Epidemiology of periodontal diseases in Uruguay: past and present

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Abstract

This article aims to review periodontal disease in Uruguay. International databases (PUBMED, SCOPUS, EBSCO, SciELO) were consulted. The search also included national sources (National Library of Dentistry, Documentation Center of the School of Dentistry, Ministry of Public Health, National Directorate of Health of the Armed Forces) which were searched manually. The studies found provided useful epidemiological information and allowed us to conduct a historical review of epidemiology concepts, etiopathogenesis and hegemonic currents in periodontics. Gingival disease is the most prevalent disease, while destructive periodontal conditions mainly affect adults. Age, geographical origin, social class and smoking are indicators strongly associated with these disorders. From the close reading of the articles collected we can make suggestions to be considered in future epidemiological surveys.

Keywords: epidemiology, periodontal diseases, prevalence.

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Introduction and objectives of the review

Periodontal diseases are multifactorial, chronic and socially patterned conditions. Their study should include their clinical and pathophysiological presentation as well as their social pattern of production and development\(^{(1-3)}\).

Epidemiological research is useful to design health policies, identify vulnerable populations, strategically reallocate resources to reduce risks, prevent damage and treat the most prevalent pathologies, as well as to suggest hypotheses to develop research lines. Oral diseases qualify as major public health problems around the world\(^{(4)}\).

The aim of this work was to analyze the available information on epidemiological studies related to periodontal disease in Uruguay.

Methodology and literature search strategy

We arbitrarily decided to start the search in 1900 up to December 2015, as we knew that several works were in their publication phase and that they met the inclusion criteria proposed for this review. The steps followed are illustrated in Fig. 1 (Search Strategy).
**Search date**  
From 1900 to December 2015. Five researchers (E.A., V. G., M. M., N.A., A.D.) reviewed and selected the papers. This team was advised by a professional with a Bachelor’s Degree in Library Science (C.S.).

**Inclusion criteria**  
Epidemiological studies of periodontal disease in Uruguay without restriction on account of type of study, language and age of the populations analyzed. They should also include the periodontal variables, diagnosis or indices used.

**Search terms**  

**Databases**  

**Key journals consulted**  
Periodontology 2000, Journal of Periodontology, Annals of Periodontology, Journal of Clinical Periodontology, Odontoestomatología, Odontología Uruguay, Anales de la Facultad de Odontología (UdelaR), (these last two are only indexed in the School of Dentistry Information Center).

In addition, interviews were conducted with national experts in the field to find out about publications which may not have been indexed. All of this was accompanied by a cite-by-cite follow-up of the papers obtained to expand the search. From the sources mentioned, 355 articles were recovered. Once the different stages of reading and selection were completed, 18 papers were included in the final review.

**Development and discussion**
Epidemiology is the study of the distribution and determinants of health-related states in specific populations and the application of this study to control health problems. Its objectives are to know the prevalence, extent and severity of the pathology, to elucidate its etiology (risk factors/indicators), to evaluate and design preventive and treatment strategies\(^5\)\(^,\)\(^6\).

According to the latest national census of 2011, Uruguay has 3,286,314 inhabitants. Nearly 50% live in Montevideo and a similar percentage are female. Marked by a constant decrease in the birth rate, the national “demographic pyramid” reflects a greater number of people over 50 years old (compared to the 2004 census) as a result of an increase in life expectancy\(^7\). Data from the latest national survey reveal that 28.8% smoke, 90.8% eat less than five daily servings of fruits and vegetables, 38% are hypertensive and 64.7% are overweight or obese\(^8\).

Since the beginning of the 20th century there have been reports about the study of oral health in Uruguay\(^9\). However, an “almost” exclusive approach to the problem is evident: “Dental Caries”. However, periodontal pathology has been rarely reviewed\(^10\)\(^–\)\(^12\). According to experts, this has had a significant impact on undergraduate and postgraduate teaching of Periodontics, with a small number of hours and teachers, which is detrimental to the interest in the field as well as to actually solving periodontal problems\(^13\).

It is difficult to accurately estimate the prevalence and incidence of chronic diseases that affect a large part of the world population, among other things because of the lack of consensus when defining “a case of disease”\(^14\)\(^–\)\(^17\), which also happens with periodontal disease. Out of 3400 articles retrieved from a systematic review, whose aim was to analyze the definitions of periodontal diseases, only 15 were selected. This illustrates the varied criteria that exist for establishing a cut-off point when determining a case of periodontitis and/or gingivitis, including the main variable thresholds\(^18\). This complexity is reflected today
because the American Academy of Periodontics (AAP) as well as the European Federation of Periodontics (EFP) present dissimilar definitions of the disease\(^{(19-21)}\).

Several indexes and registration systems were used over time. The paradigms on etiopathogenesis and the available diagnostic instruments determined them\(^{(22)}\). The Community Periodontal Index of Treatment Needs (CPITN) has been a tool widely used in epidemiological surveys in South America\(^{(23,24)}\). Considered a “partial” recording system (it only uses six teeth) and despite the modifications that were made later, this indicator has been questioned since it underestimates or overestimates the “amount of disease”, mainly regarding age\(^{(25,26)}\).

As can be seen from the studies reviewed, most use convenience samples which, though easy to obtain, are biased, which makes them difficult to interpret. Probabilistic and population-based samples represent valid strategies when quantifying population diseases, but they require logistics, significant investments and time, which often makes it impossible to conduct them\(^{(27)}\).

In addition to these difficulties, there is a lack of a detailed description of relevant methodological aspects in the papers published\(^{(28)}\). Not reporting the type of periodontal probe used, the intra and inter-examiner calibration stages, the sampling techniques used as well as the characteristics of the study population, undermine the truth of what is reported\(^{(29)}\). Based on the information obtained, the papers were grouped into: studies conducted from specific population groups and, on the other hand, nationwide studies.

**Studies from specific population groups (Table 1)**

Most of them were conducted in Montevideo\(^{(13,30-33)}\), except one survey carried out in the Department of Canelones\(^{(34)}\). The convenience samples with the largest number of
individuals corresponded to multiple institutions within each location\(^{(35,36)}\). In addition, almost all of the surveyed population use public health services\(^{(13,30–40)}\).

The pioneering studies date from the middle of the 20th century\(^{(13,30–33)}\). Several authors referred to the paradigm that considers that the causal factors were in direct contact with the tooth as “local”, while the etiology of the disease that was “remote” from the periodontium was described as “host-level”\(^{(41,42)}\). Most methodological designs, mainly observational, aimed at possible associations with risk factors/indicators (occlusal problems, vitamin deficiencies or hematological disorders)\(^{(13,31,32)}\).

According to the hegemonic current of medicine, periodontal charts were discriminated between “Inflammatory” (Gingivitis and Periodontitis) and “Degenerative” (Gingivosis and Periodontosis). They were considered degenerative since they showed excessive clinical symptoms but with a small number of local irritants\(^{(43,44)}\).

Studies published since 1970 can be grouped according to arbitrary age groups.

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**TABLE 1: STUDIES FROM SPECIFIC POPULATION GROUPS**

<table>
<thead>
<tr>
<th>Department</th>
<th>Population</th>
<th>Periodontal index</th>
<th>Risk indicator</th>
<th>Prevalence/Extension and Severity</th>
<th>Association</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Montevideo(^{(13)})</td>
<td>Patients of the School of Dentistry</td>
<td>Symptoms, visual signs of inflammation, PD</td>
<td>Age, sex</td>
<td>88% P Dis), (80% inflammatory origin), 33% incipient, 19.33% intermediate and 6.33% severe</td>
<td>P Dis increases with age. More prevalent in men than women</td>
<td></td>
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<tr>
<td>Montevideo(^{(30)})</td>
<td>100 postgraduate patients, School of Dentistry</td>
<td>Symptoms, visual signs of inflammation, PD</td>
<td>Hematological disorders</td>
<td>52% advanced and generalized PD, 23% advanced and localized PD, 12% incipient and generalized PD, 8% incipient and localized PD 5% no PD &gt; 3mm</td>
<td>Association between PDs and various blood disorders.</td>
<td></td>
</tr>
<tr>
<td>Montevideo(^{(31)})</td>
<td>20 patients of the</td>
<td>Symptoms, visual signs</td>
<td>Undetermined</td>
<td>Patients with P Dis show an</td>
<td>“Dystrophic” conditions-</td>
<td></td>
</tr>
<tr>
<td>School of Dentistry</td>
<td>Students of the School of Dentistry, male and female 20 – 24 years old</td>
<td>Symptoms, visual signs of inflammation, PD</td>
<td>Joint alteration s, diet</td>
<td>acidifying diet lacking fruits, vegetables, hemoglobin and ascorbic acid.</td>
<td>paradentosis are mentioned</td>
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<tr>
<td>Montevideo&lt;sup&gt;(32)&lt;/sup&gt;</td>
<td></td>
<td>&gt;90% gingival inflammation, 44% mobility and 64% migration; PD ≤3mm=58%, PD 4 – 6mm=16% and PD &gt;6mm=6%. Gingival injuries= 20%, Bone and Gingival injuries 76%, incipient bone injuries= 58%, intermediate bone injuries= 16% and deep bone injuries= 2%</td>
<td>96% joint problems. 95% inappropriate, acid diets (excess of meat or carbohydrates) close to 90%, lacking minerals=45% and vitamins 75%</td>
<td>As for joint alterations, authors conclude “that it is not possible to deduce an association”; regarding diet, “there is most probably an association”. Gingivosis is mentioned (dystrophic alterations of soft tissues)</td>
<td></td>
<td></td>
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<tr>
<td>Montevideo&lt;sup&gt;(33)&lt;/sup&gt;</td>
<td>200 private patients and patients of the School of Dentistry</td>
<td>GR, PD, Mobility and Migrations</td>
<td>Unspecified</td>
<td>According to the authors “it is almost impossible to relate cause and effect”</td>
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<td></td>
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<tr>
<td>Canelones&lt;sup&gt;(34)&lt;/sup&gt;</td>
<td>100 individuals, 9 – 18 years old (elementary school, high school and state clinics)</td>
<td>CPITN, (Four surfaces), (PI), (GI)</td>
<td>Age</td>
<td>Although the aim is to evaluate juvenile periodontitis, 8% shows Code 3 and 4.</td>
<td>According to the authors, the condition is more frequent between ages 12-14</td>
<td></td>
</tr>
<tr>
<td>Unspecified&lt;sup&gt;(35)&lt;/sup&gt;</td>
<td>261 children (2 to 6 years old from 132 state schools and dental clinics and 129 in hospitals)</td>
<td>IAG, Follicles, GI and PI</td>
<td>Age, several diseases.</td>
<td>30.6% with IAG, prevalence in ages 2, 3, 4 was higher compared to 5 &amp; 6 (p&lt;0.01). GI. 83.9% Gl. (it varies with age, 69.3% of expanded inflammation &gt;3 teeth. PI. 98.8%, Follicles 7.6% of the population</td>
<td>No association between general diseases and gingival signs. IAG higher in hospitalized patients (p&lt;0.001) and specifically infectious (p&lt;0.01). GI was higher in those with inflammation of the attached gingiva (p&lt;0.01). No association between PI and GI.</td>
<td></td>
</tr>
<tr>
<td>Montevideo&lt;sup&gt;(36)&lt;/sup&gt;</td>
<td>1162 individuals, 18-75 years old (36.9 +12.7). 7</td>
<td>CPITN</td>
<td>Age</td>
<td>≥ 50% showed PD between 4 – 6mm; &lt;8% advanced PD; &lt;13% show</td>
<td>As age increases, there are more people with PD &gt;6mm as well as CAL.</td>
<td>calibrated</td>
</tr>
<tr>
<td>Montevideo (^{(37)})</td>
<td>76 HIV (1 – 17 years old, 7.5±3.0) vs. 86 healthy (3 – 12 years old, 6.5± 2.88) C.H.P.R.</td>
<td>Gingivitis (WHO)</td>
<td>Gingivitis: 75% of the population</td>
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<tr>
<td>Montevideo (^{(38)})</td>
<td>39 have coagulopaties CHPR (2 – 15 years old; 8.62± 4.20) vs. 78 healthy (3 – 12 years old, 6.5± 2.88) C.H.P.R.</td>
<td>Gingivitis (unspecified index)</td>
<td>Gingivitis: 43% of the population</td>
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<tr>
<td>Montevideo (^{(39)})</td>
<td>68 asthmatic children between 0 – 14 years old (49 children that use inhalers) C.H.P.R.</td>
<td>Gingivitis: PI, inflammation of the gingiva and soft tissue dehydration</td>
<td>Use of inhaler for non-infectious respiratory diseases</td>
<td>Gingivitis: 83.7% of the population</td>
<td></td>
<td></td>
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<tr>
<td>Montevideo (^{(40)})</td>
<td>72 persons, 15-35 years old, 57 M and 15 W</td>
<td>CPI</td>
<td>Drug addiction</td>
<td>Drug addiction</td>
<td>16.6% gingival health, 65.3% gingivitis and 18.1% periodontitis</td>
<td>People between 25 to 35 years old show less gingival health when compared to those included in the range of 15 to 25 (4 to 8), and show a greater number of individuals with periodontitis (12 to 1)</td>
</tr>
</tbody>
</table>

**References:** HIV - Human Immunodeficiency Virus; CHPR - Pereira Rossell Hospital; MEC - Ministry of Education and Culture; GI – Gingival Inflammation Index (Löe and Silness); PI – Plaque Index (Löe and Silness); BoP - Bleeding on probing; PD – Probing Depth; CAL – Clinical Attachment Loss; JP - Juvenile Periodontitis; CPITN – Community
Epidemiological studies in children and/or adolescents

The degree of inflammation of the gingival tissues as well as the biofilm deposits were the most evaluated periodontal conditions. Plaque-induced gingival disease (ex chronic gingivitis) reached figures between 43% and 84%. In addition, when age is stratified, greater pathology can be seen in older people\(^{35,37–39}\). The advent of the CPITN allowed for the evaluation of the attachment apparatus. This index was used in 100 young people of which only 1% showed localized aggressive periodontitis (Code 4 - PD > 6mm in incisors and molars)\(^{34}\).

Epidemiological studies in adults

Rötemberg et al. found in 2015 that bleeding on probing reached 65%, while periodontitis was below 20%. When stratified by age groups, the 25-35 group had worse periodontal records compared to the group aged 25 or less. We must highlight, in this last case, that the definition of “case of periodontitis” was not reported\(^{40}\).

Haskel et al. found in 1988 that dental plaque and gingival inflammation reached 95% of the records. However, only 8% recorded a probing depth > 6mm; 87% of the total localized periodontitis. Attachment loss should be considered with age to have a better understanding. Between the ages of 20 - 29, the mean was 2.80mm (±2.50mm) and for those aged 60 or more, it was 6.02mm (±2.09mm). In turn, sites with attachment loss lower than 2mm were found mainly in younger people (<20 years and 20 - 29 years) and 4% were in the group aged >60. In addition, attachment loss >6mm increased noticeably from 1.8% (<20 years) to 44.3% (>60 years)\(^{36}\).
National studies (Table 2)

This table includes representative studies at a national level or involving several departments. Five of these six works focused on children and adolescents, while the others considered adults and seniors. Most of them involved calibration procedures and random assignment in the selection of individuals⁴⁵–⁴⁹.

<table>
<thead>
<tr>
<th>Sample</th>
<th>Periodontal index used</th>
<th>Risk indicator</th>
<th>Prevalence/Extension and Severity</th>
<th>Variable association</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>9000 children of the M.E.C. clinics, 64 geographic locations (30 outside the capital and 34 in Montevideo); 72% in the metropolitan area, 16.6% in the suburban area, 9.40% in concentrated rural areas and 2% in isolated rural areas⁴⁵</td>
<td>Gingivitis</td>
<td>Geographic areas</td>
<td>40.6% gingivitis in urban centers, 45% gingivitis rural areas outside the capital</td>
<td></td>
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</tr>
<tr>
<td>3457 (2281 outside the capital and 1176 in Montevideo) Schools in Montevideo: CATEGOR Y 1 (low socio-economic status) CATEGOR Y 2 School entry 1848</td>
<td>Gingivitis (WHO) Oral hygiene (WHO)</td>
<td>age, sex, school grade and geographical area:</td>
<td>Gingivitis: 6 years – 31.5%; 7 years - 38.5%, 11 years – 50.6% and 12 years- 57.7% School entry School completion Gingival pathology Gingival pathology: 0 – 65.5% 0 – 45.1% 0.1 - 1 – 33.0% 0.1 – 1 – 46.7% 1.1 - 2 – 1.5% 1.1 – 2 – 8.3% Plaque scores Plaque scores: 0 – 1.4% 0 – 1.9% 1 – 32%</td>
<td>Correlation between gingival condition and oral hygiene. There were no differences between sex and gingival alterations either at school entry or completion.</td>
<td>Calibrated examiners (error 0.5%)</td>
</tr>
<tr>
<td>WHO criteria: 0 – Healthy, 1 – BoP y 2 – Calculus</td>
<td>Age, sex, geographica l regions</td>
<td>School completion population</td>
<td>Gingival alterations/sex Men - 9.8%; Women - 8.3%.</td>
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<td>1544 school-age children (12 year old), urban schools, Area 1 – Montevideo, Area 2 – department s with no dry border with Brazil, and Area 3 – department s with dry border with Brazil) (48).</td>
<td>At age 6 – 0.0%, at 7-10.6%, at 11 – 18.2% and at 12 – 18% had BoP. School entry: BoP 0 – 88.6%, 0.1 – 1.0 – 11.4%, 1.1-2.0 – 0.0%. Plaque: 0 – 9.9%, 1/3 – 47.6%, 2/3 – 37.7%, 3/3 – 4.8%. School completion: BoP 0 – 82.4%, 0.1-1.0 – 16.9%, 1.1 – 2.0 -0.7%. Plaque: 0 – 14.1%, 1/3 – 56.6%, 2/3 – 27.9% y 3/3 – 1.3%.</td>
<td></td>
<td>There are no differences either in gingival conditions or plaque amount in the different geographical regions. The more plaque, the greater the gingival alterations.</td>
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<tr>
<td>418 individuals, 15 to 24 years (18 department s, except</td>
<td>CPI</td>
<td>Sex, age</td>
<td>Calibrated examiners (error 0.5%)</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>PD calibration 0.6 – 1.0 inter and intra-examiner</td>
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</table>

Rural areas show a higher plaque rate (2 – 70.3% and 3 – 13.7%), Montevideo being the area with the lowest plaque rate (2.6%).
the capital\textsuperscript{(49)}.

| Age: 35 – 44, n=358/65 – 74, n=411\textsuperscript{(59)} | CPI | Sex, age, area, socioeconomic status, health insurance, tobacco, alcohol and oral hygiene habits | 40.8% (35.9 – 46) BoP; 21.8% (17.9 – 26.3) moderate periodontitis; 9.12% (6.8 – 12.1) severe periodontitis | Households with no member with university studies showed the worst periodontal conditions. The lack of dental assistance was connected with moderate periodontal disease. Smoking was connected with the worst periodontal health conditions in the elderly. | PD calibration 0.6 – 1.0 inter and intra-examiner. |

References: HIV – Human Immunodeficiency Virus, CHPR - Pereira Rossell Hospital; MEC - Ministry of Education and Culture; GI – Gingival Inflammation Index (Löe and Silness); PI – Plaque Index (Löe and Silness); BoP Bleeding on probing; PD – Probing Depth; CAL – Clinical Attachment Loss; JP - Juvenile Periodontitis; CPITN – Community Periodontal Index of Treatment Needs; CPI – Community Periodontal Index; WHO – World Health Organization; GR – Gingival Recession; IAG – Inflammation of the Attached Gingiva.

Population samples in children and adolescents

The World Health Organization stratifies people by age to conduct epidemiological studies. In addition, it considers schools as “ideal” centers in terms of sample collection, and specifies that 5 and 12 are key ages since they mark school entry and completion in the formal educational system as well as the beginning and end of the permanent arch\textsuperscript{(50)}.

In these cases, only the superficial periodontium was evaluated, and bleeding on probing was the indicator that made it possible to assess the presence of gingival disease\textsuperscript{(51)}. Additionally, the presence of dental biofilm and tartar was assessed. Regardless of the recording methodology used, there is a close connection between biofilm and gingival disease, which is corroborated in the world literature\textsuperscript{(52–54)}. In terms of prevalence, gingivitis (bleeding on probing) reaches 93% of the children surveyed\textsuperscript{(48)}. 
The most considered independent variables are age, geographical origin and socioeconomic status. The information collected reveals a directly proportional relation between chronological age and gingival pathology, both regarding frequency and severity, which is appreciated when analyzing the formal education entry/completion figures and making cutoffs in certain age groups\(^{(46,47)}\). The accumulation of dental plaque, eruption and dental exfoliation, the dental change and hormonal influences explain gingival inflammation\(^{(55)}\).

Geographical location shows a “disease gradient” since there is a higher prevalence of gingival pathology as we move away from the capital city or urban centers, with the most serious cases occurring in rural areas, except in private schools\(^{(45,46,48)}\).

The world literature clearly demonstrates the relationship between oral diseases and socioeconomic status\(^{(24,56,57)}\). In Uruguay, this variable was analyzed based on the categorization of public or private schools and through previously tested surveys\(^{(46,47,58)}\).

From the above it appears that in lower income populations the highest levels of gingivitis and dental biofilm are recorded\(^{(46–48)}\).

The sex variable has not been sufficiently reviewed. A survey shows that men are more prone to gingivitis than women (9.8% versus 8.3%) \(^{(46,47)}\).

Uruguayan adolescents have been “partially” examined so far. In the First National Survey of Oral Diseases of Uruguay, 418 people between 15 and 24 years old were surveyed. About 30% of them are “healthy” and 20% had an incipiently increased and mean probing depth (4-5mm). However, according to reports, these results are included in the age group up to 24 years old\(^{(49)}\).

Population samples on adults and the elderly

Lorenzo et al. 2015\(^{(59)}\) published data from the first national survey on the most common oral pathologies including periodontopathies. People over 35 were evaluated from 2 probabilistic and representative samples from the whole country. They applied WHO methodological for
epidemiological surveys to be able to make international comparisons. Therefore, a partial
recording system was used, evaluating 10 index teeth in 3 sites from vestibular (DV, V, MV)
and 3 from lingual/palatal (DP, P, MP) recording probing depth, tartar, bleeding on probing
and attachment loss. The following were defined as “case of periodontitis”: Moderate
Periodontitis - IPC> 2 (probing depth> 4mm) and CAL> 0 (CAL> 4mm); Severe Periodontitis
- IPC> 2 (probing depth> 4mm) and CAL> 1 (CAL> 6mm).

The logistic regression models applied allow us to conclude that bleeding on probing and the
moderate and severe forms of periodontitis were associated with worse socioeconomic
status (p = 0.018). The authors used the presence of at least one member with university
studies in the household as a socioeconomic indicator. There are several ways to find the
relationship between socioeconomic factors and periodontal disease(60). Zini et al. explain the
socioeconomic influence on severe forms of periodontitis due to an increased tendency to
tobacco smoking and to less efficient control of dental biofilm among those with lower
income(61). At the same time, lower income classes have an inadequate response to stressful
daily situations, which has an impact at a biological level with an inadequate response to
microbial aggression by periodontopathic pathogens(62). The worst conditions were found in
those who never used dental services (p = 0.032). This was confirmed in residents of the
Municipality of Guarulhos, Brazil(63). According to Frias et al., the low demand for dental
services is linked to the perception of oral health problems by the respondents, their income
and their age.

The relationship between smoking and periodontal disease has been long proven, mainly
due to the deleterious effect on periodontal tissues and the modulating effect on the host
response(64). In this case, the statistical association is only seen in the higher age group who
smoked more than 10 cigarettes a day since they had greater bleeding on probing and
greater periodontitis compared to those who did not smoke at all or did not smoke daily (p
<0.001). This finding is linked to how questions are posed in the methodology applied in this survey as well as the lower response rate of the adults age group.

Limitations and strengths of the review

The papers prior to 2000 have methodological deficiencies, which is a limitation since the conclusions drawn from them have insufficient evidence.

There are no sampling techniques, recording systems or standardized indices, which hinders comparisons among the different studies. Additionally, most of the information on epidemiology is descriptive with an insufficient analytical perspective, which complicates the determination of risk factors.

However, of the 18 papers that were finally included, 70% can only be found in national databases, which should be understood as a strength that demonstrates the extensive and exhaustive search, supplemented by a reference follow-up of each paper retrieved. This has made it possible to compile the history of periodontal disease in Uruguay, thus developing a substantial source of information for future systematic reviews.

Conclusions

- Gingival disease is the most prevalent periodontal pathology;
- Periodontitis affects mainly adults and the elderly, which is similar to what happens in the other Latin American countries;
- Adolescents have been poorly characterized;
- Age, geographical origin, socioeconomic status and tobacco consumption have been associated with periodontal disease.

We suggest that future surveys include: a special chapter for adolescents; full mouth record systems to reduce the underestimation of periodontal disease; gingival recession as a primary variable since it has an impact on the quality of life; analysis of the risk factors associated with periodontitis to identify more vulnerable populations; the perception that
patients have about their oral health from questionnaires previously validated for our population.

REFERENCES


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