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MetroHealth Medical Center

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Abstract Submission Form

Poster Title: **Higher Vitamin D Levels Before Methotrexate Start Are Associated with Lower Subsequent Mortality in Rheumatoid Arthritis**

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Category: **PHERI/Health Care Research**

Background/Purpose Vitamin D is an immune-modulating hormone. Low Vitamin D levels have been associated with higher disease activity in early Rheumatoid Arthritis (RA). Furthermore, low Vitamin D levels have been associated with subsequent mortality in non-autoimmune disease populations. Here in the setting of RA we investigated the relationship between serum 25-hydroxyvitamin D (25(OH)D) levels before starting methotrexate (MTX) therapy and subsequent all-cause mortality in national and local Veterans Affairs (VA) cohorts.

Methods This is a retrospective cohort study of patients with an ICD-9/10 diagnosis of RA seen in Rheumatology clinic visits. The data collected was time oriented around initial prescribing of MTX, a MTX possession ratio > 75%, and a clinical 25(OH)D level before starting MTX in the national (n=15,109) and local Cleveland (n=197) VA cohorts. Chart adjudication to verify RA diagnosis and Vitamin D supplementation was performed for the Cleveland cohort (n=197). We examined survival in RA patients with serum 25(OH)D > 20 ng/mL and 25(OH)D $\leq$ 20 ng/mL using Cox Proportional-Hazards Model. The model was adjusted for traditional cardiovascular risk factors.

Results Patients with 25(OH)D levels > 20 ng/mL before starting MTX had a 28% reduced risk of mortality when compared to patients with 25(OH)D levels $\leq$ 20 ng/mL (HR 0.72; CI 0.64, 0.80; $p < 0.001$) in the national VA cohort. Age, gender, smoking status, Charlson comorbidity index, and BMI also independently associated with mortality. We observed higher 25(OH)D levels after Vitamin D supplementation compared to before ($p=0.008$) in the Cleveland chart-reviewed cohort.

Conclusion RA patients with Vitamin D levels > 20 ng/mL have lower subsequent mortality when compared to those with Vitamin D levels $\leq$ 20 ng/mL in a large national RA cohort receiving standard of care MTX. The relationship between Vitamin D level and mortality held after adjusting for traditional cardiovascular disease risk factors. The data from Cleveland demonstrate the feasibility of normalizing serum Vitamin D levels with Vitamin D supplementation in this patient population. The extent to which correction of serum Vitamin D levels in patients who were initially found to be Vitamin D deficient impacts upon all-cause mortality in RA is yet to be determined.