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POSTER PRESENTATION Open Access

Comparison of the inhibitory effects of resveratrol and tranilast on IgE, 48/80 and substance P dependent-mast cell activation

A Catalli[1*], V Karpov[1], P Pundir[2], A Dimitrijevic[1], M Kulka[1,2]

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Background

Several health promoting effects have been attributed to the polyphenol resveratrol including anti cancer, anti-oxidant and anti-inflammatory activities.

Objective

We investigated the effects of resveratrol on LAD2 and $CD34^+$-derived mast cell activation in comparison to the known anti-allergy drug tranilast.

Methods

Degranulation was quantified by β hexosaminidase assay, and cytokine, chemokine and cysteinyl leukotrienes (cysLT) expression was measured by real time PCR and ELISA. Fura-2 Ca^{2+} imaging was employed to measure $[Ca^{2+}]_i$.

Results

In LAD2 cells, both resveratrol and tranilast (10 ug/ml) inhibited degranulation induced by mast cell activators IgE/anti-IgE (39% and 19%, respectively; P<0.03), compound 48/80 (9% and 6%), and substance P (23% and 28%; P<0.03). This may be attributable to modulation of Ca^{2+} levels, as resveratrol, and to a lesser extent tranilast, attenuated substance P-dependent increases in $[Ca^{2+}]_i$. Resveratrol and tranilast blocked cytokine formation, reducing substance P-induced TNF production (65%; P=0.04 and 46%; P=0.09, respectively), but not MCP-1 production. Furthermore, resveratrol inhibited FcepsilonRI mediated production of cysLT by 31% compared to control, whereas tranilast had no effect. The effects of resveratrol on degranulation and release of cysLT were more marked in human primary mast cells (HuMC) (64% and 90% inhibition, respectively; P<0.05), and the polyphenol was found to be significantly more efficacious than tranilast in these cells.

Conclusions

Resveratrol inhibited mast cell function at the level of degranulation, and cytokine and cysLT production, and was comparable, and in some cases, more potent than the anti-allergy drug tranilast. Thus resveratrol may be an effective therapeutic agent for the treatment of allergic disease.

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Author details

[1]National Research Council-INH, Charlottetown, PE, Canada. [2]University of Prince Edward Island, Canada.

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* Correspondence: Adriana.catalli@nrc-cnrc.gc.ca
[1]National Research Council-INH, Charlottetown, PE, Canada