A study investigating the possible relation between inter-subject variation in parameters of whole saliva, pellicle and differences in susceptibility to erosion

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To investigate a possible relation between saliva and pellicle parameters and susceptibility to erosive wear.

Ethical review	Approved WMO		
Status	Pending Other condition		Pending
Health condition type			
Study type	Observational non invasive		

Summary

ID

NL-OMON32183

Source ToetsingOnline

Brief title The relation between dental erosion and saliva/pellicle characteristics

Condition

• Other condition

Synonym dental erosion, wear

Health condition

tandweefsel

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Research involving

Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Groningen Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: dental erosion, hydroxyapatite, saliva

Outcome measures

Primary outcome

From all participants the saliva total protein concentration will be

determined. Also the loss of hydroxyapatite after an erosive challenge will be

measured.

The correlation between the total protein concentration of saliva and the

susceptibility to erosive wear will be calculated.

Secondary outcome

From all participants the saliva composition (proteins and minerals), saliva characteristics (pH, buffer capacity, viscosity) and pellicle composition (proteins) will be determined. The correlation between different saliva parameters and the susceptibility to erosive wear will be calculated.

Study description

Background summary

Erosive wear is the loss of enamel due to a chemical process without the involvement of bacteria. The main cause of erosive wear is the excessive consumption of acidic drinks. Recently there is an increasing interest for erosive wear in young people [Truin et al., 2004]. A wide variation between

individuals in susceptibility to developing erosion has been found [O*Sullivan and Curzon, 2000; Vieira et al, 2007]. Saliva and pellicle composition could be of importance in explaining this difference. The pellicle, a thin layer of salivary proteins adsorbed to the tooth surfaces, has an important function in the protection of the dental hard tissues. From the point of view of erosive wear it is interesting to know that it acts as a diffusion barrier to H+-ions and is protective against enamel erosion [Hannig and Balz, 1999; Lendenmann et al., 2000; Hannig et al., 2005]. Also, the composition (minerals, proteins), flow, buffercapacity, pH and viscosity of saliva could be of influence [Johansson et al., 2004; Dawes and Kubieniec, 2004; Tenovuo and Lagerlöf, 1994].

Study objective

To investigate a possible relation between saliva and pellicle parameters and susceptibility to erosive wear.

Study design

Design

It is a single centre, single blind study. Twelve healthy volunteers will participate in this study. Unstimulated and stimulated saliva will be collected in the morning (9.00). The volunteers will carry the discs in the buccal sulcus for 1.5 hours. This place is preferred because of the reduced chance of swallowing the samples. Eating, drinking, brushing and smoking is not allowed with the samples in situ. After 1.5h the samples are collected and are exposed for 2 minutes to an erosive solution (50 mM citric acid (pH = 3)).

Samples

Thirty hydroxyapatite discs (Himed medical applications Inc, Old Bethpage NY, USA) with a diameter of 8 mm and a thickness of 2 mm will be used. Hydroxyapatite is often used in in vitro studies and in in situ studies [Barbour et al., 2003; Joiner et al., 2003; Shellis and Wilson, 2004; Tanizawa et al., 2004; Vacca Smith and Bowen, 2000a; Vacca Smith and Bowen, 2000b]. The advantage of hydroxyapatite is that it is much more homogenous in structure and composition than to human enamel [Barbour et al., 2005]..

Wear measurements

The loss of calcium from the hydroxyapatite after an erosive challenge is measured using Atomic Absorpion Spectroscopy (AAS). First, baseline measurements of the eroding solution will be performed. After exposing the samples to the eroding solution the calcium concentration of the solution is measured again. The differences in calcium concentration are an indication of the loss of hydroxyapatite [Dijkman et al., 1983; Vieira et al., 2005].

Saliva measurements

The pH, buffercapacity, total protein concentration and the viscosity of the saliva will be determined. Also the potassium, sodium, chloride, urea, fluoride and bicarbonate concentration will be measured [Veerman et al., 1996].

Pellicle measurements Protein composition of the pellicle is measured using SDS-PAGE (gel-electrophoresis).

Study burden and risks

The burden for the participants is to carry 2 samples in the buccal sulcus for 1.5 hour and to hand over saliva. Swallowing of the samples is a possible risk. By placing the samples in the buccal sulcus this risk is reduced. If swallowing of the samples occurs this will not give a big problem because of the surface characteristics of the samples. There is no direct health benefit for the participants.

Contacts

Public Universitair Medisch Centrum Groningen

Antonius Deusinglaan 1 9711 XB Groningen Nederland **Scientific** Universitair Medisch Centrum Groningen

Antonius Deusinglaan 1 9711 XB Groningen Nederland

Trial sites

Listed location countries

Netherlands

Eligibility criteria

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Age Adults (18-64 years) Elderly (65 years and older)

Inclusion criteria

Adults with an ASA score of 1 with a rehabilited dentition

Exclusion criteria

An ASA score of 2 or higher, severe periodontal disease (Dutch periodontal screening index, DPSI > 2) and an unrehabilitated dentition

Study design

Design

Study type:	Observational non invasive	
Intervention model:	Other	
Allocation:	Non-randomized controlled trial	
Masking:	Open (masking not used)	
Control:	Active	
Primary purpose:	Basic science	

Recruitment

NL	
Recruitment status:	Pending
Start date (anticipated):	01-06-2008
Enrollment:	50
Туре:	Anticipated

Ethics review

Approved WMO Application type:

First submission

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

 Register
 ID

 CCMO
 NL22844.042.08