Cytokine Profile of Human Gingival Fibroblasts Following Exposure to Lipopolysaccharide and Zymosan Present in Cell Wall of Microorganism

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Abstract

Introduction

Background: Periodontal disease is a multifactorial disease that affects thousands, resulting in attachment loss and eventually tooth loss. The cause of periodontal tissue breakdown is the result of chemical and immune-mediated responses by cells stimulated by periodontal pathogens. By studying how the cell reacts to endotoxins (LPS) produced by bacteria and Zymosan obtained from fungi we can better understand the pathogenesis of periodontal disease.

Hypothesis: Exposure to either LPS and Zymosan will increase the production of cytokines synergistically as compared to exposure to LPS or Zymosan alone.

Methods: Human gingival fibroblasts (HGF-1) were exposed to: 1) LPS (10µg/mL) and/or 2) Zymosan (100µg/mL) or both LPS and Zymosan for 0, 6, and 12 hours intervals. Following exposure, the RNA was extracted and the cell supernatant was collected. Total protein concentration were quantitated using a BCA analysis. The Luminex Assay was conducted on the cells’ supernatant which was exposed at time intervals of 0, 6, and 12 hours.

Results: The level of eight various cytokines were evaluated after exposure to either LPS, Zymosan, or both LPS and Zymosan at different time intervals (0, 6, and 12 hours) in order to look for a synergistic relationship between the two different pathogen exposures.

Conclusions: It can be concluded that LPS and Zymosan produce either an additive or synergistic effect on the cytokine profile.

Acknowledgements

References

Case of Neuropathy from Parafunctional Habit

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Introduction

Neuropathic pain is a complex pain condition initiated by perturbation of the somatosensory nervous system due to lesion, injury or disease [1,2,5]. It may be related to either or both peripheral and central nervous system disorders [1,2,3,5]. Current estimates for neuropathic pain prevalence in the general population range from 6-8%, with 7% to 8% being most frequently cited in literature [1,2,4]. Prevalence estimates are expected to continue increasing due to aging populations, increased obesity rates, increased anxiety-related disorders, increased incidence of diabetes mellitus and improved survival outcomes of cancer patients post chemotherapy [1,4]. Neuropathic pain may be distinguished as spontaneous or evoked pain [1,2]. The pain may be accompanied by paresthesia, burning dysesthesia, anesthesia and weakness in associated areas [1,3].

Causes of Neuropathic Pain

- Trauma
- Stroke
- Amputation
- Chemotherapy
- Nerve compression
- Post-herpetic neuralgia
- Inflammatory disorders
- Autoimmune conditions
- Immunocompromising conditions

Common Causes of Orofacial Neuropathic Pain

- Atypical odontalgia
- Trigeminal neuralgia
- Burning mouth syndrome

Case

A 32-year-old Caucasian female presented to the clinic with the chief complaint of a chronic burning sensation localized to the anterior tip of her tongue and upper lip. Patient medical history disclosed hyperparathyroidism, type 2 diabetes mellitus, and mild obsessive-compulsive disorder. Patient medications were limited to methimazole and metformin at the time of initial consultation. Due to ageing populations, increased obesity rates, increased anxiety-related disorders, increased incidence of diabetes mellitus and improved survival outcomes of cancer patients post chemotherapy [1,4], neuropathic pain may be distinguished as spontaneous or evoked pain [1,2]. Neuropathic pain may be accompanied by paresthesia, burning dysesthesia, anesthesia and weakness in associated areas [1,3].

During the initial oral evaluation, no orofacial abnormalities or significant clinical findings were noted. Clinical photographs were obtained for documentation and further review of the patient’s oral condition. Due to the heightened magnification, the clinical photographs revealed no obvious tooth indentations or papilla bulging on the patient’s anterior tip of the tongue. These indentations were not clinically visible with the naked eye. Upon questioning, the patient initially denied any parafunctional habit that could be linked as the pain source. After being shown visual evidence from the clinical photographs, the patient then admitted to repetitively biting on the tongue tip and lips. A diagnosis of oral parafunctional habit causing self-inflicted wounds as the source of reported oral neuropathic pain was made.

Current research supports first-line pharmacological management of neuropathic pain with anti-epileptic medications and tricyclic antidepressants [1,2,4,9]. Topical medications such as lidocaine or capsaicin in patch form have also been successfully used in some instances [1,2,4,9]. One research study found that the use of a topical lubricant containing glycerin in carboxymethylcellulose (CMC) solution paired with control of oral parafunctional habit can aid as an initial treatment strategy for pain and sensations associated with Burning Mouth Syndrome [21]. Little success has been documented in using non-steroidal anti-inflammatory drugs (NSAIDs) to manage neuropathic pain [1], and opioids have weak recommendation for use due to the long-term side-effects and potential addiction risk associated with these [1,2,9]. Other research includes non-pharmacological neuropathic pain management with occlusal splint therapy and behavior modification through self-adjustment or counseling [7,10,11]. There is a substantial consensus throughout available research on the need to also consider and address psychogenic factors when treating neuropathic pain, as stress and personality may participate in individual pain presentations.

Behavior modification was the recommended method of treatment. It included a cessation alarm on mobile device timed for every half-hour and a mandibular occlusal splint to aid with controlling the parafunctional habit. At a six-week follow-up, the patient reported a 40% to 50% improvement in symptoms which she attributed to the treatment recommendations. At a subsequent follow-up scheduled twelve-weeks from the initial follow-up, the patient reported her pain absent, although tongue indentations remained present. The patient was discharged from the clinic and recommended follow-up as needed.

Discussion

Parafuctional habit as an etiology for neuropathic oral pain should be considered when:

- There is no clear pathology evident
- There is no other apparent cause for pain

Tools for diagnosis of neuropathic oral pain include:

- Examination
- Imaging
- Neurophysiological testing
- Laboratory investigation
- Clinical photographs

This case shows that signs of trauma may be so discreet that it may be clinically visible. Taking photographs gives an opportunity to examine magnified images of the affected area(s) and has the ability of aiding diagnosis. It is advisable to determine if parafunctional habit is the cause of discomfort prior to giving any definitive or irreversible treatments.

Conclusions

References

Understanding the effects of Arrabidaea chica extract on inflammatory signaling pathways

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Abstract

Arrabidaea chica extract inhibits the expression of the pro-inflammatory cytokines IL-6, IL-8, MIP-1β, SDF-1α, and IFN-γ in human gingival fibroblast cells that were exposed to the PAMPs Lipopolysaccharide and/or Zymosan.

Conclusions

- Future directions for this work include: performing ELISA to assay specific cytokine expression, performing RT-PCR to understand the post-exposure transcriptome, and performing Western Blots to understand the pre-transcription proteome.

References


Acknowledgements

The authors would like to thank the ECU School of Dental Medicine for its ongoing support of the Summer Scholars Research Program and this research endeavor.

Introduction

Oral mucositis is the painful inflammation and ulceration of oral tissues as a common side-effect of aggressive cancer therapies such as radiotherapy or chemotherapy. Currently, there is no available treatment or cure for the disease. Recently, a highly bioactive extract from Arrabidaea chica, popularly known as Crajiru, was isolated. This naturally occurring substance markedly reduced inflammation and skin infections in animal models and clinical trials.² We hypothesize that A. chica will inhibit the expression of pro-inflammatory cytokines.

Methods

Multiplex ELISA was performed on the collected supernatants using the Luminex system. Cytokine analytes included: CCL4/MIP-1α, CXCL11/ITAC-1, IFN-gamma, IL-10, IL-6, CXCL9/MIG, CXCL12/SDF-1 alpha, CD40 Ligand, IFN-beta, IL-1 beta, IL-12/23 p40, CXCL8/IL-8, CCL3/MIP-1 alpha, TNF-alpha, and CCL5/RANTES. RT-PCR experiments were conducted using the RNA collected with the following cytokine primers: CXCL9, IFNB1, IFNG, IFNA16, CXCL11, CD40, TNF, CCL5, CCL3, and CCL4.

Results

Fig. 1. IL-8 levels after LPS exposure. The authors would like to thank the ECU School of Dental Medicine for its ongoing support of the Summer Scholars Research Program and the availability of resources to support this study. We appreciate the efforts of the ECU School of Dental Medicine for its ongoing support of the Summer Scholars Research Program.

References


Acknowledgements

The authors would like to thank the ECU School of Dental Medicine for its ongoing support of the Summer Scholars Research Program and this research endeavor.
Abstract

Saliva has the potential to be a convenient, noninvasive, and comprehensive tool in evaluating the overall health of the body. As a result, further studies are needed to identify and develop a wide array of methods to detect salivary biomarkers. These findings suggest that HNE is a viable salivary biomarker for lipid peroxidation in stimulated and unstimulated saliva of healthy volunteers.

Methods

Patients were recruited verbally and through flyer as healthy volunteers and informed consent obtained. Dr. Gordon performed oral evaluation.

Results

4-hydroxy-2-nonenal (HNE) is a viable salivary biomarker for lipid peroxidation. HNE levels in stimulated saliva may be lower than unstimulated because there is an increase in the total volume of saliva produced, thereby diluting the concentration of HNE in saliva samples. Unstimulated saliva may have a greater variability because it reflects a more accurate oxidative state of each subject.

Conclusion

Future Directions

The presence of HNE in stimulated and unstimulated saliva of healthy volunteers provides a noninvasive method of evaluating oxidative stress.

• Saliva is a noninvasive matrix for the detection of oxidative stress.

• Saliva markers of oxidative stress can be used for screening and monitoring of oral diseases such as periodontitis or cancer.

• Saliva markers of oxidative stress can be used as a noninvasive surrogate of oxidative stress.

• Saliva markers of oxidative stress can be used as a non-invasive tool for the diagnosis of various chronic diseases.

Fig. 1. Formations of some temporary, unstable intermediate confirmations (Green & Gold) on the pathways from linoleic acid (C18:2) to HNE.

References


Influence of Maternal Diet and Physical Activity on Dental Maturity and Caries Occurrence in Offspring

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Abstract

Background: The in utero environment provided by the mother during pregnancy influences the development of the fetus. Our previous findings demonstrate a statistical increase in tooth maturity and development as a function of the child’s age related to maternal physical activity (PA) during pregnancy. In addition, nutrition while pregnant, especially foods high in anti-inflammatory fatty acids (PUFA) has been associated with differences in child tooth development. It is unknown how maternal PA and nutrition during pregnancy impact the development of teeth of offspring. A secondary objective is to determine the influence of diet and exercise during pregnancy on dentitions of children.

Method: Mothers with scleroderma, a rare and young, who are patients of the ECU Pediatric Dental Clinic were recruited to participate in this study. Maternal intake during the pregnancy was recorded through use of a Food Frequency Questionnaire. Based on the response to the FFQ questionnaire related to the pregnancy, women were classified as exercisers, active, or control during their pregnancy. During these exams, Decayed, Missing, and Filled Teeth were recorded. A total primary dentition count was taken in addition to a Caries Risk Assessment being recorded during the exam (AFPI). We utilized multiple ANOVAs and correlations to determine differences and associations of variables between groups, respectively. Regression were used to determine which factor(s) was the best predictor of Death maturity of children.

Results: There were no differences in foods high in PUFA between groups and there were no significant associations between AFPI score during pregnancy and child tooth health and development. The greatest predictor of tooth maturity was maternal exercise.

Conclusions: In this study, maternal exercise during pregnancy is a stronger influence of child oral health outcomes. All healthcare providers seeing pregnant women should counsel them on the importance of PA during their pregnancy.

Introduction

• Teeth begin forming in utero, but finish after delivery.
• Maturation of teeth depends on: • The number of teeth that have erupted.
• Enamel integrity (organization and mineralization).
• Individuals whose dentition mature at a regular pace are at less risk of developing dental caries.
• The nutrient DHA, docosahexaenoic acid, is an essential polyunsaturated fatty acid (PUFA), important to the development of an infant.
• DHA, an Omega-3 fatty acid, has anti-inflammatory properties.
• A study by Choi et al. showed that omega fatty acids have high antimicrobial activity against pathogens that cause gingivitis.
• A randomized clinical trial was done that showed supplementing lactating mothers with n-3 long chain fatty acids lead to a monthly increase in growth of their children.

Question 1: Does prenatal exposure to physical activity and omega-3 fatty acid intake affect the dental maturity of children?

Hypothesis 1: Mothers who exercised during pregnancy and consumed foods high in omega-3 fatty acids at least 1-3 times a week, have children with less dental caries than mothers who did not exercise and consumed lower amounts of omega-3 foods.

Question 2: Does prenatal exposure to physical activity and omega-3 fatty acid intake affect the dental maturity of children?

Hypothesis 2: Individuals whose dentition mature at a regular pace are at less risk of developing dental caries.

Methods

Inclusion Criteria • Child ≤6 years at consent • Child is a patient at ECU School of Dental Medicine Pediatric Clinic

Maternal Questionnaires • Modifiable Physical Activity Questionnaire—calculates level of METmin/wk • Food Frequency Questionnaire • Quantitative scale • 1: never/rarely eat → 5: eat more than once a day • Fish/Seafood, PUFA fats, Sunflower oil, and almond milk

Child Oral Measurements • Routine dental examination with dental providers • Decayed, Missing, and Filled Surfaces (DMFS) count • Decayed, Missing, and Filled Teeth (DMFT) count • Caries Risk Assessment (AAPA) • Periodontal Risk • Low, Moderate, and High risk • based on Biological, Protective, and Clinical Findings • Total mixed dentition count

Table 1. Maternal Participant Demographics. No statistical difference between groups for Age, weight, or BMI. There are trends for those who are active or exercisers to be leaner.

Table 2. Child Participant Demographics. No statistical difference between groups for age, weight, and BMI.

Table 3: Maternal Nutrition. There are trends between groups showing significant but weak associations (DMFT, DMFS, caries risk). Caries risk makes it even more important for dental care providers to encourage the consumption of PUFA-rich foods during pregnancy and to educate women about their child’s oral health.

Conclusion

We hypothesized that women who exercised during pregnancy and consumed foods high in PUFA, have children with improved dental maturity and decreased caries risk relative to children of mothers who did not exercise and consumed less PUFA-rich foods.

• maternal exercise and PUFA consumption during pregnancy is associated with child dental maturity.

The greatest predictor of Child dental health measures is PUFA consumption during pregnancy. A greater predictor of decreased caries risk is maternal education.

Overall, these results suggest exercise during pregnancy improves offspring dental maturity, which makes it even more important for dental care providers to encourage the consumption of PUFA-rich foods during pregnancy and to educate women about their child’s oral health.

References


Qualitative Analysis of Attitudes and Barriers to Oral Health Care as Perceived by Psychiatric Patients and Dental Providers

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Abstract

Background: Mental Illness (MI) correlates with poor oral health outcomes. Objective: To assess the attitudes and experiences of dental faculty and psychiatric patients in relation to patients with MI and examine the barriers psychiatric patients face to oral health care. Methods: Dental faculty at the ECU SoDM and patients of the ECU Psychiatry Outpatient Center were interviewed and their responses were thematically coded. Results: All of the barriers reported by the psychiatric patients were consistent with the barriers to oral health care mentioned by the dental providers, with the exception of feelings of embarrassment caused by poor oral health status. Conclusion: More interdisciplinary communication and training is needed to ensure patient’s mental and oral health are effectively treated.

Methods

Recruitment and Interviews (June-July 2018)

- The dental faculty participants were identified using purposeful sampling and recruited at the ECU SoDM.
- The psychiatric patients were recruited at the ECU Psychiatry Outpatient Center through the use of study fliers.
- Participating dental faculty (n=25) and psychiatric patients (n=20) underwent a 15-minute semi-structured interview.
- Interviews were recorded, transcribed, and the coded using inductive themes for attitudes and barriers towards treatment of patients with MI.
- Qualitative research software used was Nvivo 11.

Table 1: Key themes from the dental faculty interviews (n=25)

<table>
<thead>
<tr>
<th>Key Themes</th>
<th>Supporting Quotes</th>
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<tbody>
<tr>
<td>Need for interprofessional collaboration</td>
<td>&quot;And I think it’s a key component to your education, is educating dentists on all aspects of taking care of patients from a multidisciplinary role. And multidisciplinary, I don’t mean disciplinary in endo and prost and peri, I mean, multidisciplinary as in mental health and general practitioners, physicians. It’s got to be part of a health team.&quot; - Participant 005</td>
</tr>
<tr>
<td>Additional training and educational initiatives</td>
<td>&quot;Not as far as doing dentistry. The skills that they need to improve are patient evaluation and really making sure they know how to do the anxiety reduction protocols. What to do when a patient has severe anxiety. It’s more the medical side of things that a lot of times they don’t, a general dentist and a lot of dentists out there, don’t retain in their memory banks from school.&quot; - Participant 002</td>
</tr>
<tr>
<td>Barriers to oral health care</td>
<td>&quot;I think one of the biggest concerns is a lot of them don’t have a healthcare advocate or someone to look out for them, and so they kind of get lost sometimes. And with their inability to remember or schedule or their fears, they have a no-show rate.&quot; - Participant 007</td>
</tr>
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Table 2: Key barriers reported from the patient interviews (n=20)

<table>
<thead>
<tr>
<th>Key Barriers</th>
<th>Supporting Quotes</th>
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<tbody>
<tr>
<td>Socioeconomic limitations</td>
<td>&quot;It’s expensive to go to the dentist, and I didn’t have health insurance, and it didn’t cover -- any time I would get health insurance, it would never really last long enough, cause I’d end up having to switch jobs and then my coverage would be taken out.&quot; - Participant F</td>
</tr>
<tr>
<td>Dental fear/anxiety</td>
<td>&quot;Well, I think they kind of feel like it’s not like a legitimate, like your fear is not legitimate. If it doesn’t hurt, then it’s not a problem but it doesn’t have anything to do with pain. It shouldn’t hurt. If it hurts, you’re a terrible dentist. Anxiety doesn’t have anything to do with pain.&quot; - Participant B</td>
</tr>
<tr>
<td>Embarrassment</td>
<td>&quot;I went -- now I currently have a different dentist now and I love him dearly, he’s wonderful. He’s very caring and very sensitive. But the dentist that I went to when I got my teeth pulled out made me feel embarrassed... I mean, I know it’s a dentist office and they have a job to do and stuff like that, but you want to feel somewhat comfortable, you know?&quot; - Participant G</td>
</tr>
<tr>
<td>Lack of motivation</td>
<td>&quot;Certainly I have been too depressed to get out of bed, too depressed to brush, too depressed to brush for a week when I was homeless. I remember I actually went for one week and I was worried about that but I was too depressed to do anything about it.&quot; - Participant A</td>
</tr>
</tbody>
</table>

Discussion/Conclusions

- Our findings highlight the need to address the barriers inhibiting the patient population with MI from seeking dental treatment.
- Socioeconomic limitations and dental fear/anxiety were leading causes of dental appointment avoidance as reported by both groups of participants.
- Embarrassment caused by poor teeth was a barrier that the dental faculty did not mention during the interviews.
- Despite results from past studies, none of the psychiatric patients in this study felt judged by their current or past dentists due to their MI.
- Communication between the dental faculty and psychiatrists was rarely reported, showcasing the need for more interdisciplinary communication between current dentists and psychiatrists.

Limitations

- Did not clearly define the range of mental health conditions to the participants.
- Only psychiatric patients with well-controlled symptoms volunteered to be interviewed for the study (self-selection bias).
- Response bias.

Future Research

- Examine the attitudes and clinical experiences of dentists currently in private practice in relation to treating patients with mental health conditions.
- Assess the effectiveness of ECU SoDM in reducing the number of dental related visits to local hospital-based emergency departments made by patients diagnosed with MI.

Acknowledgements

We would like to thank the ECU SoDM Summer Scholars Research Program and the staff of the ECU Psychiatry Outpatient Center for their support with this project.

The study was reviewed and approved by the East Carolina University & Medical Center Institutional Review Board. IRB # 17-001654

References

Abstract

Background: Determining the best option for treatment of dental caries in primary teeth in pre-cooperative children is a multifactorial, and often, difficult decision for both parents and practitioners.

Objective: This study investigated parental esthetic preferences between options of no treatment, treatment with silver diamine fluoride (SDF), and treatment under general anesthesia (GA) for primary anterior teeth.

Methods: 78 parents/guardians of pediatric dental patients completed questionnaires reporting demographic information, as well as ranked their choices of the aforementioned treatment options after reviewing the risks and benefits of each. Data analysis was completed using SPSS software.

Results: There was no statistically significant difference in the parents’ preferences based on age, sex, or ethnicity. The parents’ choice in rank order from most preferred to least preferred was as follows: treatment in the operating room under GA (58%), treatment with SDF (34%), and no treatment (8%).

Conclusions: This study revealed that treatment under general anesthesia in the operating room was mainly viewed favorably by parents and is the parental majority’s preferred option over SDF and no treatment for caries in primary anterior teeth.

Introduction

-42% of children ages 2-11 years old have active carious lesions. [1]

-Caretakers have been increasingly choosing the option of dental treatment under general anesthesia for their children over the last couple of decades, even over less invasive options. [2,3]

-SDF is a simple, low cost, low risk intervention for arresting carious lesions that could buy time for a pre-cooperative child to later be treated safely with non-pharmacological behavior management techniques. [4]

-The dark staining of carious enamel and dentin by SDF may be undesirable to desirable. [5,6,7]

-In a 2016 survey of pediatric dentistry program directors, the most frequent perceived barrier to the use of SDF was parental acceptance (91.8%). [5, 6]

Methods

Hypothesis: Parents of children presenting to ECU SODM’s Pediatric Dental Clinic would prefer more esthetically pleasing treatment options in the primary anterior teeth, regardless of associated risks.

Study Design: Survey/questionnaire comprised of demographic information and employed a 3 point pictorial with written rank orders and 10-point Likert scale for responses: undesirable to desirable.

Sample: A convenience sample of 78 parents/caretakers of pediatric dental patients.

Data Analysis: Data was abstracted and evaluated with regards to treatment preferences and these preferences were compared considering the parents’ age, sex, and race.

Results

-A total of 78 questionnaires were completed.

-The respondents were 85.9% (n=67) female and 14.1% (n=11) were male. 43.6% (n=34) of the respondents were African American, 43.6% (n=34) were Caucasian, 7.7% (n=6) were Hispanic/Latino, and 5.2% (n=4) were some combination of the aforementioned ethnicities.

-75% (n=58) of the respondents were between the ages of 22-25 years, with the average age being 39 years.

-Of the 78 individuals surveyed, 58% (n=43) preferred dental treatment under general anesthesia, 34% (n=25) preferred treatment with SDF, and 8% (n=6) preferred no treatment for the primary anterior teeth.

-43% (n=32) of respondents selected treatment under general anesthesia as the most desirable on the Likert scale. Additionally, 13% (n=10) chose treatment with SDF and 10% (n=8) chose no treatment as the most desirable options on the Likert scale.

-Therefore, both the rank order and Likert scales revealed parent/guardian’s choices listed in order from most to least preferred as Treatment under general anesthesia, treatment with SDF, and no treatment.

-A chi square analysis showed no significant association between treatment preferences and these preferences were compared considering the parents’ age, sex, and ethnicity.

Conclusions

-Dental care providers tend to assume that patients and parents will demand the most esthetically pleasing options. This is evidenced by provider trends from alloys and stainless steel crowns towards resins and Zirconia crowns.

-For pre-cooperative patients or patients who are otherwise unable to tolerate treatment, SDF provides a suitable alternative to delay definitive treatment for a time.

-Investigators of a 2016 study found that, over the past few decades, the hierarchy of parental attitudes towards acceptance of advanced behavior management guidance techniques has changed, with increasing approval of pharmacological management. [10]

-In a 2017 study, investigators found that parents were more willing to accept SDF, especially when traditional behavior management techniques were not possible and the child would need pharmacologic management. They found parental acceptance of SDF to be higher in the posterior than the anterior dentition. [5]

-Our results were more congruent with the 2016 study referenced above.

References

Chemotherapy-Induced Oral Hyperpigmentation

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Introduction

- Many side effects are associated with chemotherapy treatment
- Oral side effects may range from mild taste disturbances to painful mucositis [1]
- Mucosal hyperpigmentation is difficult to diagnose due to variety of conditions with similar clinical appearance
- Racial pigmentation is usually observed in dark-skinned populations [3]. This type of pigmentation ranges in color and location within the oral cavity. Color changes range from light to dark brown and is most commonly located within the gingiva and buccal mucosa. Other reported sites include lips, palate, and tongue [7]
- Pigmentation-causing drugs [4]
  - Hormones
  - Oral contraceptives
  - Anti-anxiety
  - Anti-malarial
  - Anti-fungal
  - Anti-microbial
  - Chemotherapeutics
- Sites commonly affected by chemotherapy-induced hyperpigmentation
  - Palate and gingiva are the most common sites affected, but also can be seen on the skin, mucous membranes and tongue [2]
- Hyperpigmentation on the tongue may appear as soon as 1 to 2 chemotherapy doses into treatment
- May begin to fade between weeks to months after treatment completion but can remain a long term or permanent side-effect [6]

Case Presentation

- 58-year-old African American female experiencing localized gum bleeding during brushing as well as hyperpigmentation on the tongue
- Patient’s current medical status: hypercholesterolemia, diabetes, irritable bowel syndrome, and dissociative identity disorder
- Medication regimen: simvastatin and metformin
- Past medical history: breast cancer with surgical history of C-section and modified radical mastectomy
- Cyclophosphamide was the chemotherapeutic drug used to treat her breast cancer
- Previously diagnosed by former dentist as racial pigmentation

Discussion

- Currently, the only known adverse side-effect of oral hyperpigmentation is poor aesthetics.
- Removal of oral hyperpigmentation involves relatively invasive treatments [5]
- Mechanism driving oral hyperpigmentation with chemotherapy remains unknown
- Proposed mechanisms include accumulation of drug or drug metabolite deposition in oral mucosa, enhanced melanin deposition with or without an increase in melanocytes, or drug-induced post-inflammatory changes [4]

Conclusions

- Chemotherapy is often the first line of defense against many types of cancer
- With a rise in cancer cases and chemotherapy use, dentists are likely to encounter patients with oral complications as a result of chemotherapy
- Based on current knowledge, this is a benign condition that does not significantly impact a patient’s overall health or quality of life
- Correct diagnosis will avoid patient concern and unnecessary biopsies
- Dentists should have the knowledge and expertise to diagnose and monitor chemotherapy-induced oral hyperpigmentation

References

Abstract

Background: Adolescence can represent a period of vulnerability.1,2,9 These young adults in an effort to become more independent in thought and action may become susceptible to peer pressure. As a result, they may engage in riskier behavior like using tobacco or alcohol. As these choices are being made by the young person, it is important that they are being properly educated on the impact these choices can have on their health. This is a time when the dental provider must be vigilant in maintaining continuity of care and remembering that this population needs care just as much as adults and young children.

Objective: The goal of this research was to understand how the directors of U.S. advanced pediatric residency programs are managing their adolescent patient population.

Methods: A survey was composed of 17 questions and distributed by email through SurveyMonkey.com to all Program Directors of the United States.

Results: Ages 0-9 years of age make up 51% to 75% of the patient population for 88% of respondents. Smoking prevention, TMJ disorders, substance abuse, injury of prevention and use of bleaching agents were not always addressed with adolescents. The issue of tobacco and substance abuse were more often addressed at ages 13-15 followed by ages 10-12. Of those who addressed substance abuse, most will make a referral for treatment. Regarding transitioning, dental and chronological age, behavior, special needs and oral health maturity were all factors of consideration. Most felt that adolescents should be referred by ages 17-19 followed by ages 14-16 and then 11-13. The majority of respondents felt that adolescent dental clinics are needed in dental schools.

Methods

• Adolescent age was defined as 10-18 years of age.
• Survey was composed of 17 questions addressing demographics, oral health recommendations, tobacco and substance abuse, and the transitioning of the adolescent patient to an adult dental home.
• Distributed by email through SurveyMonkey.com to all Program Directors of the advanced Pediatric Dentistry programs in the United States (N=105) and they were given 6 weeks to respond
• Data analysis was completed using the SPSS statistical program, Version 25.

Results

Demographics of Respondents: Response rate was 14% (N=15) Majority of respondents reside in the Northeastern districts, were trained and currently teach in a hospital based program. Patients 0-9 ages of year made up 51-75% of patient populations for 88% of respondents. Majority of patient populations was Medicaid.

Managing Adolescent Populations: All respondents addressed the use of Fluoride, OHI, Sealants, Rest. Dentistry, Tx of Malocclusions, congenitally missing teeth, ectopically erupted teeth, and Diet. Most addressed substance abuse and will refer for treatment when abuse is discovered.

Transitioning of Adolescent Patients: Most programs focus on transitioning from the pediatric to general dentist. When transitioning patients most said age, dental age, behavior, special needs, other family members in the practice, and oral hygiene maturity are factors. Most agreed that pediatric dentist should no longer accept new patients between age 17-19 years. Majority surveyed agreed that adolescent clinics are needed in Dental Schools.

References


Conclusion

Our study used a survey that examined several different patient management aspects as well as the characteristics of the programs. The survey consisted of three sections. The first considered the demographics of the programs and of the patients being treated. The second looked at common treatment needs and issues being faced by adolescents to determine if the programs are managing them. Lastly, the programs transitional determinants of the adolescent population from a pediatric to general dentist were evaluated.

Findings:

• Demographics could not be used to determine which programs are more inclined to treat adolescent populations.
• The majority of health recommendations in our survey are routinely addressed, those that were not included treatment of Perio and TMJ disorders, substance abuse, injury and smoking prevention, and use of bleaching materials.
• Programs are focusing on the transitioning of these patients and likely training their residents to use certain criteria to do so as well.

Limitations:

• Low response rate
• Selective population
• Adolescent age group not strongly represented in the programs surveyed

Future Directions:

• More research on General and Pediatric dentists
• Survey to adolescents and parents
Abstract

Background: Learning style is defined as the composite characteristic cognitive, affective, and physiological character that serves indicators of how a learner perceives1-2. Learning styles is widely used to describe how individuals gather, sift through, interpret, organize, and retain information for further use3. Each individual has a unique way to learn and process information. Individuals are born with certain tendencies towards a particular style, which could be influence by different factors4. The VAK (Visual, Auditory, or Kinesthetic) learning Style Model was developed by psychologists in the 1920’s to classify the most common ways that people learn.

Objective: The study has been carried out on dental students’ to determine their dominant learning styles (Visual, Auditory, or Kinesthetic) or possible multimodal styles based on Kolb theory in East Carolina University School of Dental Medicine.

Methods: The VAK Kolb questionnaire is being administer to undergraduate students in second, third, and fourth years to determine their learning styles preference and a possibility of multimodal learning ability. Additional information that will be gather, includes: age, ethnicity, gender, and current dental school year. The information obtained will be analyzed using descriptive statistics to summarize data frequency or measures of central tendency (such as mean, median, and mode).

Results: Survey had a response rate of 14.7 percent (22 of 150 dental students). Results revealed that the most common learning style was visual (38%), kinesthetic (31%), and auditory (31%).

Conclusions: Our preliminary data shows that dental students learning preference is visual, follow by kinesthetic and auditory modalities.

Methods

Hypothesis: The hypotheses formulated for the study are the following:

There will be a slight difference on the learning styles of students correlated on the current year the students is matriculated.

There will be no significant difference between the learning style, age, and gender.

Study Design:

• Quantitative Study

Sample:

Survey sample of dental students (N=150) from ECU SoDM

• Response rate was 14.7% (n=24)

• 2 surveys were incomplete, therefore excluded.

Descriptive Analysis: Survey categorized students as 2nd, 3rd, or 4th Year Dental Students and de-identified by survey.

• 2nd Year Dental Students (n=8)

• 3rd Year Dental Students (n=6)

• 4th Year Dental Students (n=7)

Results

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Race/Ethnicity</td>
<td>Age</td>
</tr>
<tr>
<td>Gender</td>
<td>Learning Styles Preference</td>
</tr>
</tbody>
</table>

Discussion

• Preliminary results revealed that dental students at ECU SoDM preferred learning style are as follow: 38% Visual, 31% Kinesthetic, and 31% Auditory.

• As dental students progress through multiple academic years in dental school, instructions shifts from mainly didactic-focused teaching to increased reliance on practical and hands-on training in simulation laboratory and clinics, which may affect the dental students learning style preference.

• Once the results are finalize and determine the best learning styles for each individual year of dental school, the information can assist faculty members to better incorporate the teaching techniques to match the learning styles of dental students.

Conclusions

• The majority of the dental students at ECU SoDM as a cohort were found to have 38% visual learning style preference, and 31% kinesthetic and auditory.

• Faculty members should attempt to tailor their teaching style delivery to accommodate the styles of their students.

References


