SMART DENTAL UPDATES

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Dear Doctor,

Greetings from Micro Labs Limited. We are happy to bring you **"SMART DENTAL UPDATES"** which contain latest and interesting news in the field of Dentistry.

This issue contains:

- **Saliva microbiome alteration in people with dental fluorosis**
- **The gender-specific correlations between dental aesthetics, oral health-related quality of life, and aesthetic satisfaction in adults**
- **Comparision of the caries-preventing effects of 5% sodium fluoride varnish (FV) and 38% silver diamine fluoride solution (SDF) in children.**
- **A case report on the treatment of dental defects in a young child with increasing familial intrahepatic cholestasis**

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Looking forward to your valuable feedback

Saliva microbiome alteration in people with dental fluorosis

Introduction:

Hypomineralization is a characteristic of dental fluorosis (DF), an enamel deformity caused by prolonged exposure to excessive fluoride when teeth are still developing. Its porous quality is shown by clinical symptoms including enamel opacities, discolouration, or stains, as well as major defects [(1)]. The non-metallic element fluorine, which takes the form of fluoride, is present in the Earth's crust in relatively high concentrations (525 ppm). Due to its potential as a target for disease or a disease-related biomarker, the microbiota is frequently studied. There is also a relationship between fluoride and bacteria. The study's goal is to investigate variations in the dental fluorosis population's saliva microbiome [(2)].

Methods:

A total of 957 college students were assessed for dental fluorosis prevalence. The prevalence and severity of dental fluorosis were recorded using Dean's index as follows: 0 denotes "normal," 0.5 "doubtful," 1 "very mild," 2 "mild," 3 "moderate," and 4 "severe" and Assessed the changes in the salivary microbiome's composition. Each participant gave a total of 3 mL of saliva, with 1 mL of each sample being used for microbiome analyses. To investigate the connection between gender and dental fluorosis, SPSS 20.0 was used. A Pearson chi-square test was used to compare the data at a theoretical frequency ≥ 5.

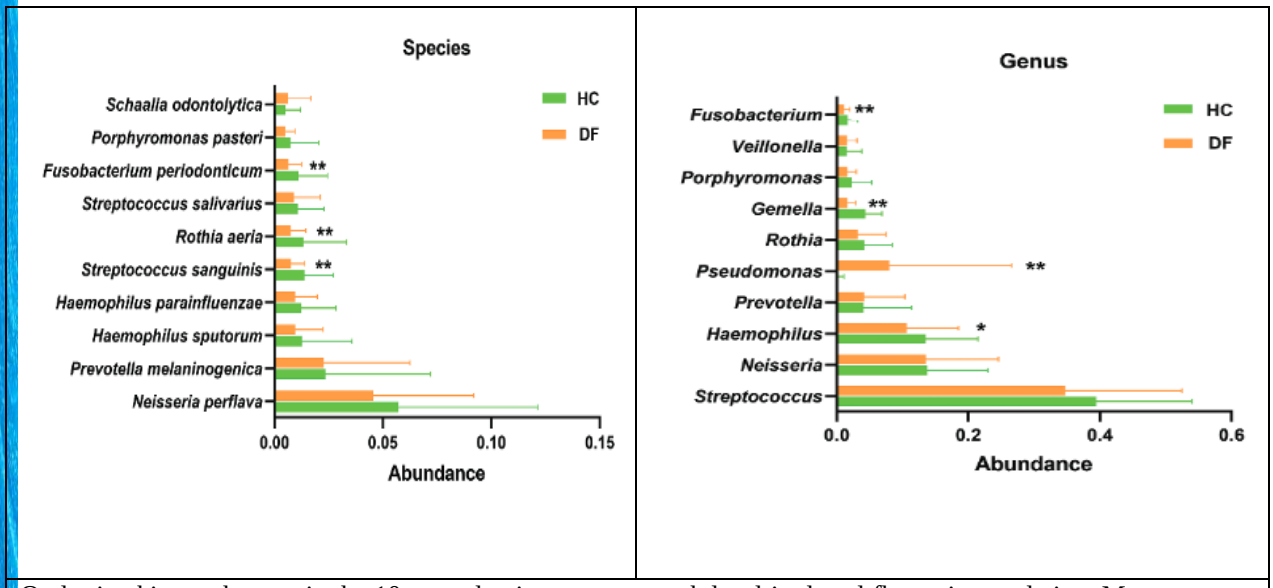
Results:

The prevalence of dental fluorosis among the 957 college students surveyed was 47% (n = 450), with male and female prevalence rates of 49.8% and 44.7%, respectively. The microbiota of patients with dental fluorosis exhibited increased diversity when compared with healthy controls, with increased abundance of *Treponema lecithinolyticum, Vibrio metschnikovii, Cupriavidus pauculus, Pseudomonas, Pseudomonadaceae, Pseudomonadales,* and decreased abundance of *Streptococcus mutans, Streptococcus sanguinis, Gemella*, and *Staphylococcales*. In patients with dental fluorosis, function analyses revealed increases in arginine biosynthesis along with decreases in amino sugar and nucleotide sugar metabolism, fructose and mannose metabolism, and starch and sucrose metabolism.

Discussion:

Wang et al. previously analysed saliva samples from 42 adolescents with moderate or severe dental fluorosis, revealing a unique microbial profile in these patients [(3)]. Accordingly, this study analysis the larger group of dental fluorosis patients including those with mild disease offered the possibility to characterize the microbiota linked to this condition [(2)].

The richness and evenness of microbial communities are measured by alpha diversity. In the current study, patients with dental fluorosis had a significantly higher diversity and richness of the salivary microbiome compared to controls. Analysis of β diversity showed significant differences between dental fluorosis patients and controls, but there was no noticeable difference between patients with mild, moderate, and severe dental fluorosis in terms of saliva microbial diversity [(2)].



Oral microbiome changes in the 10 most dominant taxa at each level in dental fluorosis population. Metastats was used to assess differences in taxonomic composition. * represents corrected p-value less than 0.05. ** represents corrected p-value less than 0.01.

Conclusion:

This study concludes that dental fluorosis patients and healthy controls have remarkably different salivary microbiomes. Dental fluorosis may worsen systemic lung diseases and periodontitis. More studies are required to evaluate whether changing the salivary microbiota in people with dental fluorosis can alter oral or systemic diseases.

Patients with oral fluorosis and healthy individuals have significantly different salivary microbiomes. Dental fluorosis raises the risk of chronic pulmonary illnesses and periodontitis becoming worse.

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The gender-specific correlations between dental aesthetics, oral health-related quality of life, and aesthetic satisfaction in adults

Introduction:

The strong social demand for increased facial attractiveness and physically attractive people are thought to have more likable personalities, be more likely to secure prestigious jobs, be less likely to be single, and live happier, more fulfilling lives in general than less attractive people [(1)]. It has been found that dentofacial aesthetics has a major impact on how people view themselves and others. Smile aesthetics are considered to have societal advantages, but assessments of dentofacial aesthetics have been shown to go beyond physical attractiveness to take into account a person's behaviour, psychological makeup, and intellectual capabilities. This study looked at the relationships between dental aesthetics, oral health-related quality of life (OHRQoL), and dental aesthetic satisfaction in an adult population [(2)].

Methods:

There were 1780 participants in the study, 822 men and 958 women. Using the Aesthetic Component (AC) of the Index of Orthodontic Treatment Need (IOTN), dental aesthetics were assessed from digital 3D dental models. A smaller sample (n = 100) had its dental aesthetics assessed by laypeople and orthodontist panels. The Oral Health Impact Profile (OHIP-14) questionnaire was used to assess OHRQoL. Two questions are included in the OHIP-14's total questions, one for each of the seven conceptual dimensions of OHRQoL. The questions ask about the frequency of physical impairments, physical pain, psychological discomfort, physical disabilities, mental disabilities, social disabilities, and handicaps experienced by the subject. On a five-point Likert scale, each question about the previous month was answered (0 = never, 1 = hardly ever, 3 = fairly often, and 4 = very often). One distinct question was used to evaluate participants' satisfaction with dental aesthetics, and responses were graded on a Likert-type scale (1 = very satisfied, 2 = somewhat satisfied, 3 = quite unsatisfied, and 4 = very unsatisfied). Mann-Whitney U-test was used to analyse group differences, and analyses for each gender were done separately.

Results:

The Most people were happy with the aesthetics, and more than half of the population had an aesthetically pleasing occlusion. The psychological aspects of OHIP-14(The Oral Health Impact Profile-14) were linked to the most severe aesthetic impairments. AC and satisfaction with aesthetics and OHRQoL had significant but weak relationships. Significant gender differences were discovered, with men reporting lower OHRQoL and women reporting higher mean AC scores. Men had an average OHIP severity score of 3.14 while women had an average score of 3.99 (P = 0.001). Women also reported greater psychological distress,physical disability, and psychological disability than men (P <0.001, P = 0.021, and P < 0.001, respectively).

	MALE $n = 822$		FEMALE $n = 958$		P
	Mean	Md (Q_1–Q_3)	Mean	Md (Q_1–Q_3)	
AC	4.91	5 (4–6)	4.55	4 (3–6)	<0.001*
OHIP severity	3.14	2 (0–4)	3.99	2 (0–6)	0.001*
Functional limitation	0.17	0 (0–0)	0.20	0 (0–0)	0.887
Physical pain	1.33	1 (0–2)	1.47	1 (0–2)	0.481
Psychological discomfort	0.68	0 (0–1)	0.98	0 (0–2)	<0.001*
Physical disability	0.19	0 (0–0)	0.28	0 (0–0)	0.021*
Psychological disability	0.36	0 (0–0)	0.55	0 (0–1)	<0.001*
Social disability	0.19	0 (0–0)	0.21	0 (0–0)	0.552
Handicap	0.22	0 (0–0)	0.29	0 (0–0)	0.052
Satisfaction with aesthetics	2.16	2 (2–2)	2.21	2 (2–2)	0.266

The gender-specific mean and median (Q1 −Q3) values of the Aesthetic Component (AC) of the Index of Orthodontic Treatment Need (IOTN), the Oral Health Impact Profile (OHIP-14) severity and dimensions, and satisfaction with dental aesthetics.

Discussion:

This study examined the relationships between dental aesthetics, OHRQoL, and dental aesthetic satisfaction. Significant aesthetic defects were disadvantageous to psychological well-being. The aesthetic evaluations of orthodontist panels and layperson were parallel to the AC evaluations, and their associations with OHRQoL and satisfaction with aesthetics did not remarkably differ from those of AC [(2)]. In contrast, the study by Yabe A et al. demonstrates that laypeople's perceptions of dental aesthetics may vary from professionals' assessments [(3)].

According to a previous study by Silvia A.S. Vedovello et al, women tend to be more critical of their dental health than men and are to be more sensitive to OHRQoL effects, and to place a higher value on having well-aligned teeth [4]. In parallel to previous study, women in this study reported slightly more OHRQoL impacts compared to men.

Conclusion:

More than half of the participants had visually pleasing occlusion. The most serious aesthetic impairments were related to the psychological effects of OHIP-14, with women having more effects than males. Significant individual variance was seen in the links between oral aesthetics, OHRQoL, and aesthetic happiness.

Women reported more impacts than men did from OHIP-14's (The Oral Health Impact Profile-14) psychological components, which were associated with the most severe aesthetic impairments.

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Comparision of the caries-preventing effects of 5% sodium fluoride varnish (FV) and 38% silver diamine fluoride solution (SDF) in children.

Introduction:

Early childhood caries (ECC) is defined as one or more main teeth in children under the age of six that are missing, decayed, or filled. Dental caries that are left untreated can spread to the pulp and cause pain and infection. Children with poor primary dentition may have problems chewing, absorbing nutrition, growing, cognitive development, and having a better quality of life [(1)]. Clinical studies have demonstrated that silver diamine fluoride (SDF) can stop prevent dental caries in early infants. Antimicrobial silver prevents cariogenic biofilm growth. Fluoride encourages tooth remineralisation and prevents tooth demineralization. This clinical trial compared the caries-preventive effects of applying 5% sodium fluoride varnish (FV) and 38% silver diamine fluoride solution (SDF) to children's anterior primary teeth annually. Evaluation of the child's cooperation, adult happiness, and any adverse effects were secondary objectives. [(2)].

Methods:

This is a triple-blind, active-controlled, parallel-assigned randomised clinical trial with 1:1 allocation to 2 arms. On their six upper anterior teeth, the 688 three- four years old research subjects were randomly allocated to receive SDF or FV (a positive control). Using the index for decayed, missing, and filled surfaces, tooth-surface status was recorded. The child's cooperation was rated as "totally cooperative" or "not totally cooperative" by a trained observer. Researchers used a questionnaire to evaluate whether parents were "satisfied," "neutral," or "dissatisfied" with their child's oral health-related behaviours, such as bottle-feeding, snack consumption, and brushing habits. After treatment, adverse effects were assessed nearly 1 day and year later. Version 28.0 of SPSS was used to conduct the analysis.

Results:

Totally 434 children (SDF, n = 209; FV, n = 225) finished the study. The mean new decayed tooth surfaces developed for FV and SDF groups were 0.4 ± 1.3 and 0.4 ± 1.5 respectively (P = 0.65). The child cooperated 71% (244/344) and 70% (241/344) for SDF and FV therapy, respectively (P =0.89). Parents were 71% (148/209) and 69% (155/225) satisfied with SDF and FV therapy, respectively (P =0.29). For either treatment arm, adverse effects were not observed at 1 day or around 1 year after treatment.

Outcomes measure	SDF	FV
Primary outcome		
Caries incidence		
Mean new decayed surface (n = 434 children)	0.4 ± 1.5 (n = 209)	0.4 ± 1.3 (n = 225)
Odds ratio (95% CI) of decayed surface incidence (n = 10,071 tooth surfaces in total)	0.99 (0.59–1.64) (n = 4880)	1 (reference) (n = 5191)
Odds ratio (95% CI) of decayed surface incidence (n = 10,071 tooth surfaces, adjusted for baseline dmft)	1.15 (0.66–2.00) (n = 4880)	1 (reference) (n = 5191)
Secondary outcomes		
Child's cooperation (n = 688 children), No. (%)		
Children who were "totally cooperative"	244 (71%)	241 (70%)
Children who were "not totally cooperative"	100 (29%)	103 (30%)
Parent's satisfaction (n = 434 parents), No. (%)		
Parents who were "satisfied"	148 (71%)	155 (69%)
Parents who were "neutral"	59 (28%)	70 (31%)
Parents who were "dissatisfied"	2 (1%)	0 (0)
Short-term adverse effect (n = 688 children)		
1-day adverse effect, yes/no	0/344	0/344
Long-term adverse effect (n = 434 children)		
1-year adverse effect, yes/no	0/209	0/225

[#] Generalised estimating equations model for binary data with logit link function and exchangeable correlation.
[*] Mann–Whitney *U* test.
[+] Chi-square test.
SDF, silver diamine fluoride; FV, sodium fluoride varnish.

Outcomes of SDF and FV therapy on upper anterior teeth.

Discussion:

This 1-year study is the only reported clinical trial of a single SDF treatment on sound teeth for caries prevention. A single annual FV treatment served as the trial's positive control. The standard in caries prevention is FV varnish. On upper anterior teeth, there is no difference between SDF and FV in terms of the caries-preventive effect. In this study, SDF delivered an average of 4.75 mg F versus 9.31 mg F from FV to a child. Both SDF and FV therapies have a very low risk of dental fluorosis [(2)]. In a similar study, Iliana Gehui Yan et al concludes that FV applications contained twice as much fluoride as applications of 38% SDF [(3)].

The findings indicated that the majority of kids in both groups were completely cooperative. In a similar study Yon MJY et al which found high levels of positive and cooperative behaviour of children [(4)].

Conclusion:

At a 1-year follow-up, SDF is not more effective than FV at preventing caries in primary upper anterior teeth. At the 1-year follow-up, both the child's cooperation and the parent's satisfaction with SDF and FV therapy were very high. Both short-term and long-term adverse effects were not observed.

The sodium fluoride varnish is more effective than Silver diamine fluoride preventing caries in children with primary upper anterior teeth.

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A case report on the treatment of dental defects in a young child with familial intrahepatic cholestasis

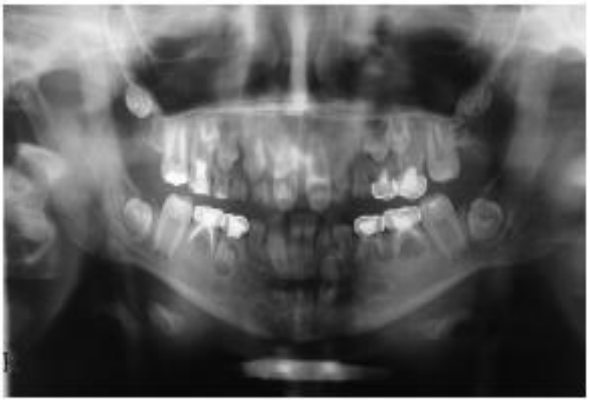
Introduction:

Progressive familial intrahepatic cholestasis (PFIC) is a heterogeneous collection of rare autosomal recessive paediatric liver disorders characterised by mutations in the genes encoding proteins involved in the hepatocellular transport system [(1)]. At the sixth week of development, human teeth can be seen developing. Dental abnormalities occur when a tooth's life cycle is inhibited for a wide range of causes. For instance, defects in the first and second phases of tooth development lead to fewer teeth than usual. Oligodontia is the term for having more than six missing teeth (not including the third molars). This is a case report from the medical and dental literature with type 3 progressive familial intrahepatic cholestasis together with concurrent oligodontia, craniosynostosis, dens in dente, taurodontism, and delayed permanent dentition [(2)].

Case Report:

A 9-year-old girl was presented with complaint of tooth pain due to severe caries and pulpal involvement. She was the only child of a consanguineous marriage. Her medical background included type 3 PFIC. Her liver function tests during her early years of life showed elevated levels of alanine transaminase (ALT), aspartate transaminase (AST), and gamma-glutamyltransferase (GGT). Her hepatic issues were treated with ursodeoxycholic acid, zinc sulphate, and vitamin E from a young age. She was born with a dolichocephalic skull pattern; as a result of fused sutures, she underwent craniosynostosis surgery at the age of 4 months. She also experienced a generalized tonic-clonic seizure at the age of 20 months, for which she was treated for two years with phenobarbital and diazepam. Before initiating dental procedures, appropriate laboratory tests were reviewed; all results were within normal ranges. On her right side, an intraoral examination revealed a buccal crossbite and an anterior open bite. In her permanent dentition, a dental and radiographic examination revealed 10 missing teeth, which is oligodontia. On a panoramic image, teeth #12, #22, #23, #35, #34, #32, #31, #41, #42, and #45 was missing. Between teeth #11 and #21, there was a 4-mm midline diastema, and the malformed crowns had pulp stones and dens invaginatus. The long-term treatment strategy for the patient included prosthetic and orthodontic treatments in addition to tooth implants. In the right upper region, tooth #16 received an amalgam restoration, tooth #55 experienced a pulpotomy procedure, and teeth #55 and #54 received composite resin restorations. Given the patient's elevated risk for caries, fluoride treatment, nutrition

modification, and improved dental hygiene were used as a preventive routine. A year later, the patient was returned to the clinic for collecting data, and post-treatment intraoral photographs and a panoramic radiograph were obtained. Fortunately, an intraoral evaluation at this time revealed no secondary/recurrent caries or infected lesions, and excellent oral care was still followed.

	
Pre-treatment panoramic radiograph	Post-treatment panoramic radiograph

Discussion:

Mutations in the PFIC group of autosomal recessive genetic disorders result in disorders of bile excretion. The clinical signs of intrahepatic cholestasis typically appear in childhood or adolescence and eventually result in liver failure. The three main types of PFIC are PFIC1, which results from a mutation in the ATP8B1 gene, PFIC2, which results from a mutation in the ABCBI1 gene that codes for the bile salt export pump protein, and PFIC3, which is caused on by a mutation in the ABCB4 gene that codes for MDR3[(3)]. Sadly, there are still no therapeutic regimens for PFIC patients that have been approved. Some off-label treatments for symptom relief include rifampicin, ursodeoxycholic acid (UDCA), cholestyramine, and fat-soluble vitamins. All children with PFIC should be left with the option of an initial UDCA therapy. Oligodontia has a complex etiology that is influenced by both environmental and genetic factors. Oligodontia is either a specific syndrome's symptomatic manifestation or a non-syndromic condition [(2)].

Conclusion:

The results of this study indicate that PFIC with symptoms like oligodontia, craniosynostosis, dens in dente, taurodontism, and delayed permanent dentition may be a sign of an undiagnosed syndrome; otherwise, the craniofacial anomalies are signs of a separate disorder that also

coexists with PFIC. Additionally, this is a good illustration of the significance of timely medical and dental attention in preventing additional health-related complications. After receiving the necessary dental care, the patient was able to eat and drink without experiencing any pain or discomfort.

PFIC (progressive familial intrahepatic cholestasis) symptoms such as oligodontia, craniosynostosis, dens in dente, taurodontia, and delayed permanent teeth might indicate an unknown syndrome.

Reference:

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