ZN DEFICIENCY: A CAUSE OF OPIOID-INDUCED PHYSICAL DEPENDENCE AND ADDICTION

Primary Author: Manoj Jagtiani
Hackensack University Medical Center – Palisades

Co-Authors: Tyler Tantillo, Vinay Kudur

OBJECTIVES: This study seeks to determine (1) if patients on opioid therapy are zinc deficient and if the length of opioid therapy (acute vs. chronic) has any effect on the magnitude of zinc deficiency, and (2) if administration of supplemental zinc in zinc-deficient patients who are taking opioids has any therapeutic effect in reducing opioid addiction and dependence symptomology.

BACKGROUND: Within the past decade, opioid abuse and related overdoses have increased drastically, warranting the need for research directed against the opioid epidemic. Previous studies have indicated that patients on opioid therapy are zinc-deficient through three proposed mechanisms: urinary excretion, malnutrition, and hepatic redistribution. Zinc has been implicated as a potential therapeutic adjunct to opioid treatment through its ability to antagonize µ-opioid receptor activation, which is responsible for producing symptoms of physical dependence and addiction.

METHODS: Post-operative joint replacement orthopedic patients and chronic pain-management patients on acute and chronic courses of opioid therapy, respectively, will be assessed for zinc levels (plasma, erythrocyte, random urine), which will be compared to zinc levels of a control group. These zinc levels will be measured following the cessation of opioid therapy. Once the first phase of the study is completed, chronic pain-management patients on long-term opioid therapy who have a confirmed zinc deficiency will be divided into treatment and control groups. The treatment group will receive supplemental zinc therapy; the control group will receive placebo capsules. For all patients in this study, opioid addiction and dependence will be measured and quantified using the Rapid Opioid Dependence Screen. DISCUSSION & CONCLUSION: The goal of this study is to test the hypotheses that the length of opioid therapy is directly correlated to an increased tendency for zinc deficiency and that zinc supplementation can reduce the development of opioid addiction and physical dependence. The absence of zinc at the µ-opioid receptor perpetuates the likelihood of developing physical dependence and addiction. Thus, the administration of zinc supplementation with opioid treatment is expected to reduce physical dependence and addiction through zinc’s antagonist effect at the µ-opioid receptor.