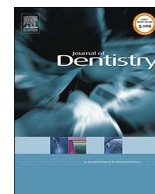




Contents lists available at ScienceDirect

Journal of Dentistry

journal homepage: www.elsevier.com/locate/jdent

Full length article

The relationship between dentine hypersensitivity, dietary acid intake and erosive tooth wear

Saoirse O'Toole^{a,*}, David Bartlett^b^a Department of Tissue Engineering and Biophotonics, King's College London Dental Institute, Floor 17 Tower Wing, Guy's Hospital, London, SE1 9RT, UK^b Department of Prosthodontics, King's College London Dental Institute, Floor 25, Tower Wing, Guy's Hospital London, SE19RT, UK

ARTICLE INFO

Keywords:

Dentine hypersensitivity
Diet
Toothbrushing
Tooth wear
Tooth abrasion
Epidemiology

ABSTRACT

Objectives: To assess the interplay between dietary acid intake, toothbrushing and erosive tooth wear as aetiological factors in self-reported DH

Materials and methods: This is a secondary analysis on previously collected data from 600 participants with (n = 300) and without (n = 300) severe erosive tooth wear. Participants recruited from restorative clinics of King's College London Dental Institute (REC Ref 14/EM/1171) were questioned on their self-reported DH, frequency and timing of dietary acid intake, habits associated with consumption of dietary acids and tooth brushing habits. Erosive tooth wear was assessed using Basic Erosive Wear Examination (BEWE). Differences in diet and brushing habits between those with self-reported DH and those without were analysed using descriptives and logistic regression in SPSS vers. 24.

Results: Of those reporting with DH (n = 272), a greater number spent ≥ 10 min eating fruit per sitting, (n = 46) and had a drinking habit such as sipping, swishing or holding drinks in the mouth (n = 72) compared to those without DH (n = 26 OR 2.72, 95%CI [1.32–5.61], p = 0.007 and n = 38 OR 2.33, 95%CI [1.40–3.88], p = 0.001, respectively). More DH participants used a soft toothbrush (n = 36) compared to those without DH (n = 18 OR 2.35, 95%CI [1.20–4.59], p = 0.013). No association was observed with frequency of daily toothbrushing or dietary acid intake.

Conclusion: Contact time between the tooth and the acid may be a more important risk factor for DH compared to frequency of dietary acid intake or frequency of toothbrushing. Other possible aetiological factors should be considered.

Clinicaltrials.gov number: NCT02449434

Clinical significance: Increased contact time with dietary acids and sipping swishing or holding drinks in the mouth prior to swallowing should be addressed as an aetiological factor in DH. Toothpaste abrasivity and toothbrush filament stiffness may play a greater role in DH compared to frequency of toothbrushing.

1. Introduction

Dentine hypersensitivity is a common, painful oral condition which has been characterised as an intense, transient pain resulting from exposed dentine, typically in response to chemical, thermal, tactile or osmotic stimuli [1]. Dentine tubules must be patent for dentine hypersensitivity to occur [2] and it has been observed in vitro that dietary acids can remove the smear layer exposing dentinal tubules [3]. Dietary acid intake has been associated with dentine hypersensitivity [1,4,5], with one clinical trial reporting a relationship between dietary acid intake in the previous hour and a positive response to clinical dentine hypersensitivity testing [6].

Dietary acids have also been associated with erosive tooth wear

[4,7]. It was recently observed in a case-control study on 600 participants, that patients presenting with dietary erosive tooth wear were more likely to present with self-reported dentine hypersensitivity (p < 0.001) [4]. However, a large proportion of those without wear (41.7%) also reported to have dentine hypersensitivity [4]. It is not understood what specific risk factors from the diet results in dentine hypersensitivity. It could be the behavioural characteristics related to dietary acid consumption or the diet itself.

Furthermore, there is a lack of clinical data on the relationship between brushing habits and dentine hypersensitivity. Brushing factors such as brushing force and different toothpastes have been observed to affect tubule patency in vitro [8–10]. However, the largest epidemiological study to date investigating dentine hypersensitivity on 3187

* Corresponding author.

E-mail address: Saoirse.otoole@kcl.ac.uk (S. O'Toole).

<http://dx.doi.org/10.1016/j.jdent.2017.10.002>

Received 13 September 2017; Received in revised form 2 October 2017; Accepted 4 October 2017
0300-5712/ © 2017 Published by Elsevier Ltd.

participants observed no relationship between brushing frequency, the type of toothbrush used (manual or electric) or brushing movement. No clear relationship was observed between dentine hypersensitivity and the timing of brushing in relationship to meals [1].

The aim of this analysis was to investigate the association between dentine hypersensitivity, dietary acid intake patterns and tooth brushing habits. The null hypothesis proposed that there will be no difference in dietary acid intake patterns and tooth brushing habits between those with self-reported dental hypersensitivity symptoms and those without.

2. Materials and methods

This study is based on secondary analysis of previously collected data, a full description of which is presented in O'Toole et al., 2017 [4]. Briefly, 600 adults aged 18 years or older (300 cases with severe erosive tooth wear and 300 controls frequency-matched by age) were recruited from restorative clinics of Guy's Hospital, King's College London Dental Institute (Research Ethics Committee Reference 14/WS/0015, Clinical Trials Identifier number NCT02449434) between the period May 2014 and March 2016. Participants had a minimum of 10 teeth in each jaw with no missing anterior teeth, anterior crowns, bridges, active caries or periodontal disease and were diagnosed by their treating practitioner as having moderate-severe erosive tooth wear or no-mild erosive tooth wear. Those with potential acid sources for intrinsic erosive wear, xerostomia bruxism, pregnancy, involvement in other research or inability to speak or understand in English were excluded. Erosive tooth wear cases were defined as those with a Basic Erosive Wear Examination (BEWE) score of 12 or higher and at least one score of 3 in a sextant (clinically classified as moderate to severe erosive tooth wear), whereas controls were defined as those with a BEWE score of 10 or lower and no score of 3 on any surface of any tooth (clinically classified as no or mild erosive tooth wear).

Once accepted, a trained interviewer questioned participants on tooth hypersensitivity, toothbrushing habits and acidic intake using an adapted version of a previously validated questionnaire [4]. Dentine hypersensitivity was measured with a single question (yes/no) and used as the outcome measure for this study. Toothbrushing habits referred to the daily frequency of brushing (once a day or less often, twice a day and 3 or more times a day) type of toothbrush used (powered, soft, medium and hard manual), use of desensitising toothpaste and brushing within 10 min of consuming something acidic. Dietary habits referred to daily frequency intake of acid fruits (apples, citrus, grapes, berries and any other fruit) and acidic drinks (carbonated drinks, fruit drinks, any other acidic drinks e.g. fruit teas, wine) with meals and between meals, the duration of each dietary acid intake (< 5, 5–10 and > 10 min), and any drinking habits prior to swallowing (such as sipping, swishing or holding the drink in the mouth). On average, questionnaires were completed between 5 and 10 min.

3. Statistical analysis

We first compared the proportion of patients with self-reported dentine hypersensitivity by demographic (gender and age), clinical (presence of erosive tooth wear) and behavioural characteristics (brushing habits and acidic intake) using the Chi-squared test. The crude and adjusted association between brushing habits and acidic intake with dentine hypersensitivity was assessed using binary logistic regression models using presence/absence of self-reported dentine hypersensitivity as the outcome variable. Odds ratios (OR) were thus reported as the measure of association. The adjusted model controlled for demographic, presence of erosive tooth wear and clinical factors. Significance was inferred at $p < 0.05$.

Table 1
Crude analysis of self-reported dentine hypersensitivity with demographics and tooth brushing habits.

Variable	No hypersensitivity n = 328 n (%)	Hypersensitivity n = 272 n (%)	p value
Outcome			< 0.001*
Severe erosive tooth wear	134 (40.9%)	166 (61.0%)	
Mild/Moderate erosive tooth wear	194 (59.1%)	106 (39.0%)	
Age			0.001*
18–25	30 (9.1%)	34 (12.5%)	
26–35	66 (20.1%)	68 (25.0%)	
36–45	71 (21.6%)	63 (23.2%)	
46–55	68 (20.7%)	64 (23.5%)	
56–65	53 (16.2%)	35 (12.9%)	
66+	40 (12.2%)	8 (2.9%)	
Gender			0.001*
Female	151 (46%)	162 (59.6%)	
Male	177 (54%)	110 (40.4%)	
Do they use a de-sensitising toothpaste?			< 0.001*
No	252 (76.8%)	97 (35.7%)	
Yes	76 (23.2%)	175 (64.3%)	
Type of toothbrush			0.012*
Soft manual tooth brush	18 (5.5%)	36 (13.2%)	
Medium manual tooth brush	144 (43.9%)	107 (39.3%)	
Hard manual tooth brush	21 (6.4%)	17 (6.3%)	
Electric tooth brush	145 (44.2%)	112 (41.2%)	
Time spent brushing teeth			0.258
> 2min	257 (78.4%)	224 (82.4%)	
< 2min	71 (21.6%)	48 (17.6%)	
Does the patient brush immediately after having something acidic?			0.158
No	253 (77.1%)	196 (72.1%)	
Yes	75 (22.9%)	76 (27.9%)	
Frequency of daily brushing			0.656
≤ 1 daily	49 (14.9%)	34 (47.7%)	
2/day	257 (78.4%)	221 (81.3%)	
3+ /day	22 (6.7%)	17 (6.3%)	

*Indicates significance.

4. Results

The mean age of participants was 44 (SD: 14, range: 18–83), with 313 (52.1%) women and 287 (47.9%) men. Two hundred and seventy-two participants (45.3%) self-reported as having dentine hypersensitivity. Dentine hypersensitivity was significantly more common among women, younger adults and those with severe erosive tooth wear (Table 1).

In terms of brushing habits (Table 1), a greater number of those reporting dentine hypersensitivity used a soft toothbrush (n = 36) compared to those without dentine hypersensitivity (n = 18; $p = 0.012$). There were no significant differences with daily frequency of brushing ($p = 0.656$), time spent brushing ($p = 0.258$) and whether the patient brushed within 10 min of consuming a dietary acid ($p = 0.158$).

As for dietary acid intake (Table 2), there was a positive trend in dentine hypersensitivity by intake of acidic drinks between meals. Dentine hypersensitivity was more common among participants consuming ≥ 3 dietary acids between meals daily than those without sensitivity (53% versus 47%, $p = 0.002$) and those that drank ≥ 2 acidic drinks between meals (54.9% versus 43.2%, $p < 0.001$). No differences were found in dentine hypersensitivity by daily intake of acidic drinks with meals ($p = 0.917$) and time spent during consumption of acidic drinks ($p = 0.619$). Dentine hypersensitivity was more common among participants with the habit of sipping, swishing or holding drinks in the mouth prior to swallowing (65.5%) than those

Download English Version:

<https://daneshyari.com/en/article/8699376>

Download Persian Version:

<https://daneshyari.com/article/8699376>

[Daneshyari.com](https://daneshyari.com)