

Clinical Practices that can Combat Endemic Legal Opioid Dependence: Genetic Addiction Risk Score (GARS)TM, KB220ZTM, Comprehensive Analysis of Reported Drugs (CARD) and Electrotherapy

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Iatrogenic prescription drug abuse in the United States caused ~27,000 unintentional drug overdose deaths back in 2007 when 9 million individuals reported chronic use of opioid pain treatment [1,2]. The Reward Deficiency Solution System (RDSS) presented here brings together research into strategies being developed for clinicians to assist in avoidance of some of the unintended consequences of opioid pain treatment. Genetic mechanisms in the prefrontal cortex (PFC) and the mesolimbic “reward center” have a role in the moderation of pain sensitivity and tolerance and can be used to determine genetic addiction predisposition [3]. Patients at risk would benefit from non-addictive alternative treatments for pain and careful monitoring.

A pilot study of genetic addiction risk score (GARS) severity was conducted in 70 patients attending two independent addiction treatment centers. The percentage of prevalence of the risk alleles (DRD2=A1; DRD3 =Gly; DRD4= 3R or 7R; SLC6A3 (DAT) =10R; 5HTTLPR = L or LA; OPRM1 = G; GABA 3 =181; MAO= 3R; and COMT=G) was calculated and an arbitrary severity score established based on the percentage of risk alleles present. Physiological “mechanisms of action” of H-Wave device stimulation (HWDS) have been investigated in animals and assessed in a recent meta-analysis. A natural dopaminergic agonist (KB200Z) has been evaluated using fMRI, and qEEG, in humans and most recently rodent models. Data from Comprehensive Analysis of Reported Drugs (CARD) 2010-2011 (n=2,919; total 5838 urine specimens) was analyzed for compliance to treatment and abstinence [4].

The GARS pilot found 14% low risk; 81% moderate risk and 5% high risk. HWDS was shown to reduce edema (stimulation of lymphatic smooth muscle fibers) provide loading to healing tissue and benefit tissue healing (by induction of nitric oxide (NO)-dependent microcirculation augmentation and angiogenesis -new blood vessels formation). Meta-analysis determined that HWDS reduced pain medication requirement, provided pain relief and promoted earlier functionality. KB220Z showed BOLD activation of dopaminergic pathways and PFC – cingulate gyrus activity regulation in humans. Finally, CARD analysis revealed significant differences in both compliance and abstinence rates. Opioid replacement programs compliance was best with Methadone 88% and Suboxone 92% but high non-abstinence ~49% (opioids accounting for ~ 47%).

GARS tests (including P450-associated with narcotic metabolism [5]) can identify patients with a predisposition to addiction early in treatment. Patients at risk will need a non-addictive alternative pain

therapy like the electrotherapeutic H-Wave[®] device [6]. Another alternative KB200Z was engendered by the identification of the genetic therapeutic targets associated with Reward Deficiency Syndrome (RDS) [7]. This non-narcotic pharmacogenomic dopamine agonist can treat pain, improve pain tolerance and cognition, reduce craving and promote compliance [3]. Currently, we are under taking neuroimaging studies of KB220Z in rodents and an analysis of genetic risk for RDS in patients presenting with pain with and without associated RDS behaviors (n~400). A positive association will support the incorporation of genotyping of pain patients, at entry, for opiate addiction risk. To reduce addiction morbidity and mortality in pain treatment we propose a RDSS: genetic testing for both narcotic metabolism and risk, non-addicting treatment alternatives; electrotherapy, dopaminergic activation KB220Z, careful monitoring and documentation of compliance and abstinence CARD coupled with the Revised Screener and Opioid Assessment (SOAPP-R) [8].

Conflict of Interest

Kenneth Blum, PhD is the holder of a number of patents involved with genetic testing and nutrigenomics and is currently- Managing Partner of IGENE, LLC and owns shares in Impact Genomics, Inc. the exclusive worldwide distributors of the GARS test and KB220Z respectively. He is a consultant Chief Scientific officer of G and G Healthcare Services LLC and Genomics Healthcare, LLC. He is on the Advisory Board of Dominion Diagnostics, LLC, Malibu Beach Recovery Center, Path Foundation, NY. He receives grants from Life Extension Foundation to Path Foundation. Mary Hauser is vice President of Dominion Diagnostics the commercial developer with IGENE LLC for the GARS test. Thomas Simpatico is on the Advisory Board of Dominion Diagnostics. Both Dr. Blum and Dr. DiNubile are paid consultants of Electronic Waveform Labs Huntington, Beach, California. No other conflict of interest.

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