An epidemiological study of the risk of cycling in the dark: the role of visual perception, conspicuity and alcohol use

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Abstract

To curtail the rising numbers of cyclists seriously injured in road crashes, more insights are needed into the factors that contribute to these crashes. For instance, darkness is known to be associated with higher injury rates, but little is known about the relative influence of factors such as poor conspicuity, impaired perception and alcohol use among cyclists. To examine these factors, the present study analyzed the epidemiological crash data for three meteorological light conditions: daylight, late evening darkness and early morning darkness; for two crash types: crashes with (M-crashes) and without motorized traffic (NM-crashes); and for different age groups. The relative injury rates (injury risk per distance travelled in darkness corrected for daylight injury risks for each age group) confirmed findings from earlier studies that cycling in late evening darkness is associated with higher injury rates than cycling in daylight conditions. This is the case for both crash types with only small differences between the age groups suggesting that poor conspicuity (M-crashes) and impaired perception (NM-crashes) may play a role. In comparison to late evening darkness, relative injury rates in early morning darkness are much higher. This is the case for both crash types with large differences among the age groups, suggesting that in addition to the absence of daylight also age related risk factors are at play. Support for this hypothesis was found from the analyses of hospital records, showing that the

proportion of seriously injured cyclists who have been drinking is highest in early morning darkness and has strongly increased over the last decades. These insights provide input for the selection of countermeasures such as improved lighting (both street and bicycle lights) and interventions targeting alcohol use among cyclists.
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