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Chocolate Consumption and Endorphin Release-A Relationship from Addiction to Health Promotion

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Introduction

Chocolate eating related to endorphin release which is the main reason for addiction, analgesic activity, anti-inflammatory activity, stress reduction, immune stimulatory activity, self-reward and increases cognitive development. Currently eating chocolate is considered as bad for health perspective because it has low nutritive and high caloric value with lot of additives such as coloring agents, flavoring agents, emulsifier, sugar, cocoa, milk which can cause obesity, increases blood sugar level, liver problems, dentinal caries in a long run. On the other side, it has got health benefit also chocolate consists of milk, sugar wheat, nuts, vegetable fats, coca.

Endorphins are endorphins, opioids, produced in the pituitary gland in response to pain and stress. There are three types of endorphins beta endorphin, enkephalin and dynorphin binds with μ, k, and γ receptors present on the immune cells and nervous system. Beta endorphin, an abundant endorphin synthesizes and stored in the anterior pituitary gland; it is a precursor of POMC (Proopiomelanocortin), a large protein produced in response to CRH during psychological stress cleaved in to beta endorphin, MSH and ACTH. Receptors of endorphins are increased during stress such as inflammation. Most immune cells produce endorphins because it possesses mRNA transcripts for POMC.

Beta endorphin binds with its μ receptors present on the peripheral nerves results in inhibition of substance P, a neurotransmitter of pain and inflammation. In the central nervous system, beta endorphin binds with its μ receptors present on the central nervous system results in inhibition of GABA inhibitory neurotransmitter involved in analgesic activity, euphoria, stress buster activity, cognitive development, self-reward and addiction.

Description

Endorphin receptors present on the most immune cells. Beta endorphin binds with its μ receptors situated on the innate and adaptive immune cells such as neutrophils, macrophages, NK cells, dendritic cells, T cells, Bells results in activation of immune cells release IFN-γ, opsonin, granzyme-B and antibodies involved in anti-inflammatory activity, antiviral activity and antitumor activity. Beta endorphin inhibit chronic psychological stress induced activation of sympathetic nervous system activity and activation of parasympathetic nervous system of ANS through inhibition of HPA axis mediated release of stress releasing hormones such as cortisol, ACTH and noradrenalin activate inflammatory mediators such as IL-1, IL-6, TNF-α, which in turn activate NF-KB and STAT-3 key transcription factors involved in chronic inflammatory diseases such as heart disease and Alzheimer's disease, cancer, autoimmune diseases, infectious diseases and aging. Beta endorphin involved in delay aging by lengthening telomeres and another mechanism by inhibiting ROS and RNS free radicals produced from neutrophils, macrophages, dendritic cells during oxidative stress *via* NADPH oxidase pathway and ROS, RNS free radicals are expressed by NF-KB a key transcription factor involved in chronic inflammation, tissue damage, DNA damage, gene mutation and cell death.

Conclusion

Endorphins are produced during yoga, pranayama, meditation; intense physical exercise creates a psychological relaxed state known as "Runner's High", music therapy, love, tender, care, sex, sympathy and empathy in caring the patient, acupuncture, singing, dancing, patient faith or belief in the drug or doctor cures disease known as 'Placebo' effect.

Dependency and tolerance not seen in beta endorphin compared to exogenous endorphins.

Understanding of beta endorphin and its mechanisms of actions such as analgesic activity, stress buster activity, anti-inflammatory activity and immune stimulatory activity will be helpful for holistic management of various diseases without adverse effects and inexpensive.

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