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Diminished Rhinovirus (RV) Illness Severity Correlates with Increased Leukocyte Ascorbic Acid (AA) Levels. P.A. SHULT*, E.C. DICK, K.A. MINK, E. NORKUS, D. OLANDER, L.C.

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In three separate double-blind placebo-controlled trials, use of AA supplements (500 mg, q.i.d.) significantly reduced symptoms ($p < 0.001$) and signs [total mucous weight (MW), $p = 0.028$; coughs, $p = 0.046$] of illness in human volunteers ($n=24$) naturally exposed [J. Infect. Dis. 150:195 (1984); 156:442 (1987)] to RV type 16 (RV16). It also was found that individuals with greater levels of AA in their sera had significantly ($p = 0.009$) milder illness. However, since leukocyte AA levels are more representative of total body AA stores, the relationship of these levels to illness severity is likely of greater relevance and, thus, was analyzed thoroughly. In each of the above trials, 16 men free of RV16 antibody were given AA ($n=8$) or placebo ($n=8$) for 6 weeks. During week 3, these men were housed and interacted with 8 men with laboratory-induced RV16 colds. Blood was obtained weekly and mixed leukocytes (ML) or mononuclear (MONO) and granulocytic (GRAN) cells were purified for intracellular AA quantitation. Each day, symptom and sign severity scores were logged, nasal washings quantitated for virus, and used tissues collected for MW measurements (trial 3, only). When data from trials 1 and 2 were combined, a significant ($p = 0.025$, $n=32$, Spearman's rank correlation with Fisher method for combining results) inverse correlation between symptom severity scores and ML AA levels was found. This relationship was examined especially thoroughly in trial 3. Significant inverse correlations were found between symptom severity scores and AA levels in ML ($p = 0.032$) as well as GRAN ($p = 0.037$) and MONO ($p = 0.051$) cells. Total MWs were also significantly inversely correlated with ML ($p = 0.002$), GRAN ($p = 0.026$), and MONO ($p = 0.016$) AA levels. Surprisingly, there were no differences in any trial in the quantity and duration of virus shedding between AA and placebo recipients, nor was there any relationship between virus shedding and leukocyte AA levels. These results suggest that the amelioration of RV16 illness by AA supplementation is related to increased leukocyte AA levels but that AA may not be directly involved in those cellular immune functions related to virus clearance.

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