

Holistic approach to investigate dental caries in diabetes patients

Submission date 13/09/2019	Recruitment status No longer recruiting	<input checked="" type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 23/09/2019	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 26/09/2019	Condition category Oral Health	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims:

Diabetes mellitus affects almost 4 million people in the UK, and by 2025, it is estimated that 5 million people will have diabetes. Diabetes can cause oral health problems including dry mouth, tooth decay, gum problems, tongue sores and mouth ulcers. This study aims to investigate factors that might promote or reduce dental decay in patients with or without type 2 diabetes, including oral hygiene behaviour, saliva properties, bacteria found in the mouth, blood glucose levels and vitamin D levels.

Who can participate?

Non-diabetic adults and adults with type 2 diabetes

What does the study involve?

Participants will fill in a questionnaire on their lifestyle and how they look after their teeth. They will also provide a saliva (spit) sample. A dentist will examine their teeth, including taking X-rays if needed, and will take a sample of dental plaque. A nurse will take a blood sample. All participants will receive instruction on oral hygiene along with a free toothbrush and toothpaste.

What are the possible benefits and risks of participating?

Participants will benefit from an examination of their saliva and teeth conditions. They will also be able to verify their blood glucose, vitamin D level and if they are suffering from hyposalivation (reduced saliva, leading to a dry mouth). Teeth will be examined for tooth decay. In addition, the participants will be assessed on their risk of developing new decay. Finally, oral hygiene (cleaning the teeth and mouth) instructions with a free toothpaste and toothbrush will be provided.

Where is the study run from?

Bart's Health NHS Trust hospitals, Royal London Hospital (UK)

When is the study starting and how long is it expected to run for?

July 2018 to September 2019

Who is funding the study?

This study is part of a PhD study which is fully funded by the Saudi Arabia Cultural Bureau in Britain (SACB). Part of the funding was awarded for this clinical project by the Novo Nordisk UK Research Foundation.

Who is the main contact?

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Contact information

Type(s)

Scientific

Contact name

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Additional identifiers

EudraCT/CTIS number

Nil known

IRAS number

ClinicalTrials.gov number

Nil known

Secondary identifying numbers

Nil known

Study information

Scientific Title

Holistic approach to investigate protective and risk factors for dental caries in patients with or without diabetes type 2

Study objectives

Primary outcome: The extent of dental caries in participants either with diabetes type 2 or without diabetes type 2.

Holistic investigation of most potential protective and risk factors of dental caries among individuals with diabetes type 2 by the employment of clinical, salivary, Vitamin D, blood and microbial (dental plaque) analyses.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Not provided at time of registration

Study design

Observational case-control study

Primary study design

Observational

Secondary study design

Case-control study

Study setting(s)

Hospital

Study type(s)

Screening

Participant information sheet

Not available in web format, please use contact details to request a participant information sheet.

Health condition(s) or problem(s) studied

Dental caries

Interventions

All the following assessments will be carried out:

1. Medical and dental history
2. Questionnaire of relevant protective and risk factors for dental caries
3. Unstimulated Whole Saliva tests (USWS) to measure flow rate, pH, buffer capacity and Spinnbarkeit
4. Stimulated whole saliva sample collecting for later saliva physical and chemical analyses (salivary osmolality, total proteins, total antioxidant capacity, nitrate oxide and saliva electrolytes (calcium, phosphate, sodium, potassium, fluoride and zinc)
5. A blood sample will be obtained by a registered nurse to do a glycated haemoglobin test (HbA1c) to measure glucose control and Vitamin D level
6. Dental plaque scoring
7. Supragingival plaque sample collecting for later analyses or total bacterial load, Streptococcus mutans count and Lactobacillus count

A further assessment will follow supragingival and subgingival debridement (if required) using ultrasonic scaler with polishing using the prophylaxis paste (NUPRO DENTSPLY, Germany).

8. Dental caries (coronal and root) examination via ICDAS-II index and root severity index

9. Dental caries detection using laser fluorescence evaluator (SoproLife ®, Acteon, La Ciotat, France)
10. Dental caries risk assessment by CAMBRA model
11. Oral hygiene instructions with a free toothpaste and toothbrush

Intervention Type

Other

Primary outcome measure

Extent of dental caries assessed using the International Caries Detection and Assessment System (ICDAS) and severity index during the assessment process.

Secondary outcome measures

1. Dental caries risk levels measured using Caries Management by Risk Assessment (CAMBRA) during the examination stage
2. Streptococcus mutans, Lactobacillus bacteria and total bacterial load in supragingival plaque measured using a real-time PCR assay
3. Unstimulated saliva flow rate measured using saliva weight
4. Saliva pH and buffer capacity using the saliva-check buffer testing mat kit
5. Saliva Spinnbarkeit (fibrosity) measured using the NevaMeter device
6. Stimulated whole saliva, total proteins, total antioxidant capacity and nitrate oxide measured using assay kit where the reaction is measured by spectrophotometer
7. Saliva electrolytes measured using Ion Selective Electrode (ISE) and Inductively Coupled Plasma Optical Emission Spectroscopy (ICP-OES)
8. Blood HbA1c and vitamin D levels measured using specific assay kits

Overall study start date

09/07/2018

Completion date

11/09/2022

Eligibility

Key inclusion criteria

1. Participants who are male or female ≥ 18 years of age
2. For the test group, they have been diagnosed with type 2 diabetes
3. For the control group, participants who are not diagnosed with type 2 diabetes
4. Participants having minimum one natural tooth
5. Capable of giving informed consent
6. Ability to understand and speak English
7. Able and willing to comply with all trial requirements
8. Not participating in another dental trial
9. Not diagnosed with cognitive defect due to mental illness, depression, Alzheimer's disease, or dementia
10. No antibiotic, no steroidal and/or non-steroidal anti-inflammatory medication used during the last 3 weeks
11. Not pregnant or breastfeeding
12. Not in another dental study testing different dental products during the previous 3 months and during the study period
13. Not currently taking Vitamin D supplements

Participant type(s)

Patient

Age group

Adult

Lower age limit

18 Years

Sex

Both

Target number of participants

182

Key exclusion criteria

1. Participants who are edentulous
2. Cognitive defect due to mental illness, depression, Alzheimer's disease, or dementia
3. The presence of any hard or soft tissue tumours in the oral cavity
4. Patients undergoing chemo and/or radiation therapy
5. Any other significant disease or disorder which, in the opinion of the Investigator, may either put the participants at risk because of participation in the trial, or may influence the result of the trial, or the participant's ability to participate in the trial
6. Any condition, which in the opinion of the investigator, would preclude participation by the subject (such as cross-infection control risk)
7. Participants who are prescribed long-term systemic antibiotics
8. Participants who are pregnant or breastfeeding
9. Participations who are in another dental study testing different dental products during the previous three months and during the study period
10. Participants who had additional fluoride treatment in the past 6/3 months
11. Participants who are prescribed to use high fluoridated toothpaste
12. Participants who are currently taking Vitamin D supplements

Date of first enrolment

16/12/2019

Date of final enrolment

11/04/2022

Locations**Countries of recruitment**

England

United Kingdom

Study participating centre

Barts Health NHS Trust/The Royal London Dental Hospital
The Royal London Hospital
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Sponsor information

Organisation

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Sponsor type

University/education

ROR

<https://ror.org/026zzn846>

Funder(s)

Funder type

Research organisation

Funder Name

Novo Nordisk UK Research Foundation

Alternative Name(s)

The Novo Nordisk UK Research Foundation, ovo Nordisk Research Foundation UK, NNUKRF

Funding Body Type

Private sector organisation

Funding Body Subtype

Trusts, charities, foundations (both public and private)

Location

United Kingdom

Funder Name

Saudi Arabia Cultural Bureau in London

Alternative Name(s)

Royal Embassy of Saudi Arabia Cultural Bureau in London, Royal Embassy of Saudi Arabia - Cultural Bureau in London, Royal Embassy of Saudi Arabia Cultural Bureau, SACB

Funding Body Type

Private sector organisation

Funding Body Subtype

Other non-profit organizations

Location

United Kingdom

Results and Publications

Publication and dissemination plan

The data from this study will be analysed and the results will be published in a timely manner. The main output will be researcher papers in a scientific journal as well as being presented at scientific meetings.

Intention to publish date

01/06/2022

Individual participant data (IPD) sharing plan

The datasets generated and/or analysed during the current study during this study will be included in the subsequent results publication.

IPD sharing plan summary

Other