

## RAPORTEURS

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## AFFILIATION

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## study

# Chronic periodontitis is associated with erectile dysfunction: a case-control study in a European population

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## RELEVANT BACKGROUND

Erection is a neurovascular phenomenon that culminates in an increase of the arterial flow within the hypogastric penile bed, followed by the activation of the veno-occlusive mechanism of the corpora cavernosa in a hormonal and psychological environment. Erectile dysfunction (ED) is defined as the inability of the male to attain and maintain an erection of the penis sufficient to allow satisfactory sexual intercourse (NIH Consensus Conference 1993). ED has a multifactorial aetiology, and the most common cause is vascular disease.

There is increasing evidence that chronic periodontitis (CP) can cause endothelial dysfunction. Periodontal bacteria or a higher systemic level of pro-inflammatory cytokines can cause dysregulation of the endothelium, which may lead to atheroma plaque formation at the intima of medium and small vessels. This dysregulation may affect penis vascularisation and erection. The available studies that correlate CP and ED are limited and generally inconclusive. There is only a single published clinical trial, involving a Turkish population, which showed that periodontal treatment reduced the severity of ED.

## AIMS

The objective of this observational study was to assess the association of CP and ED through the comparison of related clinical and biochemical variables.

## MATERIALS AND METHODS

This observational case-control study was conducted on patients from the urology service of the San Cecilio University Hospital (Granada, Spain) from January 2015 to June 2017.

Cases were patients from the hospital's andrology unit newly diagnosed with ED, according to the International Index of Erectile Function (IIEF), an internationally accepted questionnaire-based index for diagnosing ED. Control patients, recruited from the urology service, had consulted the unit for urological causes not related to ED.

Inclusion criteria were: age between 18 and 70 years and >11 teeth in the mouth. Exclusion criteria were: previous history of periodontal treatment, treatment with atenolol or hydrochlorothiazide, hypertension without treatment, use of antibiotics, psychiatric disorders, neoplastic disease, HIV, and systemic infections.

Sociodemographic data were gathered from each patient: age, alcohol consumption (g/day), tobacco consumption (cigs/day), pathology related to diabetes and cardiovascular disease (CVD). The IIEF score was also gathered.

Periodontal examination included: probing pocket depth (PPD), clinical attachment loss (CAL), bleeding on probing (BoP), presence of supragingival plaque, and a modification of the Periodontal Inflammatory Severity Index (PISIM). Periodontitis was diagnosed when  $\geq 4$  teeth showed  $\geq 1$  site with: active BoP, PPD  $\geq 4$ mm, and CAL  $\geq 3$ mm.

Testosterone (ng/dl), C-reactive protein (CRP) (mg/L), total cholesterol (mg/dl), triglycerides (mg/dl), LDL (mg/dl), HDL (mg/dl), glucose (mg/dl), and glycosylated haemoglobin (Hb1Ac) were also measured.

Sociodemographic, periodontal, urological, and biochemical variables were compared between groups. The Mann-Whitney test was used and multivariate logistic regression analysis was applied to identify the factors associated with being an ED patient.

# results

- A total of 158 men were included in the study: 80 cases with ED and 78 controls.
- The comparison of the sociodemographic variables between the two groups showed that only diabetes ( $p=0.04$ ) and CVD ( $p=0.04$ ) were higher in the case group.
- The comparison of the biochemical variables showed that triglycerides, CRP, and HbA1c levels were significantly higher in the case group ( $p<0.01$ ,  $p=0.02$ , and  $p=0.04$  respectively).
- The comparison of the periodontal variables showed that oral hygiene, BoP, and present teeth were comparable between the two groups. However, the case group showed a higher number of sites with PPD 4-6mm and CAL >3mm ( $p=0.05$  and  $p<0.01$ , respectively), translating into 74% periodontitis patients in the case group compared with 58% in the control group ( $p=0.05$ ).
- The multivariate logistic regression analysis shows that CP is an independent risk factor for ED. Periodontitis patients are more likely to present ED (OR=2.17) after adjusting for other risk factors. This likelihood was greater than that showed by CVD or the upper limits of triglycerides.



## LIMITATIONS

- Diagnosis of vascular ED was by "exclusion", thus other origins of ED cannot be completely ruled out.
- A questionnaire was used to diagnose ED and some patients may have found it difficult to understand and complete.
- It is a case-control study, and so subject to selection and confusion bias.
- The significance of the association between CP and ED depends on the definition of CP.



## CONCLUSIONS

- The results showed an association between CP and ED, with ED patients presenting a worse periodontal condition.
- CP seems to play a role as a risk factor in the pathogenesis of ED, independently of other morbidities.
- Longitudinal studies that assess penile endothelial dysfunction with an objective technique are needed.



## IMPACT

- Urologists may need to consider oral-health status when assessing and treating erectile dysfunction.



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