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Title: Effects of water aerosol on pediatric allergic asthma

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Body: Objective: Ionized water aerosols have been suggested to exert beneficial health effects on pediatric allergic asthma. Their effect was evaluated in a controlled randomized clinical trial as part of a summer asthma camp. Methods: Asthmatic allergic children (n=54) spent three weeks in an alpine asthma camp; half of the group was exposed to water aerosol for one hour per day, whereas the other half spent the same time at a "control site". Immunological analysis, lung function and FeNO testing was performed during the stay, and sustaining effects were evaluated after 2 months. Symptom score testing was done over a period of 140 days. Results: The water aerosol group showed a significant improvement in all lung function parameters whereas the control group only in peak expiratory flow. All patients showed significant improvement in symptom score and significant decrease of FeNO after the camp. Only the water aerosol group exhibited a long lasting effect on asthma symptoms, lung function and inflammation in the follow-up examination. Induction of IL-10 and regulatory (Treg) cells was measured in both groups, with a pronounced increase in the water aerosol group. IL-13 was significantly decreased in both groups, whereas IL-5 and eosinophil cationic protein were decreased only in the water aerosol group. Conclusion: Our findings confirm the induction of Treg cells and reduction of inflammation by climate therapy. They indicate a synergistic effect of water aerosols resulting in a long lasting beneficial effect on asthma symptoms, lung function and airway inflammation.