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Title: Antioxidant activity of pomegranate juice reduces lung injury secondary to secondary to acute and chronic cigarette smoke exposure in an animal model

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Body: Cigarette smoke exposure (CSE) creates an increased oxidative burden in the lungs. Pomegranate (*Punica granatum* L.) Juice (PJ) possesses potent antioxidant activities that are attributed to its polyphenols. The study aims to determine the effects of PJ supplementation on the damaging effects of acute and chronic CSE in an animal model. **Methods:** Male C57BL/6J mice were divided to four different groups: control, CSE, CSE + PJ and PJ. CSE groups received daily exposure, 5 days per week, for different time points (3 days, 1 and 3 months). PJ groups received daily 80 μmol /kg while other groups received placebo. At the end of the experiments, different parameters were studied: a) oxidative stress (OS), c) histological evaluation of the lung by H&E, d) apoptosis using TUNEL assay, and e) expression levels of IL-1 beta, IL-6 and TNF-alpha by RT-PCR method. **Results:** Acute exposure (3 days): A significant increase in OS, IL-1 beta, IL-6, TNF-alpha expression was noted in the CSE only group when compared to control. PJ significantly reduced OS and the expression of inflammatory mediators. TUNEL staining demonstrated significant apoptosis in CSE lungs, which was diminished in the CSE + 80 μmol PJ group. **Chronic exposure (3 months):** Lung sections demonstrated multifocal alveolar emphysematous changes that were significantly reduced in the CSE + PJ group. **Conclusion:** In this animal model, exposure to CSE resulted in lung injury. PJ supplementation attenuated the expression of inflammatory mediators observed in the acute CSE animal model and reduced emphysematous changes noted in the chronic animal model.