Prevalence of Temporomandibular Disorders in Pregnancy

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ABSTRACT

Aim: *To determine if the prevalence of systemic joint hypermobility and temporomandibular disorders (TMD) is higher during pregnancy or not and also to confirm a correlation between systemic joint hypermobility and TMD.*

Methods: *70 pregnant and 40 age-matched non pregnant women were enrolled in the study. 30% of the pregnant women were in the first trimester of gestation, 34.3% of them were in the second, and 35.7% of them were in the third trimester. All of the subjects completed a self-administered questionnaire, and underwent a standardized clinical examination using the Research Diagnostic Criteria for TMD (RDC/TMD). Hypermobility was determined according to the criteria of Beighton et al.*

Results: *7.1% of the pregnant women and 7.5% of the non-pregnant women received an RDC/TMD Axis I diagnosis (p> 0.05). 31.4% of the pregnant women and 40% of the non-pregnant women had systemic joint hypermobility (p> 0.05). Among all subjects who received a RDC/TMD Axis I diagnosis, 35.3% had systemic joint hypermobility and among all subjects who did not meet criteria to receive a RDC/TMD Axis I diagnosis, 25% had systemic joint hypermobility (p> 0.05).*

Conclusion: *The prevalence of TMD and systemic joint hypermobility were not high among pregnant women compared to age matched non-pregnant women. And we were not able to confirm a correlation between systemic joint hypermobility and TMD.*

Key words: *Temporomandibular disorders; prevalence; pregnancy; pain; hypermobility.*

INTRODUCTION

Temporomandibular disorder (TMD) is a collective term that embraces a number of clinical conditions that involve the masticatory musculature or temporomandibular joints (TMJ) and associated structures. These clinical conditions are characterized by pain in the preauricular area, TMJ, or muscles of mastication, limitation or deviation in the mandibular range of motion, and TMJ sounds (clicking, popping, and crepitus) during mandibular function (1).

The higher prevalence of temporomandibular disorder pain among women has been extensively hypothesized and documented in numerous epidemiological studies (2). Several theories involving both biological and psychological factors have been proposed to explain this gender difference (3). It was suggested that post-menopausal women, those receiving hormone replacement therapy (HRT) were found to be at higher risk for TMD than those not receiving HRT (4).

Pregnancy produces dramatic changes in levels of estrogens and progesterone. Both estrogen and progesterone levels rise throughout pregnancy. Estrogens are known to increase joint laxity (5), at least during pregnancy, and laxity of the temporomandibular joint is thought to play a role in the development of some of these disorders (6). Another possibility is that estrogens enhance a number of specific inflammatory responses in the temporomandibular joint (7).

Another possible hormonal factor may be relaxin. Relaxin levels increase 2- to 3-fold during pregnancy (8). Increased systemic joint laxity in pregnant women has been linked to elevated levels of relaxin (9).

As the levels of relaxin and estrogen increases throughout pregnancy, laxity of the temporomandibular joint may increase and there may be a tendency to TMD. We aimed to determine if the prevalence of TMD and systemic joint hypermobility is higher during pregnancy or not. And we purposed to confirm a correlation between systemic joint hypermobility and TMD.

MATERIAL and METHODS

70 pregnant (mean ages 26.9±5.2) and 40 (mean ages 28.15±7.1) non pregnant women were enrolled in the study. A known psychiatric disease, a trauma to temporomandibular joint or face, Rheumatoid arthritis and seronegative sondyloarthropathy were excluded from the study. 30% (n= 21) of the pregnant women were in the first trimester of gestation, 34.3% (n= 24) of them were in the second, and 35.7% (n= 25) of them were in the third trimester.

The study protocol was approved by our Institutional Research Ethics Committee. All of the subjects gave written informed consent, completed a self-administered questionnaire, and underwent a standardized clinical examination using the Research Diagnostic Criteria for Temporomandibular Disorders (RDC/TMD) (1). The patients diagnosis are grouped as follows:

Group I

Group Ia: Myofascial pain

Group Ib: Myofascial pain with limited opening

No Group I diagnosis

Group II-Left joint

Group IIa: Left disc displacement (DD) with reduction

Group IIb: Left DD without reduction with limited opening

Group IIc: Left DD without reduction without limited opening.

No Left Group II diagnosis

Group II- Right joint

Group IIa: Right DD with reduction

Group IIb: Right DD without reduction with limited opening

Group IIc: Right DD without reduction without limited opening.

No Right Group II diagnosis

Group III- Left joint

Group IIIa. Left arthralgia

Group IIIb: Left osteoarthritis

Group IIIc: Left osteoarthrosis

No Left Group III diagnosis

Group III- Right joint

Group IIIa: Right arthralgia

Group IIIb: Right osteoarthritis

Group IIIc: Right osteoarthrosis

No Right Group III diagnosis

Pain severity was assessed using the Graded Chronic Pain Scale (GCPS) (10). The GCPS, was developed to provide a brief and simple method of grading the severity of chronic or recurrent pain. It has good validity and reliability, as assessed in samples of patients with headache and with TMD pain. All subjects were asked to rate their average, worst and current pain intensity on 0 to 10 scales; the mean of these three ratings is the characteristic pain intensity score. They were also asked to rate on 0 to 10 scales the degree to which the pain interferes with daily activities, work/housework activities and recreational/ social activities. The mean of these three ratings is the pain-related disability score. In addition, GCPS was used to classify the subjects into one of five categories:

0= no pain;

I= low pain intensity and low pain-related disability;

II= high pain intensity and low pain-related disability;

III= moderate pain-related disability;

IV= severe pain-related disability.

The RDC/TMD Axis II was used to measure depression and somatization (1). Non-specific physical symptoms (NPS) with pain items included and excluded are assessed in somatization scale. Depression and somatization scales are validated as a screening tool (not diagnostic); normed for RDC/TMD using population-based data and patients are classified as normal, moderate or severe symptom level (11). The clinical utility of the RDC/TMD Axis II was demonstrated (11).

Clinical TMD findings were assessed using the standardized RDC/TMD clinical examination and Axis I diagnosis were generated according to RDC/TMD criteria. An extra oral muscle palpation pain severity score was calculated by summing the subject's ratings of pain on palpation of 16 muscle sites (bilateral palpation of the posterior, middle, and anterior temporalis; superior, middle and inferior masseter; posterior mandibular region; and submandibular region). Ratings for each site can range from 0 (no pain) to 3 (severe pain), so the severity score can range from 0 to 48. Measures of pain-free unassisted mandibular opening and maximum assisted mandibular opening (in millimeters) were also collected.

Hypermobility was determined according to the criteria of Beighton et al (12). Patients were given a score of 0–9, one point being allocated for the ability to perform each of the tests: (a) passive dorsiflexion of the little finger beyond 90º; (b) passive apposition of the thumb to the flexor aspects of the forearm; (c) hyperextension of the elbow beyond 10º; (d) hyperextension of the knee beyond 10º; and (e) forward flexion of the trunk, with the knees straight, so the palms of the hands rested easily on the floor. Patients were considered hypermobile if they scored 4 or more out of 9.

Statistical Analysis

Differences between the pregnant and non-pregnant groups were assessed using t- tests for continuous variables and X2 tests for dichotomous variables.

RESULTS

There was not statistically difference between pregnant and non-pregnant women according to age ($p< 0.05$) 7.1% (n= 5) of the pregnant women and 7.5% (n= 3) of the non pregnant women received an RDC/TMD Axis I diagnosis ($p> 0.05$). These RDC/TMD diagnoses were distributed as follows (Table 1). Among pregnant women, one in the first trimester had right osteoarthrosis (Group IIIc), one in the second trimester had right and left arthralgia (Group IIIa), one in the second trimester had right arthralgia (Group IIIa), one in the second trimester had myofascial pain with limited opening (Group Ib) and the last one in the third trimester had right disc displacement (RDD) with reduction (Group IIa). Among control group, two had myofascial pain with limited opening (Group Ib) and one had RDD with reduction (Group IIa).

31.4% (n= 22) of the pregnant women and 40% (n= 16) of the non-pregnant women had systemic joint hypermobility ($p> 0.05$).

***Table 1**. Distribution of RDC/TMD diagnosis among pregnant and non pregnant women.*

	Pregnant (n=5)	***Non-pregnant (n=3)***
Osteoarthrosis	*1*	-
Artralgia		
Right	*1*	-
Bilaterally	*1*	-
Myofascial pain	*1*	*2*
**RDD with reduction*	*1*	*1*

** RDD: Right disc displacement.*

Among all subjects who received a RDC/TMD Axis I diagnosis, 35.3% had systemic joint hypermobility and among all subjects who did not meet criteria to receive a RDC/TMD Axis I diagnosis, 25% had systemic joint hypermobility (p> 0.05).

85.7% of pregnant women had a Graded Chronic Pain score of 0, and 8.6% had grade 1 pain, 5.7% had grade 2 pain. 45% of non-pregnant women had grade 0 pain, 37.5% had grade 1 pain and 17.5% had grade 2 pain. Non-pregnant women had more pain and this was statistically significant (p< 0.05).

Levels of depression, NPS pain items included and NPS pain items excluded were not different between pregnant and non-pregnant women (Table 2).

Among all subjects who received a RDC/TMD Axis I diagnosis (n= 8), 50% had severe depressive symptoms and among all subjects who did not meet criteria to receive a RDC/TMD Axis I diagnosis (n= 102), 29.4% had severe depressive symptoms (p= 0.427).

NPS pain items included and NPS pain items excluded were also not different between the subjects who received a RDC/TMD Axis I diagnosis and who did not (p> 0.05).

DISCUSSION

We found the prevalence of TMD and systemic joint hypermobility not different between the pregnant and non-pregnant women. Furthermore, we observed no correlation between the presence of systemic joint hypermobility and TMD.

Population-based studies show the prevalence of TMD to be approximately 2 to 5 times higher in women than in men in community samples (13). During pregnancy, the ligaments of the pubic symphysis and sacroiliac joints loosen, possibly because of the hormone relaxin (9) and estrogen (5). This increased joint laxity extends to peripheral joints (14) and temporomandibular joint (15).

A hypermobile TMJ may be more prone to dysfunction. Westling (6) has postulated that TMD are associated with joint laxity. There is a controversy in the literature over correlating relaxin and other hormonal changes during pregnancy with joint hypermobility. Some authors suggest that female reproductive hormones represent a risk factor for the development of TMD (16), whereas other authors find no correlation between relaxin and other female hormones and TMD (17). LeResche et al (15) found that the increased joint laxity in TMJ occurring over the course of pregnancy was accompanied by decreased rather than increased musculoskeletal orofacial pain levels in a prospective study. In the present study, we observed that non-pregnant women had higher levels of Graded Chronic Pain than pregnant women (p<0.05). Findings from studies of experimental pain suggest that the high levels of estrogen and progesterone characteristic of the pregnancy have antinociceptive properties (18).

In a cross-sectional study among Cape Coloured pregnant women, the incidence of systemic joint hypermobility was found surprisingly low (19). On

Table 2. Levels of depression, NPS pain items included and NPS pain items in pregnant and non-pregnant women.

	Non-pregnant n	(%)	Pregnant n	(%)	p value
Depression					
Normal	9	(22.5)	20	(28.6)	
Moderate	18	(45.0)	29	(41.4)	0.785
Severe	13	(32.5)	21	(30.0)	
NPS pain included					
Normal	12	(30.0)	13	(18.6)	
Moderate	13	(32.5)	22	(31.4)	0.309
Severe	15	(37.5)	35	(50.0)	
NPS pain excluded					
Normal	16	(40.0)	18	(25.7)	
Moderate	10	(25.0)	13	(18.6)	0.108
Severe	14	(35.0)	39	(55.7)	

contrary, Charlton et al (20) found that high serum estrodiol levels during the third trimester of pregnancy correlated with increased laxity of anterior cruciate ligament by measuring anterior tibial translation. And Silviera et al (21) observed a high incidence of systemic hypermobility which was not correlated with mandibular hypermobility and TMD in pregnancy. In the present study, the prevalence of systemic joint hypermobility was found to be not different between the pregnant and non-pregnant women. Furthermore, there was not any difference in the prevalence of RDC/TMD Axis I diagnosis between pregnant and non-pregnant women in the present study ($p>0.05$). And also no correlation was found between the presence of TMD and systemic joint hypermobility.

An association with increased psychological dimension changes, particularly depression scores, in TMD patients was reported (22). Interestingly, other studies found increases in depression scores that were not in the psycho-pathological range (23). In concordant with this finding, in the present study the levels of depressive symptoms, NPS pain items included and NPS pain items excluded were not different between the subjects who received a RDC/TMD Axis I diagnosis and who did not.

The limitation of our study was that our sample size was small.

To summarize, the prevalence of TMD and systemic joint hypermobility were not high among pregnant women compared to age matched non-pregnant women. And we were not able to confirm a correlation between systemic joint hypermobility and TMD. Further large sampled and prospective studies are needed to confirm these results.

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