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Dopaminergic pathways and their addictions: Gambling on dopamine

Vias dopaminérgicas e seus vícios: Apostando com a dopamina

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ABSTRACT

Introduction: In neuroscience, it is known that dopamine takes part in functions such as motor control, learning, reward, and others. Today, gambling is understood as a predominant recreational behavior and can mimic the effects of psychostimulants. It is estimated that about 5% of adults have problems with gambling, the most serious form being known as pathological gambler (PG), however, their relationships remain unknown. Methodology: A bibliographic review was carried out, in English and Portuguese, on the scientific platforms PubMed, Scielo and Nature, in recent years on the subject. Results: Dozens of studies were found and of these three were evaluated. Studies show that addictive behaviors can produce brain changes corresponding to drug use, sometimes with a reduction in the electrical activity of the prefrontal region, area responsible for assessing potential risks and inhibiting impulsivity. Monitoring the activity of dopaminergic neurons in monkeys was analyzed and showed that after receiving a surprise reward (juice), they responded with a high release of dopamine. However, when they learned that after a certain stimulus was followed by a guaranteed reward, they responded with less activation. In addition, another study showed that the more intense and recent the gambling activity, the greater the density of dopamine receptors, whereas in cases of game deprivation, the density would decrease. Conclusion: It is concluded that PGs do not have structural abnormalities or mutations in receptors that would justify addiction. However, it was shown that they are dependent on the release of dopamine, requiring increasing concentrations for the same effects and that the greater the reward, the greater the release. What's more, gambling is a risk factor for other addictions. Therefore, they should be encouraged to decrease their frequency gradually to avoid oscillatory disorders, such as withdrawal syndrome.

Keywords: Games, Gambling, Dopamine, Receptors, Brain.

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