World health organization (WHO) has defined post-menopausal women as those women who have stopped menstrual bleeding one year ago or stopped having periods as a result of medical or surgical intervention or both.

Modern medicine has led to females now leaving one third of their lives in menopause. The two main hormones, estrogen and progesterone contribute to physiological changes at various phases, right from menstruation to menopause. Estrogen influences the cytodifferentiation of stratified squamous epithelium and aid in collagen synthesis and maintenance. Progesterone has shown direct cytodifferentiation of stratified squamous epithelium and aid in right from menstruation to menopause. Estrogen influences the oral menopausal symptoms dominated moderate risk group whereas general menopausal symptoms were prevalent in high risk group of periodontitis. Menopausal gingivostomatitis, which is characterised by gingivae that are dry and shiny, bleeds easily and range in colour from abnormally pale to erythematous is also frequently noted.

Menopause has also been associated with destructive periodontal disease in older women putting females at a risk for developing periodontal disease. Assessment and use of risk level in prevention and management of periodontitis is a complex and difficult task.

In 2008, AAP defined risk assessment as “the process by which qualitative or quantitative assessments are made of the likelihood for adverse events to occur as a result of exposure to specified health hazards or by absence of beneficial influences.” Various risk assessment tools are available like Periodontal Risk Assessment, Periodontal Risk calculator (PRC), OHI-Suite etc. Periodontal Risk Assessment (PRA) model is based on a multifactorial graphic, ie, the Periodontal Pentagon Risk Diagram. This functional diagram is composed of 6 vectors representing a combination of 6 clinical, systemic, and environmental factors to predict the risk of recurrence of periodontitis and patients are classified as high, moderate or low risk profile. The following parameters are assessed (1) percent bleeding on probing, (2) number of residual periodontal pockets > 5 mm, (3) number of lost teeth, (4) percent alveolar bone loss in relation to the patient's age, (5) systemic and/or environmental factors, (6) environmental/behavioral factor.

Menopausal symptoms present themselves to some as being tolerable and to others as being unbearable. These symptoms are often underreported owing to sociocultural factors. Endocrinological disturbances, due to reduced estrogen, calcium and vitamin deficiency and various psychologic factors have led to increase in the occurrence of oral symptoms in their menopausal years. Dry mouth due to reduced salivary secretion, burning sensation of the mouth and tongue, metallic taste sensation are common symptoms. Dysesthesia, dental caries, periodontitis and an osteoporotic jawbone are other symptoms.

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providing an assessment of risk for patients during the supportive, posttreatment phase and after active therapy outweighs Periodontal Risk Calculator (PRC), which is calculated at the onset of treatment thus increasing the generalizability and external validity of the tool and therefore the potential applicability to clinical practice. This led us to include PRA in the current study design. So the current study was conducted to know the prevalence of post-menopausal symptoms in Bagalkot district and also estimate the amount of risk with symptom prevalence, which will help in educating and motivating menopausal women towards their oral health.

Unfortunately, there is scanty of available data in assessing link between menopause and periodontal risk awareness in this area. Therefore, the current study assessed knowledge of menopausal females regarding menopausal effects on oral and systemic health and its relationship with periodontal risk assessment.

MATERIALS AND METHODS
Keeping the margin of error at 5% and confidence level 95%, and setting the power of study at 80% the sample size of 600 was considered to be appropriate for the present study. A community based prospective cross-sectional survey was conducted among 600 menopausal females in the Bagalkot district of Karnataka. Depending on history from the participant, post-menopausal females (menopause for >1 year) were included in the study. Females with unnatural menopause (surgical or radiotherapy for cervical cancer), on medications such as anxioylitics, anti-depressants, those having serious disease or mental retardation were excluded from the study to avoid treatment related effects.

After obtaining informed consent from all participants, the questionnaire was individually distributed and answers were collected in the presence of the investigator. The survey comprised of 2 parts, the questionnaire and periodontal risk assessment. The questionnaire was further divided into two parts wherein the general and oral symptoms of patients after entering menopause were assessed. There were 14 close ended questions and 2 open ended questions. Intraoral examination was carried out of each of the participant by a single examiner and patients were divided into low, medium and high risk candidates for periodontal disease.

RESULTS AND STATISTICS
The data collected were tabulated and statistically analyzed using computer software, IBM Statistical Package for Social Sciences (SPSS) Version 20. Analysis was done using, unpaired t test and chi square test. All the data were expressed as mean ± standard deviation. All P<0.001 were considered to be statistically significant.

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>YES (%)</th>
<th>NO (%)</th>
<th>CHI SQUARE VALUE</th>
<th>P VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOOD SWINGS</td>
<td>38.7</td>
<td>61.3</td>
<td>5.785</td>
<td>0.016*</td>
</tr>
<tr>
<td>IRRITABILITY</td>
<td>6.3</td>
<td>93.7</td>
<td>3.419</td>
<td>0.064</td>
</tr>
<tr>
<td>VISIT TO GYNAECOLOGIST</td>
<td>4.9</td>
<td>95.1</td>
<td>0.048</td>
<td>&lt;0.001**</td>
</tr>
<tr>
<td>USE OF CALCIUM SUPPLEMENTS</td>
<td>5.1</td>
<td>94.9</td>
<td>1.443</td>
<td>0.23</td>
</tr>
<tr>
<td>NOTICING ORAL HEALTH CHANGES</td>
<td>7.5</td>
<td>92.9</td>
<td>1.879</td>
<td>0.179</td>
</tr>
<tr>
<td>NOTICING GUM DISEASE</td>
<td>9.9</td>
<td>90.1</td>
<td>0.304</td>
<td>0.581</td>
</tr>
<tr>
<td>BLEEDING GUMS</td>
<td>39.1</td>
<td>60.9</td>
<td>15.77</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>BRUSHING AFTER MEAL</td>
<td>4.1</td>
<td>96</td>
<td>0.114</td>
<td>0.735</td>
</tr>
<tr>
<td>BURNING MOUTH</td>
<td>8.3</td>
<td>91.7</td>
<td>6.613</td>
<td>0.010</td>
</tr>
<tr>
<td>DRYNESS OF MOUTH</td>
<td>8.7</td>
<td>91.3</td>
<td>0.1</td>
<td>0.752</td>
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<tr>
<td>MOBILITY</td>
<td>2</td>
<td>98</td>
<td>0.662</td>
<td>0.416</td>
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<tr>
<td>TOOTH LOSS</td>
<td>4.4</td>
<td>95.6</td>
<td>0.256</td>
<td>0.613</td>
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<tr>
<td>BAD TASTE</td>
<td>7.5</td>
<td>92.5</td>
<td>8.784</td>
<td>0.003</td>
</tr>
<tr>
<td>BAD SMELL</td>
<td>6.7</td>
<td>93.3</td>
<td>2.861</td>
<td>0.091</td>
</tr>
</tbody>
</table>

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** - SIGNIFICANT
*** - HIGHLY SIGNIFICANT
The psychological state of the female comprises an important aspect of menopause. Psychological disturbance in the menopause is not solely due to hormonal changes but stress, ageing and sociocultural factors also play an important role. Estrogen activity in the limbic system, together with its effects on neurotransmitter activity in the CNS improves psychological functioning. So in the present study menopausal Mood swings were more prevalent in low risk group while irritability and use of calcium supplements were found to be more prevalent in high risk group. Visit to gynaecologist was most in moderate risk group. (Table 4,5,6)

In supra-physiologic doses estrogen leads to a decrease in proestaglandin synthesis in gingival tissue. Reduced estrogen levels are linked to gingival inflammation and reduced clinical attachment levels. In menopause, estrogen levels decline rapidly, which can lead to systemic bone loss. Bone turnover rate being higher in alveolar bone than long bones, it can be concluded that a systemic imbalance in bone resorption and deposition might be manifested earlier in the alveolar process than in other sites. This correlates with mobility and tooth loss seen more in moderate risk group. (Table 4,5,6)

Bleeding gums was most prevalent in moderate risk group. This can be due to the reduction in the estrogenic levels in the blood during menopause making epithelium thinner and atrophic and thus more susceptible to inflammatory processes. It also leads to increase in the volume of endothelial cells, adherence of granulocytes and plaques to the vessel walls, formation of microthrombi, destruction of macrophages and an increase in vascular proliferation. Scardina and Messina compared oral microcirculation in postmenopausal women using video capilloscopy with controls. Their study showed significant differences between cases and controls for the vascular parameters such as the diameter of loops, tortuosity of vessels in labial mucosa and density of periodontal mucosa. All these factors predisposed to inflammation.

Halitosis was more in moderate risk group (Table 4, 5, 6). This can be due to exaggeration of systemic factors as well as enhancement of local factors that can increase severity of disease and thus cause halitosis. Hence in the present study it can be concluded that though the prevalence of oral and general symptoms is high in menopausal subjects, the female population is still not aware about it and are not keen on regular dental visits.

To conclude generation of awareness drive is essential right from an early age. Dental health checkups and awareness camps have to be conducted from school age when one attains puberty right through pregnancy and then menopause. Creation of awareness only at menopausal stage will not suffice. The damage to periodontium has to be caught at an early stage and hence the seeds of prevention need to be planted in the schooling years. Periodontal health education will have to be implemented from urban to rural health setups which will help in enhancing periodontal and general health. Periodontists need to be eagle-eyed when examining their female menopausal patients and if needed refer them to appropriate medical specialist for help in relieving of their symptoms. An understanding of the general and oral problems faced during menopause will help the female population make necessary changes in their daily routine to be able to lead a relatively healthy life.

REFERENCES

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