



The stress factor: serving or at the expenses of memory?

As a practitioner who uses Froggy mouth, you may ask yourself, why we constantly indicate stress notion regarding neuronal learning processes, which has not yet been described in the literature. Clinical observations led us to new investigations on this subject.

How is it possible for a child with deep cerebral palsy to modify its lingual posture in such few times, taking into account its motor difficulties?

Another clinical experience shows a second case of a 2 year old child with lymphangioma of the posterior part of the tongue and multi-cysts in the oropharynx leading to permanent protrusion of the tongue posture: how can he react to the stimulations triggered by Froggy mouth in less than 5 minutes ?

The aim of this study is to assess why neuronal processes elected by the use of Froggy mouth occur so fast.

As previous studies have reported stress is mainly considered a negative impact on learning processes.

A chronic stress leads to an overactivation of the HPA axis (Hypothalamus, pituitary gland, and adrenaline), which may atrophy the dendrites located in these structures, degrade synaptic plasticity and diminishes neurotransmitters sensitivity (Joëls et al, 2006). An extended period of stress is harmful for the structures in charge of the normal function of the patient and for the learning possibilities because neuronal connections are damaged.

But according to Olivier Bégin-Caouette's blog and Freddy Janneteau's studies (leader of "stress, hormones and plasticity"; functional genomic institute of Montpellier) a positive effect can be observed regarding stress.

Kim et al, (2001) describe stress as a factor with great impact on synaptic plasticity and hippocampus, structure in charge of information storage.

Investigations by Joëls et al (2006) highlighted that stress was

able to activate the memory mechanisms only when the organism has to memorize the event and only when hormones and neurotransmitters activate the same pathways that have been activated by leaning processes.

Thus, a combination of the time frame and the intervals between learning processes and the cause of stress created by the device is crucial. We have to keep in mind that the positive effect of the stress, can only be induced if the stress intensifies the connections affecting learn processes and not those linked to other events. Stress seems to have an accentuated effect on neural connections. Shors (2004) showed that these effects happen on a macroscopic level. This can be explained by the fact of the major role of mineralocorticoid hormones which are involved in all the tasks characterizing the consolidation of learning processes (Zorawski et al., 2005). Indeed, those hormones, like the cortisone directly intervene on the encoding, integration, selective attention, and cognitive efficiency, what allows an increased memory consolidation.

In the course of a stress event norepinephrine, peptides and corticosteroids are released and generate greater activity of hippocampal neurons (Joëls, Pu, Wiegert, Oitzl et Krugers, 2006).

All these conditions pertain when the patient applies Froggy mouth for the first time. The impossibility to properly seal the lips prevents a development of the motor sequence of swallowing suction, provoking a major stress in the brainstem, swallowing being a vital praxis. These processes take place on an unconscious level because the patient has been instructed to follow a television program while wearing the appliance. The inhibition of the facial nerve activity will promote trigeminal activation, allowing dental occlusion, which enables the lingual dome and the palatal arch to touch. This allows discovery and engrainment of toothed subject type swallowing (secondary deglutition).

In this situation, there is a concomitance of stress release and the learning of a new procedures.

Bibliography:

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