A PRELIMINARY EVALUATION OF ENVIRONMENTAL LIGHT POLLUTION, ANTHROPOMORPHIC CHARACTERISTICS, AND BEHAVIORAL FACTORS IN PREDICTING URINARY MELATONIN METABOLITE CONCENTRATIONS

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Background and Aims: There is growing evidence that light pollution may play a role in a variety of diseases, including cancer. For cancer, the primary mechanism postulated is that exposure to light-at-night (LAN) suppresses the production of melatonin, an endogenous hormone with oncostatic properties. Our objective was to evaluate whether exposures to LAN, as well as anthropomorphic and behavioral factors, predict levels of 6-sulfatoxymelatonin (6-SMT), the primary urinary metabolite of melatonin.

Methods: Participants consisted of 301 women who provided a 24-hour urine sample, completed a questionnaire, and resided in Northern California. Approximately half lived in urban/suburban regions and half in more rural areas. A geographic information system was used to assign outdoor LAN levels to participants' residences based on satellite imagery data maintained by the U.S. Defense Meterological Satellite Program. Indoor LAN exposures were estimated from survey responses regarding the use of bedroom lighting and sleep habits. Data on anthropomorphic and behavioral factors were garnered from survey questions. An ELISA was used to quantify 6-SMT concentrations in urine. Concentrations were creatinine adjusted and transformed to symmetrize the data prior to statistical analyses. Age-adjusted generalized linear models were used to assess significant predictors of 6-SMT.

Results: Outdoor LAN values varied between participant residences, with levels highest among those in urban/suburban areas and lowest among those in rural areas (p-value <0.001). Among younger women, 6-SMT levels did not vary with age, but among those $\geq$55 years, levels dropped significantly with increasing age (p<0.005). While there was some suggestion that lower 6-SMT levels were related to indoor and outdoor LAN exposures, higher levels of physical activity, and use of oral contraceptives, none of these relationships were statistically significant.

Conclusions: These preliminary analyses failed to identify any significant predictors of 6-SMT, beyond age. We are continuing to evaluate these relationships through more comprehensive modeling.