Introduction: The pro-inflammatory cytokine interleukin-6 (IL-6) has received considerable attention in the regulation of a multitude of physiological processes, particularly for its immune response but also for its potential roles in sleep regulation, metabolism in adipose tissue, and in depressed patients. The increase in levels of IL-6 in the peripheral system has been shown to be related to depression. It was also observed that the nocturnal decrease in IL-6 was smaller in people who reported more negative mood or fatigue and greater in those who reported more uplifting events.
Objective: This epidemiological study aims to evaluate the influence of mood in the relationship between the amount of time of exposure to outdoor light and IL-6 levels.
Methods: This is a cross-sectional study. The 154 subjects (54 males), with mean age 43.5±12.8, living in a rural area in the south of Brazil. Chronobiological and light parameters were assessed using the Munich Chronotype Questionnaire (MCTQ). The MCTQ assesses actual sleep times, separately for work- and free days. Mid-sleep phase on free days (MSF) is calculated as the point of mid-sleep phase on a free day. As a refined chronotype assessment, MSF is corrected for sleep deficits accumulated during the work week (MSFsc). Sleep quality was assessed using the Pittsburgh Sleep Quality Index, and depressive symptoms were assessed with the Beck Depression Inventory (BDI). The levels of inflammatory cytokines (IL-2, IL-4, IL-6, IL-10, TNF-alpha and interferon) were assayed in plasma collected during the daytime.
Results: IL-6 showed a positive correlation with light exposure ($r= 0.257$; $p <0.001$) and a negative correlation with MSFsc ($r= -0.177$; $p= 0.028$). A multilinear regression analysis indicated that only time of light exposure was an independent factor predicting the level of IL-6 (ß= 0.26, $p= 0.002$). Non depressed subjects exposed to a different intensity of light did not interfere with IL-6 levels ($t= -1.6$; $p= 0.1$). However, when the two depressive groups with low and high light exposure were compared, the low exposure light group presented a lower level of IL-6 than the high exposure to light group ($t= -2.19$ and $p= 0.0037$).
Conclusion: The amount of time that participants are exposed to outdoor light is directly related to their IL-6 levels. Additionally, depressed subjects differ in their IL-6 levels if they are exposed to light for differing amounts of time.