Artificial Light at Night and Cancer: Global Study

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Abstract

Background: Artificial light at night (ALAN) has been linked to increased risk of cancers in body sites like the breast and colorectum. However exposure of ALAN as an environmental risk factor and its relation to cancers in humans has never been studied in detail. Objective: To explore the association of ALAN with all forms of cancers in 158 countries. Materials and Methods: An ecological study encompassing global data was conducted from January to June 2015, with age-standardized rates (ASR) of cancers as the outcome measure. ALAN, in the protected areas, as the exposure variable, was measured with reference to the Protected Area Light Pollution Indicator (PALI) and the Protected Area Human Influence Indicator (PAHI). Pearson’s correlations were calculated for PALI and PAHI with ASR of cancers for 158 countries, adjusted for country populations, electricity consumption, air pollution, and total area covered by forest. Stratified analysis was conducted according to the country income levels. Linear regression was applied to measure the variation in cancers explained by PALI and PAHI. Results: PALI and PAHI were positively associated with ASR of all forms of cancer, and also the four most common cancers (p < 0.05). These positive correlations remained statistically significant for PAHI with all forms of cancer, lung, breast, and colorectal cancer after adjusting for confounders. Positive associations of PALI and PAHI with cancers varied with income level of the individual countries. Variation in all forms of cancers, and the four most common cancers explained by PALI and PAHI, ranged from 3.3 – 35.5%. Conclusion: Artificial light at night is significantly correlated for all forms of cancer as well as lung, breast, colorectal, and prostate cancers individually. Immediate measures should be taken to limit artificial light at night in the main cities around the world and also inside houses.

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KEYWORDS: Artificial light at night; lung cancer; breast cancer; colorectal cancer; prostate cancer

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