Active Hexose Correlated Compound (AHCC) research citations relating to influenza

(in date order, as of January 2013)

Beli E, Duriancik DM, Gardner EM, **Short-term supplementation with active hexose correlated compound improves the antibody response to influenza B vaccine**, *Nutr Res* (2012), http://dx.doi.org/10.1016/j.nutres.2012.11.001

Abstract

Administration of bioactive nutritional supplements near or at the time of immunization has been a recent approach to stimulate human immune response to vaccination. Active hexose correlated compound (AHCC), a mushroom extract, has been shown to protect mice against lethal primary influenza infection. Moreover, when AHCC was administered prevaccination in mice, they showed improved protection from lethal avian flu infection when compared to mice vaccinated alone. In this study, we hypothesized that AHCC will also improve the immune responses of healthy individuals to influenza vaccine. A randomized controlled study was performed with 30 healthy adults to evaluate the effects of AHCC supplementation on the immune response to the 2009-2010 seasonal influenza vaccine. Blood was drawn pre-vaccination and 3 wk post-vaccination. Immediately post-vaccination, the AHCC group began supplementation with AHCC (3 g/d). Flow cytometric analysis of lymphocyte subpopulations revealed that AHCC supplementation increased NKT cells ($P < .1$), and CD8 T cells ($P < .05$) post-vaccination compared to controls. Analysis of antibody production 3 weeks post-vaccination revealed that AHCC supplementation significantly improved protective antibody titers to influenza B, while the improvement was not significant in the control group. Overall, our study showed that AHCC supplementation improved some lymphocyte percentages and influenza B antibody titers over the control. Future studies are required to determine the kinetics of AHCC supplementation to improve the overall response to influenza vaccination.

Nogusa S, Gerbino J, Ritz BW, **Low-dose supplementation with active hexose correlated compound improves the immune response to acute influenza infection in C57BL/6 mice**, *Nutr Res.* 2009 Feb;29(2):139-43. doi: 10.1016/j.nutres.2009.01.005.

Abstract

Supplementation with mushroom-derived active hexose correlated compound (AHCC) modulates immunity and increases survival in response to a broad spectrum of acute infections, including influenza virus infection. However, dose-response data are nonexistent. Therefore, the aims of this study were to evaluate AHCC supplementation at various doses and determine the effects of low-dose supplementation on the immune response in a mouse model of influenza virus infection. We hypothesized that AHCC supplementation would influence the immune response to influenza infection in a dose-dependent manner. Male C57BL/6 mice were supplemented with AHCC at daily doses of 0.05, 0.1, 0.5, and 1 g/kg and infected intranasally with influenza A virus (H1N1, PR8). Supplemented mice demonstrated a dose-dependent increase in survival and reduction in the loss of body weight. To further evaluate the effects of low-dose AHCC supplementation on the immune response to influenza infection, mice were supplemented with 0.1 g/kg per day and infected with a sublethal dose of influenza virus. Supplemented mice exhibited enhanced virus clearance and decreased weight loss compared to controls. Low-dose supplementation did not influence total natural killer (NK) cell cytotoxicity, although lytic efficiency was increased in the spleens of AHCC-supplemented mice, indicating enhanced NK cell function per cell. In conclusion, these data suggest that the effects of AHCC on the immune response to influenza infection are dose dependent and that low-dose AHCC supplementation improves the response to influenza infection despite no effect on total NK cell cytotoxicity.

Ritz BW, **Supplementation with active hexose correlated compound increases survival following infectious challenge in mice**, *Nutr Rev*. 2008 Sep;66(9):526-31. doi: 10.1111/j.1753-4887.2008.00085.x.

Abstract

Active hexose correlated compound (AHCC) is a fermented mushroom extract that is promoted for immune support. This review focuses on results from in vivo studies evaluating the effects of AHCC supplementation on survival and the immune response to a variety of infectious agents, including influenza virus, avian influenza virus, Klebsiella pneumoniae, Candida albicans, Pseudomonas aeruginosa, and methicillin-resistant Staphylococcus aureus. Supplementation with AHCC appears to modulate immunity and increase survival in response to acute infection and warrants further investigation.

Ritz BW, Nogusa S, Ackerman EA, Gardner EM, **Supplementation with active hexose correlated compound increases the innate immune response of young mice to primary influenza infection**, *J Nutr*. 2006 Nov;136(11):2868-73.

Abstract

The emergence of H5N1 avian influenza and the threat of new or adapted viruses in bioterrorism have created an urgent interest in identifying agents to enhance the immune response to primary virus infection. Active hexose correlated compound (AHCC) is a natural mushroom extract reported to increase natural killer (NK) cell activity, survival, and bacterial clearance in young mice. However, the effects of AHCC on the response to viral infections have not been studied. In this study, young C57BL/6 mice were supplemented with 1 g AHCC/(kg body weight x d) for 1 wk prior to and throughout infection with influenza A (H1N1, PR8). Supplementation increased survival, decreased the severity of infection, and shortened recovery time following intranasal infection with flu, as determined by the recovery of body weight and epithelial integrity in the lungs. AHCC increased NK activity in lungs at d 1 ($P < 0.05$) and d 4 ($P < 0.01$) and in the spleen at d 2 postinfection ($P < 0.01$). Supplementation increased the percentage ($P < 0.05$) and number ($P < 0.01$) of NK1.1+ cells in the lung and reduced the infiltration of lymphocytes and macrophages compared with controls ($P < 0.01$). These data suggest that AHCC supplementation boosts NK activity, improves survival, and reduces the severity of influenza infection in young mice. Bolstering innate immunity with dietary bioactives may be one avenue for improving the immune response to primary flu infection.

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