



Association Between Gynecological Characteristics and Temporomandibular Disorders: Insights from the OPPERA Study

Erin Carey¹, Denniz Zolnoun¹, Gary Slade^{2,3}, Richard Ohrbach⁴, Flora Mulkey⁵, Naomi Brownstein⁵, Victoria Nneji⁵, Ron Dubner⁶
Joel Greenspan⁶, Roger Fillingim⁷, William Maixner^{2,8}, Eric Bair^{2,5,8}

Department of Obstetrics and Gynecology, UNC-Chapel Hill¹; Regional Center for Neurosensory Disorders, UNC-Chapel Hill²; Department of Epidemiology, UNC-Chapel Hill³; Department of Oral Diagnostic Sciences, Univ. of Buffalo⁴; Department of Biostatistics, UNC-Chapel Hill⁵; Department of Neural and Pain Sciences, Univ. of Maryland-Baltimore⁶; Department of Community Dentistry and Behavioral Science, Univ. of Florida⁷; Department of Endodontics, UNC-Chapel Hill⁸



Introduction

- Several chronic pain conditions, such as temporomandibular disorders (TMD), are more common in women than in men^{1,2} although the biological mechanisms responsible for this gender disparity are poorly understood
- Observational studies suggest that TMD pain is greatest during the late luteal phase of the menstrual cycle and during menses when estrogen levels quickly decline^{3,4}
- Also, women with TMD who use hormonal contraception report greater levels of daily pain compared to women not taking hormonal contraception
- The aim of this study is to evaluate gynecological characteristics that are putative risk factors for TMD: parity, use of hormonal contraception, and self-reported pain levels and psychological symptoms over the course of the menstrual cycle

Methods

- The OPPERA (Orofacial Pain: Prospective Evaluation and Risk Assessment) project was designed to identify risk factors for TMD
- Subjects were recruited at four U.S. study sites from 2006-2008
- This analysis used data from female participants in OPPERA's baseline case-control study: 155 women with chronic TMD and 925 women without TMD
- Cases had ≥6 month history of TMD symptoms and had tender muscles/joints during examination using RDC/TMD criteria⁵. Controls had no history of TMD symptoms⁶
- Each participant provided questionnaires to evaluate their gynecological history in addition to a Prospective Record of the Impact and Severity of Menstruation (PRISM) diary to investigate pain and psychological distress over 28 days (i.e. one menstrual cycle)

- Logistic regression models were used to evaluate the association between TMD case status and each gynecologic risk factor
- Mixed effects models were used to evaluate the association between each symptom measured by the PRISM diary and TMD case status and the phase of the menstrual cycle
- All models were adjusted for study site, race, and age

Results

- Women with TMD reported higher levels of pain in multiple body regions as well as higher psychological distress throughout the menstrual cycle compared to women without TMD
- Women with TMD also reported more severe pain in several bodily regions (particularly the pelvic region) during the follicular phase of the menstrual cycle than TMD-free women

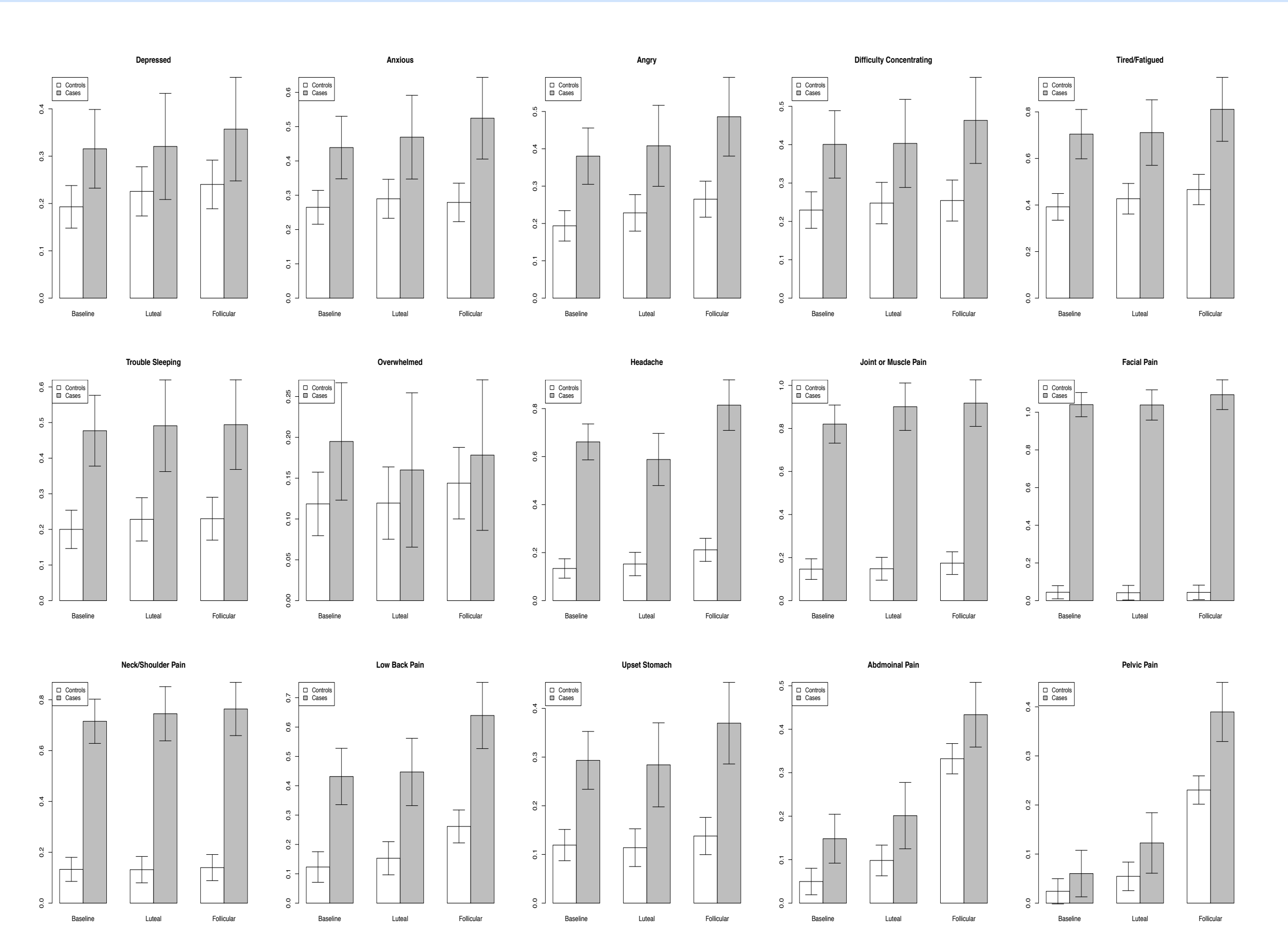


Figure 1. PRISM symptoms vary over the course of the menstrual cycle. The mean level of each symptom is shown for late luteal phase and early follicular phase

- Current use of hormonal contraception (HC) was weakly associated with TMD, and the association was no longer statistically significant after adjusting for race and age
- Greater odds of TMD was associated with use of HC for five years or longer and with using HC to treat pain, however using HC for other reasons (bleeding, contraception) was not significantly associated with case status
- Self-reported dysmenorrhea was associated with a higher odds of TMD
- Self-reported severe premenstrual symptoms (PMS) were also associated with a higher odds of TMD

Table 1. TMD cases and controls according to putative risk factors and associated odds ratios

Putative risk factor	Category	TMD controls	TMD cases	Fully adjusted odds ratios (95% confidence intervals)	P value
History of HC	Current user	152	36	1.9 (1.1, 3.5)	0.0003
	Former user	466	90	1.7 (1.0, 2.7)	
	Never used (ref)	300	26		
Main reason for HC use	Pain	90	25	2.5 (1.3, 4.6)	0.0001
	Other	520	103	1.7 (1.0, 2.7)	
	Never used (ref)	300	26		
Parity	No children	672	101	0.5 (0.3, 0.7)	0.048
	One or more children	250	54		
Pain during menstruation	Severe	52	12	2.8 (1.3, 6.3)	0.0057
	Moderate	231	57	2.2 (1.3, 3.7)	
	Mild	416	61	1.3 (0.8, 2.1)	
	None (ref)	223	25		
Pre-menstrual symptom severity	Severe	45	15	2.4 (1.2, 4.9)	0.103
	Moderate	212	35	1.0 (0.6, 1.7)	
	Mild	405	67	0.9 (0.6, 1.4)	
	None (ref)	248	36		

Conclusions

- A weak association between current HC use and TMD case status was noted, however a stronger association was observed with long-term use (>5 years) and TMD case status
- Dysmenorrhea and severe PMS symptoms were both strongly associated with TMD
- These results suggest that female reproductive hormones might contribute to chronic TMD and provide evidence that pain during menstruation may increase women's risk of developing more serious chronic pain conditions
- Further study on the association between HC use and TMD is needed

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