

# Overexpression of MMPs, cytokines, and RANKL/OPG in temporomandibular joint osteoarthritis and their association with joint pain, mouth opening, and bone degeneration: A preliminary report

Por: [Cafferata, EA](#) (Cafferata, Emilio A.)<sup>[1,2]</sup>; [Monasterio, G](#) (Monasterio, Gustavo)<sup>[1]</sup>; [Castillo, F](#) (Castillo, Francisca)<sup>[1]</sup>; [Carvajal, P](#) (Carvajal, Paola)<sup>[3]</sup>; [Flores, G](#) (Flores, Guillermo)<sup>[4]</sup>; [Diaz, W](#) (Diaz, Walter)<sup>[4]</sup>; [Fuentes, AD](#) (Fuentes, Aler D.)<sup>[5,6]</sup>; [Vernal, R](#) (Vernal, Rolando)<sup>[1,3]</sup>

[Ver número de ResearchID y ORCID de Web of Science](#)

## ORAL DISEASES

DOI: 10.1111/odi.13623



Acceso anticipado: SEP 2020

Tipo de documento: Article; Early Access

[Ver impacto de la revista](#)

## Abstract

**Objective** This study aimed to determine the expression of distinct matrix metalloproteinases, cytokines, and bone resorptive factors in temporomandibular joint osteoarthritis (TMJ-OA) patients and their association with joint pain, mouth opening, and subchondral bone degeneration. **Materials and methods** Twelve patients affected with TMJ-OA (n = 5), disk displacement without reduction (DDWoR) (n = 3), or disk displacement with reduction (DDWR) (n = 4) were selected. Joint pain was quantified by using visual analog scale, mouth opening was quantified at the maximum pain-free aperture, and bone degeneration was quantified using joint imaging. Synovial fluid samples were collected and immediately processed for cell and synovial fluid recovering. From cells, the MMP-1, MMP-2, MMP-8, MMP-13, IL-6, IL-23, and TNF-alpha expression was quantified by qPCR. From synovial fluid, the RANKL and OPG levels were quantified by ELISA. **Results** Higher levels of MMP-1, MMP-8, MMP-13, IL-6, IL-23, TNF-alpha, and RANKL/OPG ratio were detected in TMJ-OA compared with DDWoR and DDWR patients (p < .05). Joint pain significantly correlated with TNF-alpha levels (r = .975, p = .029). Besides, imaging signs of bone degeneration significantly correlated with RANKL/OPG ratio (r = .949, p = .042). Conversely, mouth opening did not correlate with any of the analyzed mediators. **Conclusion** During TMJ-OA, a pathological response characterized by the overexpression of TNF-alpha and RANKL/OPG could be involved in joint pain and subchondral bone degeneration.

## Palabras clave

**Palabras clave de autor:** [cytokines](#); [MMPs](#); [OPG](#); [RANKL](#); [temporomandibular osteoarthritis](#)

**KeyWords Plus:** [NECROSIS-FACTOR-ALPHA](#); [SYNOVIAL-FLUID](#); [DIAGNOSTIC-CRITERIA](#); [PROINFLAMMATORY CYTOKINES](#); [MATRIX METALLOPROTEINASES](#); [RHEUMATOID-ARTHRITIS](#); [RECEPTOR ACTIVATOR](#); [EXPRESSION](#); [DISORDERS](#); [OSTEOPROTEGERIN](#)

## Información del autor

### Dirección para petición de copias:

Universidad de Chile Univ Chile, Periodontal Biol Lab, Fac Dent, Santiago, Chile.

Universidad de Chile Univ Chile, Inst Res Dent Sci, Fac Dent, Santiago, Chile.

**Dirección correspondiente:** Vernal, R (autor correspondiente)

+ Univ Chile, Periodontal Biol Lab, Fac Dent, Santiago, Chile.

**Dirección correspondiente:** Fuentes, AD (autor correspondiente)

+ Univ Chile, Inst Res Dent Sci, Fac Dent, Santiago, Chile.

### Direcciones:

+ [ 1 ] Univ Chile, Periodontal Biol Lab, Fac Dent, Santiago, Chile

+ [ 2 ] Univ Cient Sur, Sch Dent, Dept Periodontol, Lima, Peru

+ [ 3 ] Univ Chile, Dept Conservat Dent, Fac Dent, Santiago, Chile

+ [ 4 ] Univ Chile, Dept Prosthesis, Fac Dent, Santiago, Chile

+ [ 5 ] Univ Chile, Inst Res Dent Sci, Fac Dent, Santiago, Chile

+ [ 6 ] Univ Chile, Inst Biomed Sci, Oral Physiol Lab, Fac Med, Santiago, Chile

**Direcciones de correo electrónico:** [aler.fuentes@odontologia.uchile.cl](mailto:aler.fuentes@odontologia.uchile.cl); [rvernal@uchile.cl](mailto:rvernal@uchile.cl)

## Financiación

Entidad financiadora	Número de concesión
FONDECYT grant from the Chilean Governmental Agencia Nacional de Investigacion y Desarrollo (ANID)	1181780
Graduate School of the Faculty of Dentistry, Universidad de Chile	
ANID	21170297

[Ver texto de financiación](#)

## Editorial

WILEY, 111 RIVER ST, HOBOKEN 07030-5774, NJ USA

## Información de la revista

- **Impact Factor:** [Journal Citation Reports](#)

## Categorías / Clasificación

**Áreas de investigación:** Dentistry, Oral Surgery & Medicine

**Categorías de Web of Science:** Dentistry, Oral Surgery & Medicine

## **Información del documento**

**Idioma:**English

**Número de acceso:** WOS:000572632500001

**ID de PubMed:** 32871032

**ISSN:** 1354-523X

**eISSN:** 1601-0825