

## Anxiety, emotion and dentistry – the digital media world affecting our patients.

Ansiedad, emoción y odontología: el mundo de los medios digitales que afecta a nuestros pacientes.

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The current world with its frenzied evolution bring about consequences that have hit the health professions and, markedly, our dental specialities. Issues like stress, anxiety and an accelerated mental state have been a theme of numerous papers and research pieces. The need to keep up with all the fast and global communication processes is quite a challenging task. One of the most commented topics is “*overthinking*”, which is described as a great deal of unnecessary thought. When observing the novel behaviour of our modern society with its excessive use of mobile technology we can notice its reflexes. An intimate, almost unlimited access to it, mainly with fast mobile information, indiscriminately stimulates day and night the pathways of neural excitation, altering the circadian cycle, and producing stress and anxiety, observed especially in children and adolescent, according to a survey.<sup>1</sup> This mechanism stresses our body triggering the fight and flight response loops. An excessive production of cortisol, generates more stress, thus promoting a neural excitement chain and consequently an overload of information resulting in mental and consequently physical exhaustion.

Nevertheless, the frequent requests for mental activities to cope with a digital virtual world offered by mobile electronic media has generated emotional and somatic changes that can be apparent in many ways. It is not always easy to detect when a physical alteration, away from normality, appears, as not everyone has an adequate perception of their own physiology.<sup>2</sup> The picture is more delicate, knowing that anxiety will develop as a habit in almost every one that seeks to get as much information as possible from social media and smartphones.<sup>1,3</sup> In children and adolescents, this can also trigger a sleep bruxism phenomenon.<sup>4</sup>

But why do we, as doctors of dental medicine, need to navigate through this issue? Well, it is important to reinforce that the mouth is a highly differentiated organ with circuits and neural connections governed by vital regions of the brainstem<sup>5</sup> and represents a region of the body where dentists have the privilege to detect hidden changes that manifest in it. The indispensable integration of dentistry within science, covering neurophysiological aspects, favours the understanding of the stomatognathic system as a non-fragmentable unit, but rather as

a complex circuitry receptor (input) and effector (output) of neural actions.

It is important to know that in addition to the mechanical function of chewing, tasting, detecting textures and food volume, the chewing organ is a sensory-engine organ that expresses emotions.<sup>6</sup> And when there is an emotional imbalance, there are oral manifestation signals, which we must visualize, detect and diagnose by collecting specific data from medical and dental history and from clinical examination.

That is done with an eager eye and ear and curiosity to discover alterations that lie beyond a patient's complaints. So, a dentist can detect emotion imbalances through the stomatognathic system ahead of a patient's awareness of these. Dentists face a new world in behavioural science as nowadays patients and parents come to the dental clinic reporting that their children or themselves present alterations in their sleep cycles, are biting and clenching the teeth during sleep, and have headaches, difficulty in chewing, snoring, oral breathing and oesophageal gastric reflux or discomfort and pain complaints.<sup>7</sup>

The stomatognathic system can present diverse and concomitant alterations due to enamel abfractions, wear on dental surfaces (enamel and dentine), abfractions, erosion of enamel by gastric reflux (perimolysis), signs in the inner mucosa as flaking of whitish colour, gum alterations such as burnt mucosa, presence of tension nodules in the cranio-oral-cervical muscle chain, cephalgia, alveolar bone loss due to pathological restriction and grinding in primary or secondary bruxism, onychophagia, opening and closing deviation in temporomandibular joint disorder, among others. Reported symptoms include a dry mouth when sleeping, dentin hypersensitivity, tongue pain, morning or tension headaches, and pain in the temporomandibular joint. Distinguishing between different occurrences in the stomatognathic region deserves care and interaction with the information provided by the patients, and one should also investigate patients concerns, worries, behaviour, sleep hygiene, daily routine, entertainment and physical activities.

Contemporary humans still retain the brain reactive-fear circuit when dealing with emotion.<sup>8</sup> Instead of using biting as a weapon or teeth as an instrument,

humans are using their teeth to express and release stress during the act of sleeping, manifested as sleep bruxism events.<sup>9</sup> This happens as the evolved cerebral cortex (neocortex) suppresses part of the aggressive behaviour of modern man.

The amygdala, our main alarm in the limbic system (central nervous system), triggers the autonomic nervous system (SNA), the hypothalamic-pituitary-adrenal axis, which physiologically mediates the fear circuit as a physiological event.<sup>10</sup> This connected chain of events will result in the release of adrenaline, neurotransmitters and endocrine hormones inducing an increase in cardiac, respiratory and muscular activities and promoting an internal input that affects all visceral organs and skeletal muscles.

Thus, tensioning the whole body as a reaction due to repetitive masticatory muscle activity by grinding, and a cardiac trigeminal reflex occurs mediated by signals from the trigeminal nerve nuclei to its neighbour vagus nuclei to promote bradycardia and a decrease in muscles activity, and stress relief will take place.<sup>11</sup>

Nonetheless, it is understood that bruxism has beneficial effects by reducing stress-induced allostatic overload reactions.<sup>12</sup> However, this physiological loop system can be overloaded and the alostasia will not take place as it should, compromising both body and mind. This complexity of the human brain, challenges and intrigues health professionals to understand how neural circuits behave in the movement field, and motivate research in an attempt to elucidate and solve problems that impact affectivity and emotion.<sup>13</sup>

Nowadays new approaches and perceptions related to the emotional behaviour of patients who attend private and public health clinics must be considered. New evaluations should be implemented to understand the implications of emotion in the biological and biochemical aspect of everyone. A detailed medical history, directed to the psychological aspects and sleep hygiene habits and behavioural aspects of daily life should be a routine part of a patient's evaluation involving the four pillars of diagnosis, guided planning, needed prevention and treatment. Decisions should be made not only regarding dental and pharmacological approaches but also fundamentally regarding a behavioural approach.<sup>4</sup>

The existent gap between evaluation and therapies currently used shows that treatment and monitoring of such functions have been incomplete and sometimes ineffective. As such, clinical dental records must be suitable for registering mainly children and teenager's data as they are changing their social behaviour.<sup>14</sup>

Medical, dental history and clinical examination notes have to include specific questions and observations concerning sleep experience such as sleep hygiene (bedtime, presence of light or darkness while sleeping, duration of sleep, quality of sleep, presence of restless leg syndrome, bruxism, snoring, grinding, gnashing, presence of digital media in bed, use of computer before/in bed, ingestion of sweet beverages) and specific questions related to anxiety

(stress, social behaviour in school, at home, interests and goals) in accordance with clinical examination and dysfunctions. Therefore, working in cooperation with other professionals related to behaviour approaches is necessary.

Knowing that the brain is a powerful organ, and its structure is always changing—depending upon our thoughts and experiences—we need also to be updated to understand and benefit our patients with our resources or preferentially with our empathy. However this is not a simple matter as there are internal and subjective manifestations; Brewer<sup>3</sup> states that people must put this fast and excessive information to good use, must get back in control, and learn how to use technology wisely, instead of falling into the trap.

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