

## ASSOCIATION BETWEEN SOLAR LIGHT EXPOSURE AND TOTAL MORTALITY AMONG RENAL TRANSPLANT RECIPIENTS

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**Background:** Vitamin D deficiency is prevalent among renal transplant recipients (RTRs). Vitamin D may play a role in reducing inflammation and slowing disease progression. Solar light is an essential component in initiating events resulting in the active form of vitamin D within the human body. This study evaluated the association between solar light and survival among RTRs.

**Methods:** This retrospective cohort study included 38,102 subjects identified through the US Renal Data System (USRDS), included adult, RTRs, transplanted between 1997-2002, and living in the continental U.S.A. Solar radiation data was obtained from the National Solar Radiation Database (NSRDB). Annual average values based on monthly concentrations of solar radiation data for the year 2000, were interpolated to ZIP code centroids according to the residence of the RTR population. Cox Proportional Hazard models used to estimate effect of solar radiation (<3600 reference, 3600-<4000, 4000-<4400 and 4400+ Wh/m<sup>2</sup> categories) on risk of total mortality, while adjusting for confounders.

**Results:** The relative risk (RR) for total mortality among RTRs residing in areas with 3600- <4000 Wh/m<sup>2</sup> of solar radiation was 1.14 (95% CI, 1.01-1.28) in the multivariable adjusted model. For subjects residing in higher solar radiation areas with 4000 – <4400 Wh/m<sup>2</sup> and for areas equal to or greater than 4400 Wh/m<sup>2</sup> the RR for total mortality was 1.08 (95% CI, 0.95 - 1.24) and 1.03 (95%CI, 0.91 -1.16), respectively in the adjusted models. When excluding subjects with prevalent heart disease at time of transplant, the strongest association between solar radiation and total mortality was RR=1.21(95%CI, 1.05-1.39) and found for subjects within the lower solar radiation area of 3600-4000 Wh/m<sup>2</sup>.

**Conclusion:** The findings indicate that for RTRs, living in areas with lower levels of solar radiation may negatively impact survival and increased solar light exposure may be warranted among RTRs in areas with less intense solar radiation.