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Exploring the relationship between childhood adversity and oral health: An anecdotal approach and integrative view

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ABSTRACT

During the past two decades, increasing recognition has been given to a relationship between oral health and systemic diseases. Associated systemic conditions include cardiovascular disease, diabetes, low birth weight and preterm births, respiratory diseases, rheumatoid arthritis, obesity, osteoporosis, and, in particular among oral conditions, periodontal disease. Low-grade inflammation is a common denominator linking these disorders. Applying an anecdotal approach and an integrative view, the medical and dental histories of two women document increasing ill health subsequent to incidences of maltreatment and sexual abuse, including oral penetration, at an early age. Comprehensive oral rehabilitation was required in both cases. These cases open for medical insight with regard to their implicit patho-physiology, when integrated with current evidence from neuroscience, endocrinology, and immunology, converging in the concepts of allostasis and allostatic load. In cases such as those presented in this paper, primary care physicians (family doctors, General Practitioners) and dentists may be the first to identify an etiological pattern. This report underlines the importance of increased and enhanced multidisciplinary research cooperation among health professionals. Our hypothesis is that childhood adversity may affect all aspects of human health, including adult oral health.

Introduction

In the Journal of Oral Microbiology, Editor-in-Chief Ingar Olsen addressed a solidly documented clustering of oral infections and systemic disorders [1]. Associated systemic disorders included cardiovascular diseases [2], diabetes [3], low birth weight and preterm births [4], respiratory diseases [5], rheumatoid arthritis [6], obesity [7], as well as several other conditions, including osteoporosis [8]. The most frequently associated oral condition was periodontal disease. The strong correlations between cardiovascular diseases and, in particular, periodontal disease have already sparked a bilateral consensus between dentists and cardiologists [9] suggesting that screening to assess the risk of systemic illnesses such as cardiovascular disease (CVD) and type-2 diabetes be integrated into routine periodontal examinations [10]. Studies examining the relationship between periodontal disease and adverse pregnancy outcomes have demonstrated, however, that even comprehensive dental treatment interventions during pregnancy failed to lower those correlated risks [11].

Authors agree that these correlations are both solid and indisputable. They admit, however, that evidence of causality remains weak. No explanations are offered to account for why these diseases, traditionally conceptualized both as distinguishable from one another and as belonging to different taxonomies, not only seem to cluster into recognizable patterns but also to be characterized by parallel social gradients [12–14]. Reference is made, however, to a "common denominator," namely inflammation. Yet, no answer is provided to the question of what etiology might influence this "common ground" of systemic low-grade inflammations. Such complex relationships as those implicit in the documented correlations between periodontal disease and other diseases would indicate either the need for a change in focus [15], or, rather, a more fruitful framework on which to base further exploration and understanding.

Thus, instead of approaching this inquiry strictly empirically, we extract from and condense the most current epidemiological evidence regarding the connections between biological and biographical phenomena [16], both from a range of clinical specialties and from the latest research within the neurosciences. These concepts will be illustrated using case histories in order to reframe

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current knowledge to focus on the lived body, that is, on the impact that embodied lifetime experiences have on health [17,18].

The hypothesis

Homeostasis, allostasis, and allostatic load

Applying models of homeostasis, health is traditionally defined as a state in which all physiological parameters operate within a given norm [19]. A different definition emerges, however, if one's point of departure is the dynamic concept of allostasis. A Greek word, 'allostasis' means 'stability through change.' Allostasis thus denotes the body's adaptation to any given situation or context [20]. Allostatic load, as applied here, refers to the accumulated impact on the body of repeated allostatic responses to situations which are, or are perceived of as being, dangerous, that is, as being threatening to homeostasis [21]. These types of stressors trigger the release of catecholamines, in an interaction between the autonomous nervous system and the adrenocortex (SAM-axis). Simultaneously, the hypothalamus/pituitary gland/adrenocortex-axis (HAP-axis) is activated, resulting in a release of cortisol and other stress-related hormones [22]. The allostatic load model traces the sequence of how chronic *overload* on the SAM and HPA-axes engenders disease [23]. The chronic distress brought on by burdensome life experiences may, in turn, provoke complex illness and/or chronic disease. Distress of this kind may be inherent in such experiences as an unfair workload, unemployment, economic strain, loss of close relatives, breakdown of relationships, exposure to violence, torture or displacement as a result of war, and maltreatment, abuse or neglect during childhood. Such experiences trigger mental and physical processes which impact on the immune, hormonal and central nervous systems alike [24–31].

Allostatic load – a relevant topic for dentists?

As an example of a chronic, systemic illness, periodontitis is a multifaceted and tissue-destroying disease that is associated with genetic, immunological, and bacterial factors. Based on comprehensive research, periodontal disease may be seen as resulting from a disturbed interplay of the brain and neuro-hormones, compromising the immune system's adaptive capacity to respond optimally to pathogenic oral bacteria [32]. Dentists, especially those treating children, disabled people and adults experiencing chronic oral or mandibular pain, have become increasingly aware that dental fear and orofacial pain are often indicators of wider health problems [33]. Chronic oral diseases may also be related to, or be the result of, maltreatment, abuse or neglect during childhood, adolescence or during adult life. [34,35]. Abuse and maltreatment can, in fact, impact all aspects of health [36], including oral health [37], as illustrated by the following case.

A woman whom we have named Judith Jansson was raped at 11 years of age by a male neighbor. Throughout the next year, the man provided his friends with frequent opportunities to abuse the girl through forced oral penetration. At the age of 12, she was admitted to a hospital suffering from severe abdominal pain, jaundice and pancreatitis. The surgeons concluded that the cause was a gall-stone and decided to perform a cholecystectomy. The intervention did not relieve her abdominal pain, which continued unabated into adulthood. While still a teenager, the condition of her teeth deteriorated and she developed severe dental fear. Learning to swim became impossible and even showering could pose a threat as she was particularly afraid of water – or anything else – "running over my mouth." At age 15, she attempted suicide and was admitted to a psychiatric unit. Also, she developed asthma and was diagnosed with anxiety disorder. Decades later, the woman came to understand that her "asthma" was triggered by the fear of being suffocated by having something big in her mouth. Her attacks of anxiety were always accompanied by nausea, which very often led to vomiting. While still a teenager, she developed serious eating disorders. Since she experienced that she could sometimes control both her nausea and her vomiting by eating, she soon became grossly overweight. Later, she also realized that she could actually control both her abdominal pain and her eating problems by avoiding all foods with a shape, color, smell, consistency or taste that reminded her of a penis or of semen. After such massive oral abuse, and given the effects which that had indelibly inscribed on her body, her self-perception demanded that she draw a distinct line between her and what she had been forced to endure. Beginning in early adulthood, she abused alcohol and, on several occasions, was involuntarily committed to a psychiatric unit. There, she was medicated with various psychotropic drugs and, once, tried to hang herself. Her bad teeth caused a variety of eating problems and much oral pain. The expense of innumerable dental interventions, including implantations, forced her to go into debt. Now in her early sixties, she suffers from type-2 diabetes, hypertension, hyperlipemia, atopic eczema and arthritic pain. She has always dissociated when receiving medical or dental treatment. She has only recently found the courage to request of her doctors that they, "Talk to me so I can bear to be present."[1]

Allostatic load – a shared topic for dentists, cardiologists and obstetricians?

The previous history exemplifies a much debated cluster of health problems, namely that of CVD and periodontal disease [14]. An earlier hypothesis of the direct transfer of oral bacteria to cardiac tissue has been invalidated. However, CVD and periodontal disease share the common denominator of systemic inflammation, which also links periodontal disease to preeclampsia, a condition resulting in low birth weight and preterm births [38–41]. Documentation of an increased risk of preeclampsia among pregnant women suffering from periodontal disease has generated many studies measuring the outcome of dental treatment in relations to its impact on premature delivery, infants born alive, and low birth weight for gestational age. Researchers have concluded that, while it is safe to treat periodontitis during pregnancy, doing so does not contribute significantly to reducing the risk of low birth weight or preterm births. Michalowitcz and colleagues' findings [39] were supported by Offenbacher and colleagues in a review of all treatment studies of pregnant women with various oral diseases [41], as well as through another randomized controlled trial (RCT). As a result, Offenbacher's team concluded: "These findings suggest that a single treatment employing only scaling and root planing was not adequate to control gingival inflammation between baseline and delivery. Preterm birth and periodontal disease may both share a common underlying condition or trait, for example, an exaggerated inflammatory response that might explain the clinical response to the oral infection and the inflammatory process associated with obstetric complications."

Shortly afterwards, a team of gynecologists and dentists published a study which did not confirm periodontal disease as a risk factor for perinatal complications [42]. Then, in a follow-up, the same group demonstrated that pregnant women whose dental treatment had been successful had significantly fewer preterm deliveries than women who had not been treated successfully [43]. This result, however, was not substantiated in a review of

[1] This case, part of the material of a doctoral thesis, has been explored and presented in a book (Kirkengen AL. Inscribed bodies. Springer; 2001) and has recently been updated by the women herself for this publication.