From Basic Science to Clinical Practice
Welcome Message
The 70th Anniversary
Dean
Faculty of Dentistry, Chulalongkorn University

On behalf of the Faculty of Dentistry, Chulalongkorn University, I welcome you to the 70th Anniversary Celebration 2010.

On the auspicious occasion, the Local Organizing Committee has strived to make this event a memorable one scientifically and socially by a three-day celebration of scientific lectures in the theme “From Basic Science to Clinical Practice”. The objective is to help promoting the oral health of global nations in terms of education in dental area and also from basic science to clinical practice. With participants from all over the world and almost 20 deans join us in celebrating the occasion, we do hope that this will enable the participants to share and gain their knowledge as well as strengthen our friendships and future collaboration.

My greatful thanks to each and everyone concerned for their valuable input and contributions to the success of this event. Special thanks need to be extended to our friends who came from far away to commemorate with us this special occasion. We hope you will take this opportunity to enjoy the various unique sights and tastes that Thailand has to offer.

Lastly, this conference will not be possible without the great contribution from our Local Organizing Committee.

Wishing all a pleasant stay in Bangkok.
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The level of estrogen in postmenopausal women with TMD diagnosed by TMD-Diagnostic Index

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Introduction: The highest prevalence for TMD among women is in the reproductive years. Many literatures stated that estrogen may play a role in the development of the TMD. Generally, the level of estrogen is decreased in postmenopausal women, subsequently, the prevalence of TMD is also decreased. But some studies showed just the opposite. In Indonesia, to do early assessment of TMD patients, Himawan et al. (2006) developed a TMD diagnostic index (TMD-DI) that can be used by dentists and other health professionals. Using Helkimo index as a gold standard, the cutoff point 3 was selected to differentiate between those with and without TMD. Objective: The objective of this study was to compare the level of estrogen in postmenopausal women with TMD diagnosed by TMD-Diagnostic Index. Methods: 95 postmenopausal women who did not receive hormone replacement therapy were asked to fill the TMD-DI questionnaires, which consist of 8 items, then the level of estrogen was analyzed by blood serum. Results: Independent T-test analysis showed that estrogen level in postmenopausal women with TMD signs and symptoms were significantly different than those without ($p=0.05$). Conclusion: The levels of estrogen in postmenopausal women with TMD signs and symptoms are higher than those without. Estrogen could be a risk factor to TMD.

Keywords: estrogen, TMD, TMD-DI
Certificate of Attendance

This is to certify that Dr. Ira Tanti has participated as a POSTER PRESENTER in The 70th Anniversary Celebration 2010 "From Basic Science to Clinical Practice" August 12-14, 2010

Faculty of Dentistry, Chulalongkorn University, Bangkok, Thailand

[Signature]

Associate Professor Wacharapon Tasachan
Dean of the Faculty of Dentistry, Chulalongkorn University
THE LEVEL OF ESTROGEN IN POSTMENOPAUSAL WOMEN
WITH TMD DIAGNOSED BY TMD-DIAGNOSTIC INDEX

Ira Tanti, Laura Susanti Himawan, Lindawati S. Kusdhany

MANUSCRIPT

Prosthodontic Department, Faculty of Dentistry
Universitas Indonesia
The Level of Estrogen in Postmenopausal Women With TMD Diagnosed by TMD-Diagnostic Index.

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Abstract

The highest prevalence for TMD among women is in the reproductive years. Many literatures stated that estrogen may play a role in the development of the TMD. Generally, the level of estrogen decreases in postmenopausal women, subsequently also decreasing the prevalence of TMD. But some studies showed just the opposite. In Indonesia, to do early assessment of TMD patients, Himawan et al (2006) developed a TMD diagnostic index (TMD-DI) that can be used by dentists and other health professionals. Using Helkimo index as the gold standard, the cut off point 3 was selected to differentiate between those with and without TMD (2008). Objectives: To compare the level of estrogen in postmenopausal women with TMD diagnosed by TMD-Diagnostic Index.

Material and Methods: 95 postmenopausal women who did not receive hormone replacement therapy were asked to fill the TMD-DI questionnaires which consists of 8 items, then the level of estrogen was analyzed by blood serum.

Results: T test independent analysis showed that estrogen level in postmenopausal women with TMD signs and symptoms were significantly different than those without (p=0.05).

Conclusion: The level of estrogen in postmenopausal women with TMD signs and symptoms are higher than the ones without. Estrogen could be a risk factor for TMD.

Key words: TMD, TMD-DI, Estrogen

Introduction

Temporomandibular disorders (TMD) is a collective term that embraces a number of clinical conditions that involve the masticatory musculature or temporomandibular joints (TMJ) and associated structures. TMD affect women with greater frequency than men, and sex hormones may contribute to this female predominance. The highest prevalence for TMD among women is in the reproductive years. Many literatures stated that estrogen may play a role in the development of the TMD. Generally, the level of estrogen decreases in postmenopausal women, subsequently also decreasing the prevalence of TMD. But some studies showed just the opposite. The mechanism of action of estrogens effects is still unknown and is a matter of debate.

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Sex hormones are known to influence the differentiation, growth and development, and metabolism of connective tissues. \(^3\) Hormones, particularly estrogen, could act through their receptors directly on the TMJ and associated soft tissues. Peripherally, estrogens are known to increase joint laxity. They also enhance a number of specific inflammatory responses in the TMJ. Estrogen receptors have been found in the TMJ tissues of female primates, but not in male primates. Centrally, estrogens act to influence pain neurotransmission.\(^1\)

Functional derangements of TMJ may result from loss of synovial fluid viscosity, which leads to increased congruity of the articulating surfaces, desynchronization of the upper and lower heads of the lateral pterygoid muscles, which may result from occlusal interferences, and/or laxity in the various ligamentous attachments of the condyle and disks to each other and to the temporal bone.\(^6\)

TMD is generally determined by the presence of one or more symptoms. The etiology of TMDs is complex and multifactorial. Some researchers have tried to formulate indices to diagnose TMD like Helkimo index, Craniomandibular index, RDC/TMD index. In Indonesia, to do early assessment of TMD patients, Himawan LS, et al (2006) developed a TMD diagnostic index (TMD-DI) that can be used by dentists and other health professionals.\(^7\) Using Helkimo index as the gold standard, the cut off point 3 was selected to differentiate between those with and without TMD (2008).\(^8\)

The aim of this study was to determine the incidence of TMD in postmenopausal women using TMD-DI. The level of estrogen was compared in postmenopausal women with and without TMD, to determine whether estrogen is a risk factor in TMD or not.

**Material and Methods**

This study was carried out in the city of Bekasi, West Java, Indonesia. 95 postmenopausal women age 45 to 75, Deutero Melayu race, physical condition healthy without sistemic diseases like Diabetes Mellitus, did not receive hormone replacement therapy, were asked to fill the

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TMD-DI questionnaires which consists of 8 items, then the level of estrogen was analyzed from blood serum. All subjects gave informed consent to procedures approved by the proper Ethics Committee.

TMD-DI questionnaires consist of 8 items which have 4 criteria and scores (never/0, seldom/1, often/2 and always/3). (table1). The total scores are 24 and based on the earlier study we used the cut off point 3 was selected to differentiate between those with and without TMD.

Table 1: TMD-DI

<table>
<thead>
<tr>
<th>Items</th>
<th>Criteria / Scores</th>
</tr>
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<tbody>
<tr>
<td>Do you have symptoms such as:</td>
<td></td>
</tr>
<tr>
<td>1. Pain around your jaw</td>
<td>Never (0)</td>
</tr>
<tr>
<td>2. Headache</td>
<td>Seldom (1)</td>
</tr>
<tr>
<td>3. Pain in opening and closing the mouth</td>
<td>Often (2)</td>
</tr>
<tr>
<td>4. Pain around neck</td>
<td>Always (3)</td>
</tr>
<tr>
<td>5. Tingling ears</td>
<td></td>
</tr>
<tr>
<td>Do you do clenching when you are:</td>
<td></td>
</tr>
<tr>
<td>6. Confused</td>
<td></td>
</tr>
<tr>
<td>7. Angry</td>
<td></td>
</tr>
<tr>
<td>8. Fully concentrated</td>
<td></td>
</tr>
</tbody>
</table>

Source:

The level of estrogen was analyzed from blood serum using Microparticle Enzyme Immunoassay (MEIA) method. The result was then compared between those with and without TMD.

Univariate statistical analysis was used to differentiate postmenopausal women with and without TMD, and was also used to determine the estrogen level. Bivariate statistical analysis was used to show the effect of estrogen in postmenopausal women with or without TMD.

Results and discussion

95 subjects were given informed consent and TMD-DI questionnaires. 5 subjects did not fulfill the criteria because they were not postmenopausal women. The results of TMD-DI score were

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determined. 46 postmenopausal women have TMD-DI score 0-2 and 44 postmenopausal women have TMD-DI score 3-10 which can be categorized in TMD subjects. The frequent symptoms are headache, pain around neck, tingling ears and also behavioral factor that cause clenching during angry.

TMD-DI was developed by Himawan LS, et al (2006) in order to get a simple and reliable index for epidemiological study and to do quick and early assessment for the TMD. Indrawati, et al (2008) studied the accuracy and selected the cut off point of TMD-DI using Helkimo index as a gold standard to differentiate between those with and without TMD. TMD-DI was found to be a sensitive index for screening TMD and the cut off point 3 was selected.

Table 2 describes the level of estrogen in postmenopausal women. Estrogen in TMD subjects are higher than non-TMD subjects. Generally, the level of estrogen in postmenopausal women is lower than reproductive women.

<table>
<thead>
<tr>
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<th>TMD</th>
<th>N</th>
<th>MEAN</th>
<th>STAND DEV</th>
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<tbody>
<tr>
<td>ESTROGEN</td>
<td>-</td>
<td>46</td>
<td>16.0870</td>
<td>8.40853</td>
</tr>
<tr>
<td></td>
<td>+</td>
<td>44</td>
<td>19.3864</td>
<td>7.49020</td>
</tr>
</tbody>
</table>

Postmenopausal women with TMD-DI score 3-10 have higher serum levels of estrogen than subjects with TMD-DI score 0-2. Epidemiological data (Carlsson & LeResche) suggest that sexual hormones may be important in TMD pathogenesis. TMD prevalence is higher in females than in males (3:1) and lower in postmenopausal women than in reproductive women.

T-test independent analysis showed that estrogen in postmenopausal women with sign and symptom of TMD were significantly higher than without (p=0.05). Landi, et al suggest that populations affected by TMD have higher serum levels of estrogen than healthy subjects. Study in animal models showed a possible relationship between

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hormonal levels and pathological changes affecting the TMJ (Yasuoka, et al). Immunohistochemical studies have shown the presence of estrogen receptors in the human articular disc, and higher concentrations of estrogen receptors in disk samples of women with signs and symptoms of TMD.\textsuperscript{9}

The contradictory results of research on hormones and TMD has been proposed by Campbell (1993). His study suggests that TMD may not be hormonally modulated by estrogens when the study of 14 human subjects revealed no significant presence of estrogen receptors in the tissue.\textsuperscript{1}

In this study, subjects did not receive hormone replacement therapy to control bias between endogenous reproductive hormones and exogenous hormones. There is a contradictory result between TMD and exogenous hormones. Abubaker, et al found that women with TMD reported higher use of exogenous hormones than controls, while Haskin, et al proposed that there may be an inverse relationship between circulating estrogen levels and joint pain.\textsuperscript{1} Yu S, et al hypothesize that estrogens synthesized locally in condylar cartilage have a profound effect on the development of TMD. Regulating the amount and effect of locally synthesized estrogen seems to hold interesting future prospects for the treatment of TMD.\textsuperscript{10}

Although this study has limitation, it seems to indicate that high serum estrogen levels may be implicated in developing of TMD. Future investigation of local estrogen in TMJ may give, at least partially, valuable evidences for the etiology and treatment strategy of TMD.

Conclusions

Estrogen in postmenopausal women with TMD signs and symptoms are higher than the ones without. Estrogen could be a risk factor for TMD.

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References


