Effect of taurine on modulation of intestinal anaphylactic response in β-Lactoglobulin sensitized Balb/c mice

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This study was led in order to evaluate taurine effect on modulation of intestinal anaphylactic response induced by beta-lactoglobulin (β-Lg), major allergen of bovine milk in Balb/c mice used as an animal model of allergy to cow’s milk proteins (ACMP). 42 Balb/c female mice were divided into 3 groups (n=14 each). The first group was untreated and represents the negative control (CL-), the second group was intraperitoneally sensitized with β-Lg and represents the positive control (CL+), the third group received for 15 days 100 mg/kg/day of taurine administrated intraperitoneally (Tau+) then sensitized intraperitoneally with β-Lg. Specific IgG anti-β-Lg were determined in the mice sera by an enzyme-linked immunosorbent assay (ELISA), and local anaphylactic responses were performed ex-vivo in Ussing chamber by intestine challenge with β-Lg. All animals were subjected to the challenge test in-vivo by i.p. injection (1mg/mouse) of β-Lg. Compared with sensitized mice, those treated with taurine have lower anti-β-Lg-specific IgG (1/16750th) (p<0.0001). The addition of β-Lg to the serosal side of the mouse intestinal epithelium in Ussing chamber produced electrogenic chloride (Cl-) secretion as shown by Isc stimulation (ΔIsc = 7.50 ± 3.34 μA/cm²) (ΔIsc = 17.54 ± 1.04 μA/cm²) respectively (p<0.001). Sensitized mice demonstrated also an enhanced epithelial permeability as measured by conductance (p<0.0001). Taurine treatment resulted in a significant decrease in secretory response. Signs of allergic reaction were less important in (Tau+) group, but it should be noted that 50% of the mice reached stade 4 after 30 minutes. A net increase in sera IgG anti-β-Lg titers was observed in (CL+) indicating a high immunogenicity of this protein. Also, a low production of IgG anti-β-Lg was observed in the (Tau+) suggesting that taurine plays an immunomodulation role. The stimulation with β-Lg in the mucosal side of tissue in the Ussing chamber was significantly decrease tissues of (Tau+) compared with (CL+), suggesting a decrease in local intestinal anaphylactic response. These findings provide evidence for the first time suggesting that taurine appears to reduce intestinal anaphylactic response, indicating protection from β-Lg-induced epithelial permeability increase.