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Genetic addiction risk score (GARS)™, a predictor of vulnerability to opioid dependence.

Blum K¹, Chen ALC², Thanos PK³, Febo M⁴, Demetrovics Z⁵, Dushaj K⁶, Kovoor A⁷, Baron D⁸, Smith DE⁹, Roy AK III¹⁰, Fried L¹¹, Chen TJH¹², Chapman E Sr¹³, Modestino EJ¹⁴, Steinberg B¹⁴, Badgaiyan RD¹⁵.

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Abstract

The interaction of neurotransmitters and genes that control the release of dopamine is the Brain Reward Cascade (BRC). Variations within the BRC, whether genetic or epigenetic, may predispose individuals to addictive behaviors and altered pain tolerance. This discussion authored by a group of concerned scientists and clinicians examines the Genetic Addiction Risk Score (GARS), the first test to accurately predict vulnerability to pain, addiction, and other compulsive behaviors, defined as Reward Deficiency Syndrome (RDS). Innovative strategies to combat epidemic opioid, iatrogenic prescription drug abuse and death, based on the role of dopaminergic tone in pain pathways, are proposed. Sensitivity to pain may reside in the mesolimbic projection system, where genetic polymorphisms associate with a predisposition to pain vulnerability or tolerance. They provide unique therapeutic targets that could assist in the treatment of pain, and identify risk for subsequent addiction. Pharmacogenomic testing of candidate genes like CB1, mu receptors, and PENK might result in pharmacogenomic, personalized solutions, and improved clinical outcomes. Genetically identifying risk for all RDS behaviors, especially in compromised populations, may be a frontline tool to assist municipalities to provide better resource allocation.

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