THE PLEASURE EFFECT

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The relationship between nicotine, dopamine, and the pleasure effect

Studies examining the link between dopamine and pleasure show increased dopamine volume in certain parts of the brain during rewarding activities.

THE DOPAMINE EFFECT

In the brains of people who don't smoke during stimulating activities, we witness an increase of acetylcholine which lodges in the neuron receptors that contain dopamine. This has the effect of liberating the dopamine which stimulates the reward centres that are responsible for well-being and arousal.

The release of dopamine in the brain is regulated by a substance that we call MAOB (monoamine oxydase B). This substance is responsible for smooth functioning and balance in the brain, while maintaining the level of dopamine at regular levels.

THE REWARD EFFECT

In the brain of people who smoke, nicotine lodges in the neuron receptors which should have received acetylcholine and competes with acetylcholine by replacing it at the level of the receptors.
When a person smokes repeatedly, the receptors become saturated because of the increased presence of nicotine. Other receptors are then created in the brain to accommodate the surplus nicotine, which then generates a supplementary production of dopamine.

The regulatory function of MAOB is then altered by a substance, as yet not identified, that is present in cigarette smoke. Then follows an increase in the level of dopamine in the brain: a state of euphoria takes over, thus creating a reward effect.

THE CRAVING EFFECT

A craving is felt when the quantity of dopamine diminishes. It is the brain's way of complaining, asking for more nicotine to fill the empty receptors. A person who smokes then lights another cigarette. The shortage or craving disappears for several minutes and the cycle starts all over again.

This alteration between the manifested need for nicotine and the fact of smoking a cigarette to satisfy the need is what is commonly referred to as a dependency.

DEPRESSION

People with depression are a good example to illustrate the role that dopamine plays in the sensation of pleasure. Depressive people are characterized by a deficient reward system which explains their prolonged sadness, loss of interest or pleasure and the manifestation of deep fatigue. These people are, as a result, susceptible to smoking, because they seek a certain satisfaction that nicotine can give them with the artificial production of dopamine.

HOW TO STIMULATE DOPAMINE NATURALLY

It is possible to alleviate nicotine withdrawal symptoms by promoting the natural production of dopamine. So, to make the transition to a smoke-free life more tolerable, many people stimulate the production of dopamine in their brain by rewarding themselves through physical exercise and by taking part in creative or feel-good activities.

Source: Video document from the Radio-Canada program Découverte. lecerveau.mcgill.ca

If you want to quit smoking, you're not alone!

Counsellors at the j'Arrête Smokers' Helpline and Quit Smoking Centres are there to help you in your initiative.