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CALCIUM/MAGNESIUM RATIO IN PATIENTS WITH DIABETES AND CHRONIC KIDNEY DISEASE: A RISK FACTOR FOR CARDIOVASCULAR DISEASE

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Background and Aims: Chronic Kidney Disease (CKD) and Diabetes Mellitus (DM) are significant risk factors for Cardiovascular (CV) Disease. Patients with CKD and/or DM exhibit higher incidence and prevalence of CV events compared to the general population. Hypomagnesemia and elevated calcium-magnesium (Ca:Mg) ratios have been identified as independent risk factors for CV-related deaths. The aim of this study is to determine the relationship between Ca:Mg and the prognosis of CV disease in patients with CKD and DM.

Method: This cross-sectional study enrolled patients with DM and CKD followed at Diabetic Nephrology appointments in a hospital. The study population was divided into two groups: Group 1 (G1) - patients who had a previous hospitalization due to a CV event, and Group 2 (G2) - patients without CV-related hospitalizations. A logistic regression model was employed to evaluate the predictive factors for CV hospitalization for the variables studied.

Results: A total of 223 patients were included in the study, 92 females and 131 males, with an estimated glomerular filtration rate of 38.4 ± 22 mL/min/1.73 m² and 41% had been hospitalized due to a CV event. G1 had higher age ($P = .02$), higher serum phosphate ($p < 0.01$), parathormone ($p < 0.01$), interleukin-6 ($p < 0.01$), FGF-23 ($p < 0.01$), oxidized-LDL ($p < 0.01$), Ca:Mg ($p < 0.01$), and pulse pressure ($p < 0.01$), as well as lower eGFR ($p < 0.01$) and magnesium

serum levels ($p < 0.01$). The multivariate logistic regression model revealed that higher FGF-23 levels (OR=3.44, 95% CI 1.192-9.954, $P = .02$), Ca:Mg (OR=1.204, 95% CI 2.072-59.040, $P = .01$), oxidized LDL (OR=9.746, 95% CI 3.277-29.020, $p < 0.01$), and an eGFR < 30 mL/min/1.73 m² (OR=8.685, 95% CI 1.277-59.040, $P = .03$) were predictors of CV morbidity.

Conclusion: In this population, Ca:Mg and FGF-23 were predictors of CV morbidity. Further studies are necessary to fully understand the relationship between serum magnesium and calcium levels and CV events. Monitoring these parameters may be valuable in clinical practice to identify high-risk patients.