Early Career Researchers Day Conference 2025

Abstracts

3-Minute Oral Presentation Prize

Clinical Abstracts

Authors:

Samantha Watt, Zoe Marsh – University of Sheffield

Title:

Involving children in designing oral health research about Sugar Sweetened Beverages

Abstract:

Background: The consumption of sugar sweetened beverages (SSBs) in children and young people (CYP) has increased rapidly over recent years. Regular consumption of SSBs can cause dental caries and erosion and contributes to the development of obesity. The NIHR funded BRIGHT trial found 55.1% of participants aged 11 to 14 years in secondary schools in deprived areas drank SSBs every day and 25.6% drank energy or sports drinks daily, highlighting it as topic of importance for oral health research. However, surprisingly little oral health research has been conducted in this field and patient public involvement and engagement (PPIE) work is first needed.

Aim: To undertake PPIE with CYP representatives from the BRIGHT trial to inform the design of future research projects.

Methods: PPIE groups were held with thirty young people aged 10-17 years to discuss research ideas about SSBs and oral health. Inclusive participatory activities appropriate for the CYP attending this group were used, including an oral health quiz, sharing of personal stories and drawing exercises, this was found to be particularly beneficial for neurodivergent contributors.

Results: SSBs were described by the PPIE representatives as the most popular drinks for CYP. Those young people who drank SSBs, described doing so for reasons of taste, but also to give them energy, to wake them up and interestingly, to help them sleep. It was highlighted that CYP are regularly exposed to content and advertisements on social media regarding SSBs.

Conclusion: This work suggested that SSBs, in particular sports and energy drinks, may be consumed by CYP to comply with social norms and due to the influence of social media which may be under the radar parents and dental teams. PPIE has indicated the impact of SSBs on oral health to be a priority from the perspective of CYP. Oral health research with CYP is need to co-design appropriate interventions to reduce their consumption of SSBs and tackle this worrying trend.

Authors:

James Coughlan, Wendy Thompson – University of Manchester

Title:

Forecasting demand for unplanned dental care: an evaluation of machine learning models

Abstract:

It is estimated that approximately 60% of people access dental care routinely in England, while the remaining 40% only attend when they experience a dental issue. However, those who attend irregularly may struggle to book an appointment directly through a practice due to high demand and low numbers of NHS dentists. These patients can seek emergency dental care through NHS 111, which can recommend patients to attend local urgent dental care facilities.

These services are, however, costly to deliver and must be commissioned in advance. Because demand for these services is unknown, commissioners must attempt to ensure they are commissioning sufficient care to meet population oral health needs, while making efficient use of scarce resources. Forecasting demand for these services can provide data driven estimates of need to guide commissioners and policy makers in their decision making.

In this study we use NHS call data to create a forecasting model for emergency dental service demand. Our primary dataset is the Integrated Urgent Care Aggregate Data Collection, which includes data on calls which are recommended to attend dental services.

We train and test several machine-learning models, including autoregressive models, supervised learning and non-linear models such as gradient boosting and random forest algorithms. We tune the model hyperparameters and evaluate the models using rolling origin cross validation, comparing the root mean square error (RMSE) and mean average prediction error (MAE) of each model.

Our results show that demand for dental services has risen substantially and consistently since the onset of COVID, and has yet to return to pre-Covid levels, with an average of 88,763 monthly calls in 2023/2024. Demand is highest in Midlands and North East regions, and in spring. We find that the ridge regression forecasting model performs best with the lowest RMSE and MAE, followed by autoregression and random forest algorithm, although they each have a mean average percentage error of approximately 11%.

In conclusion, forecasting demand using call data alone provides a fair but imprecise forecast of demand for unplanned dental care through 111, and further research should seek to obtain and incorporate more variables to improve prediction accuracy.

Authors:

Ryan O'Donnell, Richard Holliday, Nick Jakubovics, Ellie Benfield – Newcastle University

Title:

Methods used to deliver adjunctive probiotic treatment during the non-surgical management of periodontitis: a scoping review.

Abstract:

Objective:

To identify which methods have been used to deliver adjunctive probiotics during the non-surgical management of periodontitis in clinical trials. This review also investigates which probiotics have been used and at what dose, along with the periodontal treatment outcomes achieved.

Introduction:

Periodontitis is a multifactorial disease with the primary risk factor being dental plaque biofilms. Surgical and non-surgical treatments are available, alongside these treatments adjunctive probiotics have been used as an attempt to improve treatment outcomes.

Inclusion criteria:

Clinical trials investigating the use of probiotics as an adjunctive treatment to non-surgical periodontal therapy in humans.

Methods:

Conducted in accordance with the Joanna Briggs Institute methodology for scoping reviews. MEDLINE, Embase, Web of Science, and Scopus were searched on 02/02/2024 from inception with no date limits applied.

Results:

Out of 4769 studies 66 met the inclusion criteria. Over 30 different probiotics were identified along with 18 different delivery methods with varying dosages and duration. 48 of the included studies reported a beneficial effect when a probiotic was used, 14 reported no difference, 3 found the outcomes comparable to the use of antibiotics, and 1 study reported a better outcome from the control group.

Conclusions:

The probiotic used, its dosage, delivery method, duration of application, and outcome measures differ across studies making it difficult to draw conclusions on their efficacy. This scoping review highlights the need for further research to establish a uniform treatment protocol and to identify the most effective probiotic bacteria.

Clinical Significance:

Despite the majority of included studies indicating a potential benefit from the use of probiotics during the non-surgical management of periodontitis, the high level of heterogeneity between interventions they currently cannot be recommended for use in clinical practice.

Authors:

Amin Vahdati, Gita Khadivi, Zahra Ghorbani, Ehsan Vahdati Helan, Anahita Ranjbar, Somayyeh Azimi – University of Manchester

Title:

Accessibility of Special Care Dentistry Across Countries: A Scoping Review

Abstract:

Introduction: People with special care needs often face significant barriers in accessing dental care due to physical and cognitive limitations, leading to high rates of dental issues like caries. Despite the growing recognition of these challenges, unmet dental care needs remain prevalent. This review aims to explore the global landscape of special care dentistry to identify gaps and opportunities for improving dental services for this population. Methodology: A systematic search was conducted across three online databases—PubMed, Embase, and Scopus—to identify relevant articles from their inception through May 2024. Reference lists of the selected studies were also screened for additional sources. A thematic synthesis approach was applied to derive both descriptive and analytical themes. The scoping review was guided by the Arksey and O'Malley framework to examine the scope and nature of studies and documents related to dental care for individuals with special care needs. Furthermore, a Google search was performed to include accessible theses and official government documents from various countries. Results: A total of 49 studies from 11 countries were reviewed, all centred on providing dental care for people with special needs. The analysis revealed three main themes: Human resources, care delivery model, and management. Within these, nine subthemes emerged: Mid-level oral care providers, dentists, special care dentistry as a specialty, tele-dentistry, mobile dentistry, hospital care, levels of healthcare provision, financial support, and education. These themes and subthemes highlight essential areas for enhancing services for those people. Conclusions: A holistic approach is essential to enhance dental care for people with special needs (PWSNS). Critical strategies, including the involvement of mid-level oral care providers, the adoption of tele-dentistry and mobile units, and the availability of hospital-based services for complex cases, are crucial. To truly transform care for those people, each country must adapt these strategies to its specific context, aligning resources and policies to create an inclusive, accessible, and effective system.

Authors:

Anna Beaven, Zoe Marshman – University of Sheffield

Title:

Identifying unexplored dimensions of access to dental services for people aged 65 and older in the UK: a scoping review

Abstract:

Background: Maintaining good oral health is a key component to healthy ageing. With growing issues surrounding access to NHS dental services and an ageing population, there are concerns surrounding the impact of the access crisis on older people. The aim of this scoping review was to identify the research gaps surrounding access to dental services for people aged 65 years and over (65+) in the UK.

Methods: The databases CINAHL, Web of Science and PsycInfo were systematically searched from 1973-2003 using pre-defined inclusion and exclusion criteria with librarian support. Research gaps were identified by reviewing the overall spread and range of selected studies, extracting the key barriers and facilitators to accessing dental services, and making additional notes from this extraction. Ethical approval was not required for this study.

Results: 27 full-text articles identifying barriers and facilitators to accessing oral care for those aged 65+ were screened. Underrepresented populations included: community-dwelling older adults, those aged 85+, ethnic minorities living outside of London, gender minorities, and those living in the devolved nations. Unexplored themes relating to access to dental services included: ageism in the dental workforce, cultural hostility of healthcare services, negative media attention, lack of dental health education, dental tourism, skill mix, and increased dental workforce orientation towards privatised, cosmetic dentistry.

Discussion: This scoping review highlighted several gaps in the research both relating to underrepresented cohorts of the population and broader themes surrounding changes to modern-day dentistry which have not yet been studied using conventional theoretical models of access to healthcare services. As a result, research typically focuses on already well-known barriers which have not significantly changed over the last 50 years. There is a need for research to be multidisciplinary, incorporating sociological and psychological principles, to address the unexplored complexities relating to access. The main limitations of the study were that grey literature was not included; poorly indexed articles may have been missed.

Conclusion: To promote access to dental services for those aged 65+, the gaps identified in the literature must be addressed. This would enable commissioners to design appropriate evidence-based dental services for this population, to promote healthy ageing.

3-Minute Oral Presentation Prize

Basic Science Abstracts

Authors:

Saba Qureshi, Julien Gautrot, Thomas Iskratch – Queen Mary University of London

Title:

A Periodontal Ligament-on-Chip Model: Development of the Enthesis in a Biomechanical 3D Model

Abstract:

Orthodontic tooth movement (OTM) is regulated by the dynamic remodelling capacity of the periodontal ligament (PDL), a specialized tissue that responds to biomechanical cues. It is composed of various components that develop from a common progenitor cell source, with these cells interacting and responding to physical, chemical, and biomechanical stimuli, ultimately differentiating into the various regions of the ligament. To gain a deeper understanding of the interaction between biomechanical forces and the cellular and extracellular components of the PDL during both development and OTM, a biomechanical organ-on-chip (OOC) model was designed.

This model integrates UV-printable silicone and hydroxyapatite (HA) inks with 3D printing techniques to create a three-dimensional niche that closely mimics the in vivo PDL environment. Human mesenchymal stem cells (hMSCs) were directed along the tenoligamentous differentiation pathway through the application of bone morphogenetic protein-12 (BMP-12) and mechanical stimulation (stretching of the microtissue formed), aiming to recapitulate some of the cues regulating the development of the PDL interface. Additionally, macromolecular crowders (MMC) were used to promote extracellular matrix (ECM) assembly. Furthermore, to demonstrate the applicability of this model for the evaluation of novel biomaterials in vitro, HA microposts around which the tissues assembled were modified with a biomimetic with sulphonated coating, promoting the localized capture of recombinant bone morphogenetic protein-2 (rBMP-2).

Our results revealed that BMP-12 was essential for the development of tenoligamentous tissue constructs, while MMC accelerated ECM deposition and assembly. Mechanical stretch was found to significantly promote the tenoligamentous phenotype and ECM production. The formation of a hard/soft tissue interface, characterized by ECM deposition and cellular alignment, highlighted the critical role of hydroxyapatite as a biomimetic material for interface development. This conclusion was further supported by tissue failure at the interface when sulphonated HA was used and the positive impact that localized rBMP-2 delivery had to restore tissue integration whilst stimulating surrounding tissue development. This indicates the potent contribution of BMP-2, independent of mechanical stretch, for the promotion of tissue bonding and the regulation of cell phenotype.

This highly reproducible PDL-on-chip model serves as a powerful in vitro tool for studying the biomechanical and biochemical interactions that govern PDL development. It also offers valuable insights into the mechanisms underlying OTM. With its capacity for rapid data throughput and reproducibility, this model presents a sophisticated platform for advancing the understanding of hard/soft tissue interfaces and their responses to orthodontic interventions at the molecular level.

Authors:

Salem RM, McLean W, Chou L – University of Glasgow

Title:

Magnesium Chloride vs. Magnesium Oxide: A Comparative Study of Their Dentinogenic Effects on Human Dental Pulp Cells"

Abstract:

BACKGROUND: Magnesium-based biomaterials might provide an innovative therapeutic potential to substantially enhance regeneration of dental tissues. Magnesium (Mg2+) has been considered for its potential ability to accelerate proliferation and differentiation of human osteoblasts. However, to date, the dentinogenic effect of magnesium chloride (MgCl2) and magnesium oxide (MgO) on human dental pulp cells (HDPCs) has not been investigated. PURPOSE: This study was designed to compare the stimulatory effect of different concentrations of MgCl2 and MgO on dentinogenesis of HDPCs and to explore associated cellular signaling pathways. METHODS: HDPCs were cultured with 0.5mM,1mM, 2mM, 4mM, 8mM concentrations of supplemental MgCl2 and MgO, 0 mM as negative control group, lignin sulfonic acid sodium salt and xanthan gum as vehicle control groups. Crystal violet staining was used to determine cell attachment and proliferation rate. Cell viability was investigated by MTT assay. Odontogenic differentiation was assessed by evaluating alkaline phosphatase (ALP) activity, expression of dentin sialoprotein (DSP), dentin matrix protein1(DMP-1), dentin sialophosphoprotein (DSPP), type I collagen (COL-I), and mineralization. Expression of bone morphogenic protein (BMP-2), phosphorylated SMADs 1/5/9, p-p38, p38, p-JNK, JNK, p-ERK1/2, ERK1/2 mitogen activated protein kinase (MAPK) were also investigated. Statistical analysis was applied using multi-way ANOVA with Wilks' lambda test. RESULTS: 0.5mM-2mM MgCl2 elicited the highest stimulatory effect on attachment, proliferation rate, ALP activity, expression of dentinogenic proteins (DSP, DMP-1, DSPP, COL-I), expression of cellular signaling proteins (BMP-2, phosphorylated SMADs1/5/9, p-p38, p-JNK) mineralization, and down regulation of p-ERK 1/2 compared to negative control ($P< 0.0001$). 0.5mM supplemental MgO showed higher attachment, proliferation, cell viability, ALP activity, expression of dentinogenic proteins (DSP, DMP-1, DSPP, COL-I), cellular signaling proteins (BMP-2, phosphorylated SMADs1/5/9) and mineralization, compared to negative control ($P<0.001$). CONCLUSION: This study demonstrated the significant benefit imparted by optimum concentrations of MgCl2 and MgO on HDPCs evidenced by upregulated cell attachment, proliferation, cell viability, ALP activity, mineralization, expression of odontogenic proteins and cellular signaling proteins. Compared with MgO, MgCl2 yielded a wider range of effective concentrations (0.5mM-2mM MgCl2 vs. 0.5mM MgO) for upregulating the dentinogenic effect of HDPCs. MgCl2 at optimal concentrations could be a potential novel material for dentin repair in regenerative endodontics.

Authors:

Sian Crow, Prof. Simon Whawell, Dr Vehid Salih, Dr Andrew Foey – University of Plymouth

Title:

Oral Cancer Cell Lines Modulate Anti-Tumoural Response of M1 like Macrophages.

Abstract:

Background & aim: Oral Squamous Cell Carcinoma (OSCC) remains associated with a poor prognosis and is characterised by a high density of anti-inflammatory, pro-tumoral macrophages (M2) within the tumour microenvironment, linked to immune suppression, tumour-progression, and metastasis. Alternatively, pro-inflammatory M1-like macrophages, that exhibit anti-tumour effects, respond to environmental changes such as the presence of infection, and tumour-derived signals. The latter can drive the repolarisation of M1 macrophages to M2, which in turn promotes tumourigenesis. The aim of the study was to investigate the effect of OSCC cell conditioned medium on the response of M1 macrophages. Then if these responses also were observed in a co-culture system.

Methods: THP-1 pro-monocytes were differentiated to a distinct macrophage subset and used as a model of tumour associated macrophages exhibiting anti-tumoural effects. These macrophages were pre-stimulated with conditioned medium from OSCC cells, to mimic tumour environmental signals. The macrophages were then stimulated with lipopolysaccharide (LPS) from either the oral pathogen P.gingivalis or E.coli. Then macrophages and OSCC cell lines were co-cultured and stimulated with LPS. The resulting supernatant was assayed using sandwich ELISAs to measure the response of secreted cytokines (TNFα (Tumour Necrosis Factor Alpha) and (Interleukin) IL-6) to the tumour environmental signals.

Results & conclusion: Macrophage secreted TNFα levels were reduced up to 50% and IL-6 was upregulated by up to 50% in response to the conditioned medium when compared with control. This effect was also observed in a co-culture between macrophages and OSCC cells. Thus, tumour environmental signals from oral squamous cell carcinoma cell lines and direct cell-cell contact between macrophages and OSCC cell lines may supress the pro-inflammatory cytokines that are released from macrophages, producing a pro-tumoural environment.

Authors:

Hasan Mohiladeen, Ilida Ortega Asencio, Christopher W. Stokes, Duncan Wood – University of Sheffield

Title:

Development of Multi-Texture 3D-Printed Tooth Models for Enhancing and Assessing the Educational Impact on Teaching Clinical Skills in Restorative Dentistry.

Abstract:

The implementation of 3D printing technology has significantly advanced the field of dentistry by enabling the precise fabrication of artificial teeth, implants, and prosthetics. Despite these advancements, a persistent challenge in dental education is the lack of anatomically and mechanically accurate tooth models for teaching clinical skills, such as crown preparation. Current models fail to replicate the structural complexity and mechanical characteristics of natural teeth, particularly the distinct layers of enamel, dentine, and pulp. Consequently, students may struggle to accurately differentiate between dental tissues during preclinical training, limiting the development of essential restorative techniques.

This research aims to develop a multi-layered 3D-printed tooth model capable of replicating the structural and mechanical properties of enamel and dentine, thereby enhancing the pedagogical value of restorative dentistry training. To achieve this, Formlabs SLA, Phrozen DLP, and Stratasys J5 3D printing technologies were employed to fabricate experimental tooth models using 11 commercially available resins. These resins were systematically characterized to identify materials with mechanical properties comparable to natural teeth. Disc-shaped samples (30 mm diameter, 2 mm thickness) were produced and evaluated for Vickers and Mohs hardness, while surface morphology was analyzed using Scanning Electron Microscopy (SEM) and profilometry techniques.

The resulting 3D-printed tooth models, designed with distinct structural layering and mechanical properties, will be assessed through practical dental exercises involving student participants. The educational efficacy of the models will be evaluated using structured questionnaires measuring usability, anatomical realism, and comparability to natural teeth. By addressing the limitations of conventional dental models, this study aims to contribute to the advancement of restorative dentistry education through the development of more accurate and effective teaching tools.

Authors:

Tomas Nicholas, Katie Muddiman, Paul Kellet, Raul Bescos, Zoe Brookes – University of Plymouth

Title:

Cigarette smoke diminishes the nitrate-reducing activity of Rothia spp. in vitro

Abstract:

Objectives: Several Rothia species are well known nitrate-reducing bacteria which can contribute to the maintenance of both oral and systemic health. Smoking can alter the oral microbiome composition, but it is unclear how smoking impacts Rothia species and their ability to reduce nitrate into nitrite. This study therefore aimed to assess how cigarette smoke impacts the nitrate reducing activity of four Rothia spp. in vitro

Methods: R. aeria, R. mucilaginosa, R. kristinae and R. dentocariosa were grown in tryptic soy broth (TSB) (n=3) and cigarette smoke infused TSB (S-TSB) (n=6) for 24 hours at 37°C with 5% CO2 (R. kristinae was grown without 5% CO2). Following this, each sample was transferred into either TSB or fresh S-TSB, to an optical density of 0.01, in duplicate. This grouped samples into TSB/TSB, S-TSB/TSB and S-TSB/S-TSB for each species. Sodium nitrate was added to each sample to a concentration of 6.5mM, and incubated for 7 hours under the same conditions. Following this, nitrite levels of each sample were analysed using a high-performance liquid chromatography device (EICOM ENO-30).

Results: A significant difference among the groups was observed ($p=0.0046$). The nitrite concentration in the S-TSB/S-TSB samples were significantly lower compared to the TSB/TSB samples ($p=0.014$), with R. kristinae showing the largest percentage decrease in nitrite concentration (-97.8%) and R. dentocariosa showing the smallest (-95.0%). The S-TSB/TSB group exhibited a trend toward lower nitrite concentrations, but this was not statistically significant ($p=0.47$), with R. mucilaginosa showing the largest percentage decrease (-95.7%) and R. dentocariosa the smallest (-47.2%).

Conclusions: Our data suggest that exposure to cigarette smoke components reduce the nitrate reducing activity in the selected Rothia species. This may have implications in vivo on oral nitrate reduction, and consequently oral and systemic health, though more research is needed here.

Poster Abstracts

Poster Number: 1

Authors:

Gelareh Haghi Ashtiani, Nicola Innes, Waraf Al-Yaseen – Cardiff University

Title:

Training and Calibration of Assessors for Dental Photographic and Clinical Assessment in the Picture-Perfect Project

Abstract:

Objective: The Picture-Perfect study explores the use of intra-oral photographs taken by parents for remote dental screening in children, assessing their accuracy, feasibility, and acceptability. Although ICDAS II training is extensively covered in literature, there is a gap in comprehensive documentation of calibration standards, with studies reporting varying levels of inter-examiner agreement. We wanted to develop a rigorous training and calibration framework to enhance consistency and reliability among assessors evaluating both photographic and clinical assessments. As part of the study, training and calibration were conducted for dental professionals. This report outlines the process, highlighting challenges and strategies to overcome them. The aim was to achieve a high level of agreement between assessors, enabling them to score patients' teeth from photographs and clinical examinations using ICDAS II for caries and restorations.

Methods: Two dental professionals underwent an initial ICDAS II training session, which included theoretical instruction on standardised scoring for caries and restorations, followed by exercises using intra-oral photographs. Iterative calibration sessions were carried out, with assessors scoring 15 images and discussing discrepancies to ensure consistency. Re-scoring and feedback facilitated alignment of assessments. Inter- and intra-examiner reliability were assessed using weighted kappa statistics. Parallel clinical training involved scoring caries and restorations directly on patients. Clinical calibration followed a similar iterative approach, with assessors scoring clinical examinations and discussing discrepancies, with reliability analysed using weighted kappa statistics.

Results : For photographic assessments, intra-examiner reliability showed “near perfect agreement” (kappa > 0.93). Inter-examiner reliability demonstrated “substantial agreement” (kappa > 0.71), confirming strong concordance among the two assessors. For clinical assessments, inter-examiner reliability showed “near perfect agreement” (kappa > 0.92), supporting the effectiveness of the training and calibration process. Key areas of disagreement included differentiating early carious lesions and distinguishing between stages of enamel involvement.

Conclusion: The calibration process effectively standardised the assessment of intra-oral photographs and clinical evaluations, ensuring reliable and accurate assessments. High kappa values for both intra- and inter-examiner reliability underscore the robustness of the calibration procedures, with a focus on resolving areas of disagreement, supporting the Picture-Perfect study’s objectives.

Keywords: Calibration, Dental Photography, Caries Detection, Restoration Evaluation, ICDAS II, Kappa Statistics.

Poster Number: 2

Authors:

Miss Laura Timms, Prof Helen Rodd, Prof Paul Brocklehurst, Prof Chris Deery, Prof Zoe Marshman – University of Sheffield

Title:

Silver diamine fluoride for the management of dental caries in children in primary dental care: A feasibility study to determine whether a randomised controlled trial of silver diamine fluoride compared to usual care for the management of caries in children's primary teeth is feasible in UK primary dental care.

Abstract:

Background and aim

Silver diamine fluoride (SDF) treatment offers a non-invasive approach for arresting caries progression but its use in NHS primary dental care is limited. Furthermore, the clinical- and cost-effectiveness of SDF has not been compared to usual care in this setting. This study aimed to determine whether a randomised controlled trial (RCT) was feasible.

Methods

This was an individually randomised mixed-methods feasibility study comparing SDF to usual care in NHS primary dental care with an embedded process evaluation exploring SDF implementation. Children aged one- to eight-years, with caries in their primary dentition, were followed up for six to twelve-months. The following aspects were assessed: child and dental professional recruitment and retention; randomisation; suitability of outcome measures; protocol adherence; research acceptability and implementation. Interviews with families, dental professionals and national/regional stakeholders utilised the Consolidated Framework of Implementation Research (CFIR).

Results

Eight sites recruited 54 children. The recruitment rate from those eligible was 94%, with the majority retained (74%). Candidate outcome measures were well completed, except for ICDAS. For 12 patients there was deviation from allocated treatment, with a tendency for more children to receive SDF than allocated. Interviews were conducted with 61 participants. Constructs from all CFIR domains were represented. Areas found to hinder SDF implementation were contracts, remuneration and licencing. SDF application not requiring restoration was simultaneously supportive and detrimental to implementation.

Discussion

SDF addressed an unmet need and facilitated the treatment of children in primary dental care. Interestingly, many teeth were restored following SDF application owing to concerns over social perceptions, efficacy and function. Lack of equipoise challenged the feasibility of a trial, leading to tension between adhering to randomisation and patient-centred care.

Poster Number: 3

Authors:

Zahra Khubrani, Dr. Rachael Pattinson, Prof. Nicola Innes – Cardiff University

Title:

Patient and Dental Professional Perspectives on Smile Aesthetics: A Scoping Review Protocol

Abstract:

Background: Restorative dentistry enhances oral health and function, with evidence indicating such improvements positively impact oral health-related quality of life. Aesthetic outcomes are linked to self-esteem, as patients often associate their appearance with confidence and social well-being. The rising demand for dental treatments improving smile aesthetics underscores their growing importance. However, patients' goals and expectations for smile aesthetics and how well these align with those of dental professionals remain unclear. Discrepancies in these perspectives would indicate a need for shared decision-making in treatment planning and the use of both clinician- and patient-reported outcome measures in treatment evaluation. Addressing this gap in knowledge is essential for delivering more effective and patient-centered restorative dental care.

Objective: We will explore the goals, expectations, and priorities of patients and dental professionals regarding smile aesthetics dentistry. Additionally, we will examine whether these perspectives align or differ and identify how patient and dental professional views (e.g. satisfaction) on smile aesthetics have been assessed in the literature.

Methods: We will follow the JBI methodology for scoping reviews. The review will include quantitative, qualitative, and mixed-methods studies. Searches will be conducted across MEDLINE (Ovid), EMBASE (Ovid), CINAHL (EBSCOhost), PsycINFO (Ovid), and Scopus (Elsevier). Inclusion criteria will focus on studies examining smile aesthetics in adult dental patients and dental professionals, regardless of specific interventions. Only English-language, peer-reviewed publications will be included. Titles, abstracts, and full texts will be screened by two reviewers, with data synthesised using narrative and tabular formats.

Results: As a protocol, results are not available yet. It is anticipated that the findings will include a comprehensive mapping of the number of studies, their settings, and the dental specialties that have explored smile aesthetics. The review is also expected to provide a detailed list of outcomes that dental patients and professionals consider important in relation to smile aesthetics, as well as an overview of the methods used in the literature to assess smile aesthetics. This poster will focus on the review rationale.

Conclusion: This scoping review will identify gaps in the literature and provide insights into patient and professional perspectives on smile aesthetics, guiding future research and enhancing patient-centered dentistry.

Poster Number: 4

Authors:

Dr Manon Fflur Pritchard, Dr Melanie Wilson, Dr Nervo Verdezoto Dias, Dr Nikul Patel, Professor David Williams– Cardiff University

Title:

Stakeholder and end-user engagement to design, develop, and feasibility test, a digital platform for antimicrobial resistance surveillance in head and neck infections

Abstract:

Background: Dentists account for ~10% of all antibiotic prescriptions globally, which are often prescribed on an experiential basis compounded by the reality that patients are often prescribed antibiotics in contradiction to clinical guidelines in the UK. Furthermore, despite numerous antimicrobial resistance (AMR) stewardship schemes, the rate of antibiotic prescribing in dentistry continues to surpass the pre-pandemic rates and hospital admissions with severe dentoalveolar infection have increased >3.5 fold over the last two-decades. Alarmingly, there is a distinct lack of multi-center surveillance of AMR in head and neck infections.

Methods: Taking a human-centered design approach, we will design a digital platform to identify the bacteriological profile and AMR pattern of microbial isolates from head and neck infections. To achieve this, we will run workshops to engage with a Patient and Public Involvement and Engagement (PPIE) group (n=12) and purposive sampling of an Advisory Group (academics, clinicians, digital health specialists and the One Health Digital Health Hub [UCL]) to explore potential ideas to iteratively develop and test a visual high-fidelity prototype/proof of concept, whilst addressing the main challenges and opportunities.

The objectives of these activities will be to:

1. determine the need for a dedicated head and neck reference unit to support AMR surveillance

2. plan and design a digital platform as a data environment for enhanced AMR surveillance

3. to explore the feasibility and functionality of potential prototypes for the digital platform

Results: The planned workshops with PPIE representatives and Advisory Group will be hosted over the next 6 months. The anticipated results will be to create a prototype digital platform for translation into clinical practice to more accurately guide the treatment of patients; to inform local, national and regional actions; to enhance understanding of existing and emerging microbial threats and to monitor the effectiveness of interventions for example policy change. This new partnership will also address the need for a head and neck reference unit.

Conclusion: Our intended impact is to create a strategic plan for an efficient, secure, and UK-wide collaborative approach to enhanced AMR surveillance, enabling better data integration and informed decision-making to combat AMR.

Poster Number: 5

Authors:

Asees K Lamba, Anna Graham, Aylen Dervish, Sujeev Mathur, Mina Vaidyanathan - Guy's and St. Thomas' Hospitals NHS Foundation Trust & Evelina London Children's Hospital

Title:

Infective Endocarditis and Dental Screening – why are we missing the window of opportunity?

Abstract:

Background/Introduction: Cardiac patients, including those with a history of infective endocarditis (IE) or rheumatic fever are at an increased risk of developing IE. This is a rare but serious and life-threatening infection, with a high mortality rate. National guidelines for Congenital Heart Disease recommend a dental assessment within 72 hours of a diagnosis of IE to rule out a dental cause and signpost appropriate management and treatment.

Purpose: This project highlights the importance of dental screening service for patients with cardiac conditions at risk of developing IE or who present with IE. A streamlined service is required Evelina London Children's Hospital (ELCH) is a world-leading cardiac centre, with a specialist ECMO unit in Paediatric Intensive Care Unit (PICU).

Methods: Data was collected from an existing dental screening service provided on outpatient clinics and inpatient wards via a consultant-to-consultant referral.

Results: Twelve patients with infective endocarditis admitted to ELCH were screened from March 2019 to May 2022. 50% required assessment and/or treatment in the Paediatric Dentistry Department. Unfortunately, not all assessments were carried out within 72 hours. As a result, a tailored oral health leaflet was created to explaining the link between cardiac conditions and dental health, including how to maintain dental health. Teaching was provided to dental, cardiology and paediatric teams. To ensure IE patients are assessed in a timely manner, a referral pathway was developed allowing referrals from PICU nursing staff as well as medical teams for a consultant-led dental screening service. Following this, two patients were admitted to ELCH from October 2023 to December 2024. One received a dental assessment within 72 hours of admission and the other did not receive a dental assessment.

Conclusions: A multifaceted referral approach allows opportunistic dental screening to patients at risk of IE demonstrating the relevance and importance of optimum oral health and its role in prevention of IE. Early detection of active dental disease prevents the risk of patients developing IE and experiencing adverse outcomes. Patients presenting with IE should be seen within 72 hours for oral assessment to rule out a dental cause, therefore good communication between the dental and cardiology teams is paramount.

Poster Number: 6

Authors:

Hengjia Zhang, Joe Donaldson, James Scott – University of Sheffield

Title:

Are Ultrasonography and Dental Magmatic Resonance Imaging Techniques the Future of Dental Implantology? A Systematic Review and Meta-Analysis

Abstract:

Background: Dental implants are a cornerstone for reconstructing tooth loss, necessitating precise imaging for effective implant placement. With concerns about the cumulative radiation exposure from conventional imaging like Cone-Beam Computed Tomography (CBCT), non-ionizing alternatives such as Magnetic Resonance Imaging (MRI) and Ultrasonography are gaining attention for their potential to reduce health risks and improve diagnostic efficacy.

Methods: This systematic review adheres to PRISMA guidelines, focusing on non-ionizing imaging techniques for pre- and post-dental implant evaluation. Utilizing databases such as MEDLINE and Scopus, we compared the diagnostic accuracy and feasibility of MRI and Ultrasonography against traditional imaging methods, with a focus on anatomical structure assessment, treatment planning, and surgical outcomes.

Results: Twelve studies qualified for inclusion, showing MRI and Ultrasonography provided high diagnostic accuracy in identifying critical anatomical landmarks necessary for implant placement. MRI was noted for its precision in bone structure assessment, with a diagnostic accuracy comparable to CBCT, while Ultrasonography excelled in soft tissue visualization, critical for perioperative assessments. Specifically, MRI demonstrated a mean deviation of less than 0.5mm for implant placement compared to CBCT. Ultrasonography showed a 95% confidence interval for soft tissue thickness measurements within 0.1mm of direct measurements, emphasizing its reliability for clinical use. Both modalities showed potential in reducing procedural risks by avoiding radiation exposure.

Conclusion: Non-ionizing imaging modalities like MRI and Ultrasonography present viable alternatives to traditional imaging techniques in dental implantology. They offer significant advantages in terms of safety and diagnostic accuracy, particularly for soft tissue evaluation and dynamic surgical guidance. Further research and technological advancements will be crucial in establishing these methods as standard practices in implant dentistry.

Keywords: Dental Implantology, MRI, Ultrasonography, Non-ionizing Imaging, Systematic Review, Meta-Analysis

Poster Number: 7

Authors:

Hishaam Ahmad – King's College London

Title:

A comparative study of laser-assisted versus stem cell-based approaches for periodontal tissue repair: a literature review

Abstract:

Background: Periodontal disease is a global health concern that often leads to the destruction of supportive tissues, including bone and gingiva, and, if untreated, tooth loss. Effective regenerative strategies are essential to restore periodontal integrity, with laser-assisted therapies and stem cell-based approaches showing promise in periodontal tissue repair. Lasers are known for bacterial reduction, tissue healing, and regeneration enhancement through mechanisms like photobiomodulation. Conversely, stem cell-based methods restore tissues via the differentiation of mesenchymal stem cells into periodontal structures, including bone and ligament. Despite their potential, the comparative effectiveness, limitations, and possible synergies of these approaches remain underexplored. This review evaluates their efficacy, mechanisms, and clinical applicability while identifying research gaps.

Methodology: Findings were synthesised from peer-reviewed journals, clinical trials, and meta-analyses published between 2010 and 2025. Searches in PubMed and ScienceDirect used terms like "periodontal regeneration," "laser therapy," "stem cell therapy," and "tissue healing." Studies with robust methodologies, comparative analyses, and hybrid therapies were prioritised to identify trends, challenges, and benefits.

Results: Laser-assisted therapies, particularly Er:YAG and Nd:YAG lasers, effectively reduce periodontal pocket depths, decontaminate root surfaces, and promote soft tissue healing. They are minimally invasive and well-accepted by patients, making them ideal for early and intermediate-stage periodontal therapy. However, their ability to regenerate bone and ligament is limited. Stem cell-based therapies show greater potential for true tissue regeneration, enabling differentiation into osteoblasts, cementoblasts, and fibroblasts. Preclinical and clinical studies reveal promising outcomes, though high costs, complex protocols, and variable results hinder widespread clinical adoption. Hybrid approaches combining lasers with stem cell delivery enhance stem cell viability, proliferation, and differentiation by modulating the microenvironment and reducing inflammation.

Conclusion: Lasers excel in pocket reduction and tissue healing, while stem cells offer superior regenerative capabilities. Further clinical trials are needed to assess long-term outcomes, cost-effectiveness, and the benefits of combining these therapies. Advancing this research could lead to more effective, patient-centered periodontal treatments.

Poster Number: 8

Authors:

Mohammed Abdullah Alshehri, Nasser Raqe Alqhtani, Abdullah Saad Alqahtani, Khalid Fahad Al-Harbi, Abdulaziz maree Alqahtani, Mahmud Uz Zaman - Prince Sattam Bin Abdulaziz University

Title:

Analysing the Depth of the Submandibular Fossa: A Retrospective Study

Abstract:

Objectives: This study aimed to identify the deepest point of the submandibular fossa (SF) and evaluate its correlation with the distances to the inferior alveolar canal (INC) and alveolar crest. Additionally, variations in SF depth and its positional relationships were assessed across genders and mandibular sides (right vs. left).

Methods: A retrospective cross-sectional analysis was conducted on 200 CBCT scans (116 males, 84 females), yielding 400 sides. CBCT images were analysed to identify the deepest point of the submandibular fossa (SF) and assess its correlation with the distances to the inferior alveolar canal and alveolar crest. Additionally, evaluate its correlation with the position of the inferior alveolar canal (classified as superior, parallel, or inferior). Measurements were conducted using I-CAT Vision software, and intra- and inter-observer reliability was evaluated using the Intraclass Correlation Coefficient (ICC). Statistical analyses, including Pearson correlation and t-tests, were performed using SPSS.

Results: The mean SF depth showed significant correlations with the distances to the alveolar crest and INC ($p < 0.05$). The INC's positional relationship with the SF shows on right side more inferior relationship while on the left side was comparable between parallel and inferior relation of INC position with no significant difference. Males demonstrated deeper SF measurements compared to females. Intra- and inter-observer reliability demonstrated excellent agreement (ICC > 0.9).

Conclusions: CBCT provides precise evaluation of SF depth and its anatomical relationships, enhancing the safety of implant planning in the posterior mandible. Gender and mandibular side had minimal impact on SF depth. The study emphasizes the importance of preoperative CBCT analysis to assess correlations between SF depth, alveolar crest distance, INC distance and position, facilitating the prevention of surgical complications.

Keywords: submandibular fossa, dental implant, interior alveolar canal, cone-beam computed tomography

Poster Number: 9

Authors:

Tokunbo A, Benedict A, Ernest M, Efunkoya A – University of Ibadan

Title:

Provision of Orthodontic Care to Children Affected with Cleft Lip and Palate in Nigeria.

Abstract:

INTRODUCTION: A high incidence and prevalence of Cleft Lip and Palate (CL/P) have been reported in the poorer nations of the world, with most children born with CL/P also hailing from deprived and low socio-economic backgrounds. Orthodontic treatment is essential as recommended in the protocol of children born with CL/P orthodontic treatment and can be done in both the pre-surgical and post-surgical stages of management. Free orthodontic treatment may be offered to children affected with CL/P by sponsors and cleft charities. This study reports the experience of some Orthodontists offering orthodontic care to children affected with CL/P.

MATERIALS AND METHODS: Data was collected from questionnaires administered to orthodontists working in Nigeria. The questionnaire had sixteen items that had to do with socio-demographic data; type of orthodontic treatment offered; mode of payment; number of affected children seen on yearly basis and most common reason for referral.

RESULTS: Twelve orthodontists responded,10 females; 2 males; age group 31-40 years (57.3%) ;41-50 years (42.7%). Eleven (91.7%) of the orthodontists worked in government hospitals and just one (8.3%) worked in Private. All the orthodontists had gone through the residency training program but none of them was a cleft care specialist. The Nigerian orthodontists see between 1-20 babies (aged 0-3 months) and children (aged 7-12 years) affected with CL/P in their clinic.

The most common treatment, orthodontists in Nigeria offer to Children affected with CL/P is Naso-Alveola Molding (NAM) (91.6%); Removable appliance (25%) Fixed Appliance (8.3%). Plaster strapping of the lips was reported as the most common method of achieving NAM. Children affected with CL/P in Nigeria (66.7%) are often referred to the speech therapist for help with their speech and pronunciation.

CONCLUSION: Orthodontists working in Nigeria would see on an annual basis between 1-20 patients born with CL/P. The most common form of treatment offered by orthodontists to children affected with CL/P in Nigeria is Naso-Alveolar Molding.

Poster Number: 10

Authors:

Melek Atille Aydin, Serkan Dundar – Kings College London

Title:

Comparison of the Effects of Two Different Bone Grafts Used İn Alveolar Ridge Augmentation

Abstract:

Background: Caries management has advanced significantly with minimally invasive techniques aimed at preserving healthy tooth structure. Traditional mechanical methods, while effective, often result in the unnecessary removal of sound dentine, compromising tooth strength. The Er:YAG laser has emerged as a promising alternative for selective caries removal, offering precise ablation through water-mediated photothermal mechanisms and antibacterial properties. These lasers also enhance patient experience by reducing the need for local anaesthesia. Despite growing evidence supporting their use, aspects of their effectiveness, including precision, antibacterial efficacy, and long-term impact on tooth health, remain underexplored. This study evaluates these advancements, highlighting the Er:YAG laser's potential to revolutionise caries management.

Methodology: Electronic databases (PubMed, Google Scholar) were searched using terms like "Er:YAG laser," "selective caries removal," and "patient experience." Studies from the last 10 years meeting relevance and quality criteria were analysed. Key parameters, including tooth preservation, antibacterial efficacy, and patient comfort, were assessed to evaluate the clinical performance of Er:YAG lasers.

Results: Patient feedback indicated a favourable experience, with 93.8% of children reporting comfort and minimal discomfort from vibration (19.4%). The laser's ability to selectively target water-rich carious tissue, due to its higher chromophore absorption, reinforces its role as a minimally invasive and conservative tool for caries removal. This precision enables the creation of therapeutic cavity preparations that preserve healthy tissue, avoiding unnecessary extension into sound dentine. The fluorescence feedback system further enhanced precision by effectively marking carious lesions through red fluorescence caused by porphyrins and metalloporphyrins in infected dentine, eliminating the need for traditional dyes. The fluorescence feedback system ensured precision, achieving clinically insignificant bacterial levels (<100 CFU/sample) in over 90% of dentine samples, despite residual bacteria in 42.9%. Only 7.1% of samples exceeded 100 CFU, underscoring the laser's antibacterial efficacy.

Conclusion: The Er:YAG laser shows promise as a minimally invasive, patient-friendly alternative for caries removal, effectively preserving healthy tooth structure and reducing bacterial loads. However, further studies are needed to address procedural limitations, such as optimising caries removal thresholds, mitigating over-excavation risks, and enhancing tactile feedback for improved clinical precision.

Poster Number: 11

Authors:

Farhaan Lohn– Kings College London

Title:

Considering the effectiveness of ER:YAG lasers in practice as an alternative to traditional methods for caries removal

Abstract:

Background: Caries management has advanced significantly with minimally invasive techniques aimed at preserving healthy tooth structure. Traditional mechanical methods, while effective, often result in the unnecessary removal of sound dentine, compromising tooth strength. The Er:YAG laser has emerged as a promising alternative for selective caries removal, offering precise ablation through water-mediated photothermal mechanisms and antibacterial properties. These lasers also enhance patient experience by reducing the need for local anaesthesia. Despite growing evidence supporting their use, aspects of their effectiveness, including precision, antibacterial efficacy, and long-term impact on tooth health, remain underexplored. This study evaluates these advancements, highlighting the Er:YAG laser's potential to revolutionise caries management.

Methodology: Electronic databases (PubMed, Google Scholar) were searched using terms like "Er:YAG laser," "selective caries removal," and "patient experience." Studies from the last 10 years meeting relevance and quality criteria were analysed. Key parameters, including tooth preservation, antibacterial efficacy, and patient comfort, were assessed to evaluate the clinical performance of Er:YAG lasers.

Results: Patient feedback indicated a favourable experience, with 93.8% of children reporting comfort and minimal discomfort from vibration (19.4%). The laser's ability to selectively target water-rich carious tissue, due to its higher chromophore absorption, reinforces its role as a minimally invasive and conservative tool for caries removal. This precision enables the creation of therapeutic cavity preparations that preserve healthy tissue, avoiding unnecessary extension into sound dentine. The fluorescence feedback system further enhanced precision by effectively marking carious lesions through red fluorescence caused by porphyrins and metalloporphyrins in infected dentine, eliminating the need for traditional dyes. The fluorescence feedback system ensured precision, achieving clinically insignificant bacterial levels (<100 CFU/sample) in over 90% of dentine samples, despite residual bacteria in 42.9%. Only 7.1% of samples exceeded 100 CFU, underscoring the laser's antibacterial efficacy.

Conclusion: The Er:YAG laser shows promise as a minimally invasive, patient-friendly alternative for caries removal, effectively preserving healthy tooth structure and reducing bacterial loads. However, further studies are needed to address procedural limitations, such as optimising caries removal thresholds, mitigating over-excavation risks, and enhancing tactile feedback for improved clinical precision.

Poster Number: 12

Authors:

Nadirah A N Ahmed, Chen Chen, Milena De Felice, Fiona M Boissonade, Ning Ma, Thomas E Paterson – University of Sheffield

Title:

Multimodal Sensor Approaches for Non-invasive Bruxism Detection

Abstract:

Bruxism, the habitual grinding or clenching of teeth, is a prevalent condition with significant implications for oral health, contributing to temporomandibular joint dysfunction, chronic headaches, and dental damage. Accurate diagnosis remains challenging, often relying on subjective self-reports or delayed clinical observations after substantial harm has occurred. Current measurement techniques typically require prolonged monitoring, further complicating early intervention.

This study investigates the potential of using multimodal facial sensors to assess bruxism'. Electromyography (EMG) and sound frequency sensors were strategically placed over temporalis, frontalis and masseter muscles to capture signals associated with bruxism, and comparisons were made between responses recorded at different placements.

A pilot trial involving six healthy participants evaluated the power spectral density and signal-to-noise ratios (SNR) of sensors during simulated grinding and clenching episodes, as well as during obfuscating actions such as talking and yawning. Our exciting new findings suggest that bruxism can be detected from sensors placed at a range of locations, providing a foundation for development of user-friendly and unobtrusive diagnostic tools. So allowing for maximal consideration of patient comfort and tolerance.

This work highlights the potential for innovative sensor systems to monitor bruxism in a minimally intrusive manner. By leveraging multimodal detection techniques, these systems can overcome the limitations of traditional diagnostic methods, enabling earlier interventions and improve the management of bruxism.

Poster Number: 13

Authors:

Rahaf Alshahrani, Farida Fortune – Queen Mary University London

Title:

The Role of Vitamin D and Its Metabolic Pathways in Behçet's Disease

Abstract:

Behçet's Disease (BD) is a multisystem inflammatory disorder characterized by recurrent oral and genital ulcers, skin lesions, and uveitis. Its etiopathogenesis remains unclear, with genetic, immunological, and environmental factors implicated. This study investigated the role of vitamin D and related enzymes in BD, focusing on their association with disease activity and phenotype. Serum 25-hydroxyvitamin D levels were measured in 79 BD patients and 29 healthy controls using ELISA. Vitamin D receptor (VDR) expression and the relative levels of vitamin D-metabolizing enzymes (CYP27A1, CYP2R1, CYP27B1, CYP24A1) were also analyzed.

Results revealed significantly higher median serum vitamin D levels in BD patients compared to controls. Variations in VDR expression and CYP27B1 levels were observed, suggesting their involvement in BD-associated inflammatory processes. Correlation analysis highlighted strong positive interactions between VDR and several vitamin D-related enzymes, particularly CYP27A1, indicating complex regulatory mechanisms . Additionally, serum vitamin D levels were associated with inflammatory markers, including C-reactive protein (CRP) and calcium, supporting vitamin D's anti-inflammatory role. Higher vitamin D levels correlated with lower disease activity, as measured by the Behçet's Disease Current Activity Form (BDCAF) score, suggesting a modulatory effect on disease severity.

This study emphasizes the significance of vitamin D and its metabolic pathways in BD pathogenesis and highlights their potential as therapeutic targets. Future research should explore these findings to develop effective strategies for managing BD.

Poster Number: 14

Authors:

Urszula Uryszek, Esther Brewer – Cardiff Dental Hospital

Title:

Immediate and Delayed Steroid Management of Sodium Hypochlorite Extrusion

Abstract:

Objectives:

This literature review investigates the role of steroid therapy in managing sodium hypochlorite (NaOCl) extrusion injuries during root canal treatment, supplemented by a case presentation of a 60-year-old patient.

Methods:

A comprehensive review of case reports, case series, and clinical guidelines was conducted to examine timing, dosage, and outcomes of steroid administration post-NaOCl extrusion. In the presented case, the patient arrived 24 hours after an NaOCl extrusion injury with diffuse swelling and bruising. Prior management included oral amoxicillin but no steroids. Upon hospital admission, she received intravenous co-amoxiclav and dexamethasone.

Results:

The literature consistently highlights early steroid administration (ideally within 24 hours) as a key factor in mitigating inflammatory responses and limiting tissue necrosis. Regimens commonly start with immediate dexamethasone doses of 4–8 mg, followed by tapering over 2–3 days. Some reports describe extended steroid courses (up to 6 days), though rationales for longer therapy are often unclear. Delayed administration beyond the first day is rarely documented, and one severe case demonstrated bone necrosis despite early steroid use, suggesting that additional factors (e.g., pre-existing infections) can exacerbate tissue damage. All cases with immediate steroid management appeared to report quicker recovery and better final outcomes in comparison to delayed administration.

Conclusion:

Prompt steroid therapy can help control NaOCl-induced tissue necrosis, yet standardised guidelines regarding dosing and duration remain lacking. Timely referral from primary care, where steroids are not available on prescription, to secondary care is crucial for optimal management. This however puts greater pressures on oral surgeons in such units who will have to manage preventable complications. Further research is needed to establish definitive protocols and assess outcomes of delayed steroid intervention.

Poster Number: 15

Authors:

Isabel Cristina Olegário, Rona Leith, Anne C. O'Connell - School of Dentistry - Royal College of Surgeons in Ireland (RCSI)

Title:

The use of vertical bitewings compared to visual examination alone for dental caries diagnosis and treatment planning in paediatric dentistry - A cross-sectional study

Abstract:

Introduction: The effectiveness of vertical bitewing radiographs (VBW) for caries diagnosis in primary molars has not been investigated.

Methods: Children aged 5-10 years with high caries risk were examined clinically and then using VBW. Treatment decisions were made after each intervention and were categorised into control (CT), non-restorative treatment (NRT), restorative treatment (RT) and treatment of the necrotic tooth (TNT). Descriptive and statistical analysis was performed using Stata 17.0 (α=5%).

Results: Proximal surfaces (n=529 primary molars, 889 proximal surfaces) in 75 children were included in the study. Radiographic dentine caries lesions were detected in 7% of the clinically sound surfaces. Caries into pulp or interradicular radiolucency was observed radiographically in 30% of teeth that had deep caries lesions with no clinical signs of pulp necrosis. Treatment changes were required for 174 surfaces (19.57%) after radiographic examination (CT to NRT=116; CT to RT=21; NRT to RT=26; RT to TNT=11). Changes were significantly more frequent for the distal surfaces of first primary molars and mesial surfaces of second primary molars ($p<0.001$).

Conclusion: VBW increased the detection of proximal caries lesions in primary molars compared to visual examination, however most of those lesions were restricted to enamel. The majority of changes in the treatment decision after radiographic examination occurred from CT to NRT. Vertical bitewings allowed the determination of the depth of dentine caries, proximity to pulp and signs of pulp necrosis, and presence of permanent sucessors, which are essential for treatment planning for deep caries lesions.

Poster Number: 16

Authors:

Kuoh Buolikeze, Chris Louca, Carolina Machuca-Vargas

Title:

Parental oral health knowledge and self-efficacy in improving oral health behaviours of primary school children 5-6yrs in Yaoundé, Cameroon.

Abstract:

Background: Early childhood caries (ECC) affects 60-90% of children worldwide and has extensive implications on their oral health as they grow into adulthood. Self-efficacy or parents' perception of their ability to deliver the behaviour of regular toothbrushing can significantly impact children's oral health. Our study assessed parental oral health knowledge and self-efficacy in improving children's oral health-related behaviours.

Methods: A mixed-method longitudinal prospective cohort study with children aged 5-6 years old and their parents was conducted at three primary schools in Cameroon. Children received a dental screening, oral health education, and supervised tooth brushing training using plaque-disclosing tablets. Parental self-efficacy and oral health knowledge were assessed using self-reported questionnaires. Intervention evaluation was through interviews with parents, teachers, and dentists.

Results: Among 112 children screened, caries prevalence was 64.6%, with a deft index of 2.43. No child in the study presented with any form of filled tooth upon examination. Of 91 responding parents, self-efficacy was low, and only a few (3%) supervised their children's tooth brushing habits. More than half of the parents (59%) said they had never visited the dentist with their children, and most children visited the dentist only when they had a problem. About 59.3% of parents had a fair oral health knowledge score. However, most parents had a positive attitude towards oral health. Moreover, parents with primary educational levels had significantly lower knowledge scores.

Discussion: While causes of tooth decay were well-known to many parents, they often neglected their children's tooth-brushing habits. Although parents generally have confidence in their ability to meet their children's needs, factors such as parental depression, stress, anxiety, and a child's temperament contribute to low parental self-efficacy. The lack of structure or bedtime routine for children in most homes is a major issue in the practice of supervised tooth brushing in homes. Providing access to parenting training and a supportive environment can improve parents' self-efficacy in improving children's oral health.

Conclusion: Parents' ability to model good oral health behaviours and not just knowledge, impacts children's oral health habits.

Poster Number: 17

Authors:

Dr Zahraa Maiter, Dr Kirstie Lau, Dr Kunal Patel - Royal London Dental Hospital- Barts NHS Trust

Title:

Service Evaluation of Intravenous Sedation for Paediatric Patients: Royal London Dental Hospital

Abstract:

Our service evaluation is aiming to look at the quality and quantity of intravenous sedation provided to paediatric patients (aged 12-16) within the Royal London Dental Hospital paediatric department. Intravenous sedation for children is a growing area of research and is not widely carried out in dental hospitals in the UK yet, therefore carrying out a service evaluation can be useful in not only improving our own department services, but providing more information on a form of sedation which could be implemented in a wider hospital setting in the future.

The evaluation looks at patient's seen from 2022 to 2024 (45 patients were treated during this time period). Areas of evaluation include patient demographics, anxiety management measures, dental treatment provided and intravenous sedation provided. The results and trends of these areas would be presented through poster format, with the results being compared to previous service evaluations carried out at other UK-based dental hospitals.

Results analysed so far show trends in terms of patient demographics seen, such as minimal medically complex patients seen on clinic and ASA grades limited to one and two. The patient base was predominantly male and attending from areas ranked on the multiple index of deprivation as 1-7th decile. Patients tended to have high BMI's and the average age was 14. Most patients were not seen by clinical psychology before treatment but the majority had been seen for a separate sedation assessment appointment prior to starting treatment. The most common site for cannulation was the antecubital fossa and most dental treatments involved extractions.

The ultimate conclusion from the service evaluation is that intravenous sedation appears to be a safe and reliable form of sedation for treatment of paediatric patients aged 12-16, and should be an area that is further researched with looking at larger patient samples and comparing studies from different hospitals to form a guideline for the provision of paediatric intravenous sedation.

Poster Number: 18

Authors:

Mohammed Alabbad, Nick Silikas, Andrew Thomas – University of Manchester

Title:

The Impact of Decontaminating Rotary Brushes Used in Supportive Peri-Implant Therapy on Titanium Abutments Surface Topography

Abstract:

Purpose: Peri-implantitis is a common biological complication affecting dental implants. Mechanical decontamination is essential in its management, with rotary brushes increasingly used to decontaminate implant surfaces. This study aimed to evaluate the effects of six commercially available rotary brushes on the surface topography of titanium abutments.

Materials and Methods: Seventy machined titanium discs were randomly assigned to seven groups (n = 10): i-Brush1 (IB), NiTiBrush Nano (NiTiB), Peri-implantitis Brush (PIB), Labrida BioClean Brush (LB), Prophy Cup (PC), Prophy Brush (PB), and a control group. Each disc was instrumented for 60 seconds with copious irrigation, following the manufacturer's guidelines. Surface morphology was evaluated using Scanning Electron Microscopy (SEM), and surface roughness was measured using optical interferometry. Statistical analysis was conducted with the Kruskal-Wallis test, followed by the Dunn-Bonferroni post-hoc test to assess group differences, with significance set at $p < 0.05$.

Results: SEM analysis revealed distinct surface alterations, including scratches in all experimental groups, with varying degrees of surface damage. Non-metallic brushes left residual contaminants on the surface after instrumentation. Both average surface roughness (Sa) and developed interfacial ratio (Sdr) were significantly increased in the IB, PIB, and NiTiB groups compared to the control ($p < 0.05$). Conversely, the LB, PC, and PB groups showed no significant changes in Sa and Sdr values ($p > 0.05$).

Conclusion: The findings indicate that metallic brushes significantly altered the surface topography of titanium abutments, whereas non-metallic brushes left contaminants on the surface without significantly altering roughness parameters.

Poster Number: 19

Authors:

Tanya Naib – University of Plymouth

Title:

Taking a Reorganised Approach

Abstract:

I am applying to submit a case I have completed for the Clinical Poster Presentation. This case involves increasing the vertical dimension of a patient with severe tooth surface loss.

The patient presented with extensive tooth-ware, without loss of occlusal vertical dimension. This indicated the presence of dental-alveolar compensation.

I started this case in my penultimate year and am now in the final stages of the treatment plan. Throughout this process, I have thoroughly documented each stage with photographs to show my clinical work at each stage.

The occlusal analysis was vital in identifying the amount of restorative space available and, thus, the possible treatment options presented to the patient. A facebow was used to take occlusal records in centric relation, as the patient had no current stable occlusion. The bi-manual manipulation technique was used to achieve this reproducible position. Casts were mounted on a Semi-adjustable articulator to analyse occlusion & assess restorative space available.

Once the risks and benefits of each option were discussed, the patient opted to reorganise their occlusion using composite build-ups at an increased verticle dimension and a removable partial denture. A diagnostic wax-up was used to plan the composite build-ups, which were completed free-hand according to the planned dimensions.

A systematic approach was crucial for this case. The treatment plan was formulated using the National Institute of Health and Care Excellence (NICE) guidelines, Delivering Better Oral Health and the British Society of Restorative Dentistry's "Tooth Wear Guidelines".

This case has elevated my understanding of the principles of restorative dentistry and challenged me to read further into how occlusion can be manipulated to reestablish a functional dentition and improve the patient's quality of life.

I am particularly enthusiastic about sharing this case because it has significantly enhanced my understanding of restorative dentistry, and it has been great to see the patient’s confidence grow with each appointment.

I truly believe that other dental students will find this case fascinating and beneficial and find elements that apply to the cases they tackle during their studies.