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LETTER TO THE EDITOR

WILEY ORAL DISEASES

Tooth Loss and Dental Implant Outcomes—Where is dentistry going? A Survey by SIdP, the Italian Society of Periodontology and Implantology

Dear Editor,

Recently, the Italian Society of Periodontology and Implantology (SIdP) committed an extensive survey to evaluate tooth loss and actual success of dental implants in the population. We would share the main outcomes with the present letter.

Periodontal disease is a chronic inflammatory destruction of tissue surrounding teeth associated with infection of specific anaerobic pathogens. Recent data from epidemiological studies demonstrated that periodontal diseases significantly affect the population in industrialised countries with prevalence ranging between 30% and 40% for moderate-severe disease forms (Aimetti et al., 2015). Smoking habits, uncontrolled diabetes and poor oral hygiene were significant predictors of disease progression. Conversely, a growing body of evidence suggested that systemic inflammation associated with periodontal disease may be linked with severe systemic conditions including cardiovascular diseases, diabetes and associated complications (Cairo et al., 2008; Tonetti & Van Dyke, 2013). Meta-analyses confirmed that incidence of severe forms of periodontitis was stable around 11% of population in the last two decades (Kassebaum et al., 2014) and progression hesitated in tooth loss with significant aesthetic and functional impairments for patients. Dental implants are considered today as the primary treatment option to replace missing teeth, even if higher incidence of biological complications is described in patients with history of treated periodontitis (Sgolastra, Petrucci, Severino, Gatto, & Monaco, 2015). Information concerning tooth loss and dental implants is generally referred to specific experimental environments, while information concerning the naïve population is scanty.

To evaluate tooth loss and actual success of dental implants in the population, a survey was committed by SIdP to a specialised research institute (Market Research Institute KEY-STONE (www.dentalmonitor.com), according to criteria for collecting self-reported measures to facilitate epidemiologic investigations (Blicher, Joshipura, & Eke, 2005). A sample of 2,157 subjects (mean age 53 years; range 35–74 years) was randomly selected in the Italian population according to ISTAT (Italian National Institute of Statistics), and then contacted for interviews (50% by phone and 50% via web). Individuals were selected according to gender, age distribution, socio-economic levels and geographic areas to obtain a representative sample of the general population. The survey did not include individuals declaring an income lower than 8,000€/year because considered below the poverty line and impossible to reach with the common phone/web methodologies. A detailed questionnaire was then administered to each single participant to get a reliable picture of the population experience regarding periodontal disease, tooth extractions and implant placement.

When considering tooth loss as self-reported measure, the overall mean tooth mortality was 3.8 ± 0.3 for patient (including patients with no tooth loss); 66% of individuals reported at least one tooth extraction excluding wisdom teeth (Figure 1). Age and educational level were significant predictors of tooth mortality ($p < 0.0001$). Patients with self-reported history of periodontitis reported a higher mean tooth loss (10.1 ± 0.3 for single patient). Interestingly, very often (50%) no attempt of periodontal treatment before tooth extraction was described. This survey showed also that 59% of subjects replaced extracted teeth with a prosthesis (43% with fixed prosthesis and 16% with removable) and very often dental implants were used (46% of patients with prosthesis, 60% when considering fixed prosthesis only). The overall number of placed implants was higher in the period 2015–2017 compared to 2010–2014. This finding represents a temporal, increasing trend in using dental implants in the population. Furthermore, 11% of patients treated with implants reported long-term complications, mainly biological (82%) and biomechanical (11%); this percentage is 19% for patients who declared to never perform periodical checkup visits. At the time of survey, complications were solved in 26% and still persistent in 33% of patients, while in 46% implant removal was performed. Patients with history of periodontitis showed higher tendency for implant failure ($p < 0.0001$). The present survey reported also that 19% of implant-treated patients (74 of 400 individuals) did not accept a new implant treatment.

Data from the current survey depict a complex clinical scenario with high tooth mortality in the general population due to periodontitis. Possible reasons to explain this finding may be related with heterogeneity among patients, difference in operator experience, economic reasons and the use of tooth extraction as a "strategy" for treating periodontitis. Conversely, dentists very frequently applied dental implants irrespective to previous treatment of periodontitis and frequently peri-implant complications were reported. This situation should be carefully interpreted as part of an excessively

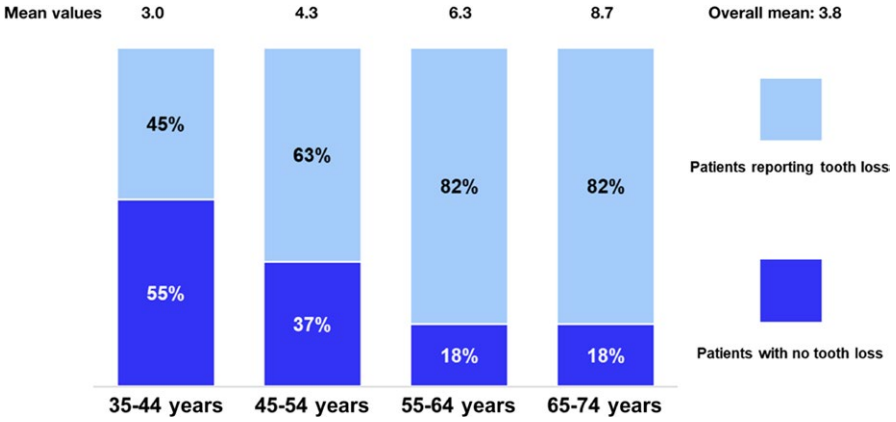

FIGURE 1 Population distribution (2,157 subjects) by age and average number of missing teeth (excluding wisdom teeth) [Colour figure can be viewed at wileyonlinelibrary.com]

implant-oriented modern dentistry, although data provided by clinical research reported high prevalence of peri-implant complications (Derks et al., 2016) and relative low predictability of peri-implantitis treatment (Jepsen et al., 2016). Conversely, several long-term studies showed high efficacy of dental treatments, leading to predictable long-term tooth retention (Axelsson, Nystrom, & Lindhe, 2004; Carnevale, Cairo, & Tonetti, 2007; Fonzar, Fonzar, Buttolo, Worthington, & Esposito, 2009; Salvi et al., 2014). These data should be carefully considered for definition of patient treatment plan and dental implants should be used in the rehabilitation of patients with tooth loss only when control of periodontitis is achieved (Costa et al., 2012).

The actual burden of tooth mortality in periodontal patients and the high risk of complications associated with overuse of dental implants (Giannobile & Lang, 2016) underline the importance to undertake public health policies aimed at promoting periodontal health for reducing dental mortality and risk of systemic co-morbidities associated with periodontal infection. There is a need to adopt specific policies by institutions and scientific societies to transfer the amount of evidence retrieved from clinical studies at the level of general population for improving public oral health and promote prevention. In addition, the possible rebound-effect of implant overuse in the population should be considered as a possible risk for patient dissatisfaction and a potential source of legal controversies. Furthermore, there is the huge necessity to improve periodontal education for general dentists. In fact, the level of knowledge and learning curve seem to affect the final decision-making in the treatment plan, leading to higher frequency of tooth extraction when practitioners showed lower level of education (Lang-Hua, McGrath, Lo, & Lang, 2014). The careful consideration of these elements may improve the overall quality of dentistry, bridging the gap between the outcomes provided by clinical research and the quality of treatment in the general population.

CONFLICT OF INTERESTS

None to declare.

AUTHOR CONTRIBUTIONS

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ORCID

Francesco Cairo http://orcid.org/0000-0003-3781-1715

Francesco Cairo[1]
Luca Landi[2]
Claudio Gatti[3]
Giulio Rasperini[4]
Mario Aimetti[5]
on behalf of the SIdP, the Italian Society of Periodontology and Implantology

[1]*Unit of Periodontology and Periodontal Medicine, University of Florence, Florence, Italy*
[2]*Private Practitioner Rome and Verona, Rome and Verona, Italy*
[3]*Private Practitioner Parabiago-Milano, Milano, Italy*
[4]*Department of Periodontology, University of Milan, Milan, Italy*
[5]*Department of Periodontology, University of Torin, Torin, Italy*
Email: cairofrancesco@virgilio.it

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