Prevalence of dentin hypersensitivity

Check for updates

BACKGROUND

Dentin hypersensitivity (DH) is an often chronic condition that can be challenging to manage. It's characterized by a sharp pain of limited duration that occurs when the exposed dentin experiences thermal, tactile, osmotic, chemical, or evaporative stimuli and cannot be attributed to any other dental problem or pathologic condition. Patients with DH suffer compromised oral health−related quality of life and a negative effect on their activities of daily life, such as speaking, eating, drinking, and brushing their teeth. The condition is diagnosed in various ways, such as clinical examination and self-reported questionnaire, response to stimulus, and the exclusion of other causes of the pain. Prevalence of DH has been reported to be as low as 1.3% and as high as 92.1%. A systematic review was done to estimate the prevalence of DH in various populations and to evaluate which factors might be influencing prevalence data.

METHODS

The literature search was conducted in the Medline via PubMed, Cochrane Library, Wiley Online Library, and Web of Science databases up to June 2018. The studies included were cross-sectional in design. Sixty-five studies reporting on 77 studies were included in the meta-analysis. Sixty-eight percent (52 studies) were determined to present a high risk of bias.

RESULTS

Characteristics of Studies

Forty percent of the studies were done in Europe and 38% in Asia, with 51% conducted in or before 2010. Forty percent were performed at a university clinic or campus and 39% in a community setting. Sixty-five percent did not specify the type of funding received. The 77 studies included 97,845 participants, with a median of 700 and a range from 40 to 12,692. Sixty-five percent were adults and 43% were from general dental practices. Samples were taken from a single site in 52% of cases, by convenience of investigators in 40%, and randomly in 39%.

Diagnostic and measurement methods relied on a response to stimulation during the clinical examination in 48% of cases, on questionnaire alone in 30%, and by questionnaire and clinical examination only when the questionnaire reported a positive response in 22% of cases. The stimulus used to test the response was an air blast in 45% of cases. Various scales were used to indicate the pain that was provoked and the severity of the sensitivity.

Prevalence Data

Prevalence ranged from 1.3% to 92.1%. A fixed-effect meta-analysis yielded a summary estimate of DH of 11.5%. A random-effects meta-analysis yielded a summary estimate of 33.5%. The predictive interval, which would apply to the results of a future study based on past experience, ranged from 4.8% to 62.3%.

Effect Modifiers

Factors were investigated for their effect on the prevalence reports. No significant differences in prevalence were found based on study decade, continents, funding sources, or nonresponse rates. In addition, the diagnostic method characteristics did not explain why the prevalence estimates varied so widely.

Factors found to be significant in their effect were the type of participants included, their age range, the recruitment strategy, and the number of study sites. A higher prevalence was found in specialty practice patients (mean prevalence 61.2%) and specific subgroups of the general population (mean 43.3%) compared to general practice patients (mean 30.3%). Studies limited to young adult patients (mean 43.9%) had a higher prevalence than those including other age groups (mean 32.1%). Recruitment using a consecutive sample (15.2%) had a lower prevalence compared to studies that recruited randomly (30.0%) or by convenience sampling (46.3%). Studies that involved multiple sites (27.6%) had a lower prevalence than those conducted at a single site (39.2%).

DISCUSSION

The fixed-effects summary prevalence of 11.5% can be interpreted as the "best estimate" or "best guess" for the preva-

Clinical Significance

Better reporting and better quality control when conducting studies are needed to improve the clinician's ability to acquire accurate prevalence data for DH. Understanding the burden of DH can assist in planning for the resources needed to reduce or prevent discomfort for patients.

lence in the absence of heterogeneity. The random-effects summary prevalence of 33.5% can be interpreted as the average prevalence from all studies. The predictive interval, which ranged from 4.8% to 62.3%, includes the possibility that a new study could see a prevalence of DH as low as 5% but also a possible prevalence much higher than the expected average of 33.5%.

Zeola LF, Soares PV, Cunha-Cruz J: Prevalence of dentin hypersensitivity: Systematic review and meta-analysis. *J Dent* 81:1-6, 2019

Reprints available from PV Soares, Dept of Operative Dentistry and Dental Materials, School of Dentistry, Federal Univ of Uberlândia. Uberlândia, Minas Gerais, 38400-902, Brazil; e-mail: paulovsoares@yahoo.com.br

IMPLANTS

Digital implant planning and guided implant surgery

Check for updates

BACKGROUND

As digital technologies have advanced, dental practitioners have recognized many areas where they can play a critical role. Implantology and implant prosthetics depend on having comprehensive diagnostic information and precise planning to achieve the desired outcome and meet the expectations of both the dentist and the patient. Using digital implant planning and guided implant surgery offers many advantages over conventional approaches. The workflow of digital implant planning and surgery and possible sources of error were considered.

DIGITAL IMPLANT PLANNING BASICS

The requirements for digital implant planning and guided surgery are 3-dimensional imaging of the anatomical structures and a precise diagnosis and prediction of potential problem areas so that the process can be tailored to the situation. The 3-dimensional radiographs includes digital imaging and communications in medicine (DICOM) data and standard tessellation language (STL) data based on an intraoral scan or a scan of a plaster cast. With this information, the procedure can be carefully planned but also modified at any time to accommodate a specific implant system or its software component. The acquisition of these data facilitates communication among the implant team members, which includes the patient, dentist, and dental technician. The visual presentation that can be achieved allows the patient to see the planned restoration and permits better communication about options and limitations.

WORKFLOW

The specific components of the digital workflow are the acquisition of basic data, data processing, design and fabrication of the surgical template, and the surgery itself.

Data Acquisition

All of the needed data can be acquired in a single visit. The STL data and DICOM data from the radiological images are superimposed on one another. DICOM is obtained by cone-beam computed tomography (CBCT) imaging or standard CTs. Field of view (FOV) must be carefully selected to obtain accurate data. The digital separation of significant structures on CBCT can be done either on an automatic or a manual setting.

Data Processing

The surgical template is generated from the STL surface data. Both it and the DICOM data are imported into the implant planning software and superimposed. Specific points are marked to align the data recorded. An incorrectly positioned implant can dramatically affect surrounding structures, so error analysis and correction are vital parts of the process.

The digital data obtained through direct production or a scanned wax-up are entered into the planning software or generated there. Implant position is aligned with the anatomical conditions or the process is reconsidered (Figures 2 and 3). When registration is successful, anatomical structures can be marked and protected. The inferior alveolar nerve is of particular concern, so the planning process should designate a safe distance of at least 1.5 mm for this nerve. Identifying bony undercuts can avoid complications.

Generally the planning software includes a database of common implants or can have their data uploaded. Based on the anatomic considerations and the characteristics of the planned restoration, a proper implant can be selected. At this point any need for augmentation procedures can be verified. If the surgeon did not personally do the implant planning, he or she should carefully