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Itch-Scratch-Anxiety Cycle is a Chronic Cognitive Neuro-Endocrine Mediated Behaviour in Our Mind

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Scratching is a distinguishing feature of many resistant dermatosis like Chronic Atopic Dermatitis. Recently, discovery in neuroendocrinology, immunology and MRI studies suggest itch – scratch cycle may be an addictive neuroendocrine mediated pathological movement pathway with an aberrant and imbalance of neurotransmitters in Central Nervous system (CNS).

Mas-related G protein-coupled receptor A3 (MrgprA3) and MrgprC11 expressed afferent neurons penetrated in the epidermis together with Transient Receptor Potential (TRP) receptors like TRPV (vanilloid) 1, TRPV 3, TRPV4, TRPA (ankyrin) 1 together with Serotonin receptors relay itch signals from the periphery synapses to the dorsal horn of spinal cord. Pruritogenic signals via the afferent neurones synapse with Gastrin -Releasing Peptide Receptors (GRPR) in the spinal cord. GRPR activation released substance P, Calcitonin G Releasing Peptide, Vasoactive Intestinal Peptide including Pituitary adenylate cyclase activating peptides which was distributed in the CNS. Endothelin-1, tachykinin through neurogenic inflammation increased levels of Th2 cytokines and interleukin – 31 also mediate itch. The central station of itch transmission in our brain is the Thalamus. Hedonic scratch activated the primary somatosensory S1 areas gave the perception of comfort in the cingulate cortex decided the planned motor response of scratching. The midbrain, striatum, ventral tegmental area, caudate nucleus and ventromedial prefrontal cortex as shown by MRI studies are activated in this pleasant circuitry. If this endogenous neuroendocrine circuitry become uncontrolled, harmful cravings behaviour superseded. Insula cortex and Claustrum of the brain play a prominent role in interoception including addiction. They are highly activated when itch is intensified. The adverse pruritic experience is represented in amygdala, subcallosal gray matter and nucleus accumbens. The miswiring and imbalance of 5 Hydroxytryptamine and its multiple receptors are involved.

Besides pharmacological intervention, cognitive behavioural therapy including education, refocusing attention strategy; virtual reality immersion; audio visual distraction techniques; habit reversal training; arousal reduction and cognitive restructuring are helpful.

Biography:

Chan Kam Tim Michael is a practicing private Dermatologist in Hong Kong. He received Dermatology Specialist Fellowship in Hong Kong Academy of Medicine in 1998. In the same year, he was granted a Government of Hong Kong scholarship for post graduate training in UCLA, USA. He is now the Vice President of the Association of Integrative Aesthetic Medicine in Hong Kong. He was editor of the Hong Kong Journal of Dermatology and Venerology from 2002 to 2007. He acts as Editorial Board Members of the following international journals since 2017: Research Journal of Nervous System; The Cognitive Neuroscience Journal, Medical Reports and Case Studies and Advances in Neurology and Neuroscience. He has been working in the University of Hong Kong as Honorary Clinical Assistant Professor from 2007 to 2009. He is now a part time lecturer in the Baptist University of Hong Kong for teaching Master Course in Public Health.