Title: Evaluation of Steroid-Induced Hyperglycemia in Non-Diabetic Patients Hospitalized with COVID-19

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Background: Dexamethasone has become part of standard therapy in treating COVID-19, as it reduces 28-day mortality in patients who have received supplemental oxygen or mechanical ventilation. All steroids can increase blood glucose, resulting in steroid-induced hyperglycemia. The purpose of this study was to characterize the effects of steroids on glucose control and insulin therapy in patients without diabetes admitted to the hospital with COVID-19.

Methods: This retrospective cross-sectional study included 150 adult patients that received at least one dose of dexamethasone, hydrocortisone, methylprednisolone, or prednisone, and had a positive COVID-19 test within 30 days of admission to Carilion Roanoke Memorial Hospital between October 1, 2020 and March 31, 2021. The study was deemed a Health Care Delivery Improvement Project and therefore was not reviewed as human subjects research. Patients were excluded if they had diabetes, were pregnant, placed on extracorporeal membrane oxygenation, or received steroids in the week prior to admission. The primary endpoint was incidence of steroid-induced hyperglycemia characterized by a blood glucose of 200 mg/dL or greater. Secondary endpoints were characterization of steroid and insulin therapies.

Results: The primary outcome occurred in 43 out of 150 patients (28.7%). Of those 43 patients, 23 received at least one dose of insulin to treat steroid-induced hyperglycemia, and two patients received an insulin drip during steroid therapy. In patients who received insulin, the mean total daily dose of insulin while receiving and after completion of steroid therapy, was found to be 0.14 units/kg/day and 0.13 units/kg/day, respectively. There were three episodes of hypoglycemia documented.

Conclusion: It is important for patients, regardless of a diagnosis of diabetes mellitus, to have monitoring of glucose while receiving steroids for the treatment of COVID-19.