



Lead Acetate Induces Epithelium-Dependent Contraction of Airway Smooth Muscle

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Abstract: The effect of lead acetate on tracheal smooth muscle (TSM) of dog pups was investigated in this study. In addition we studied the role of epithelium and involvement of nitric oxide (NO) in counteracting the effects of lead acetate on TSM as well as the modifying effects of lead acetate on contractile responses of TSM to acetylcholine (ACh). Tracheal rings were excised and placed in *in vitro* organ baths. In vitro administration of lead acetate in increasing concentrations (10^{-7} – 10^{-3} M) induced concentration-dependent contraction of TSM. Prior treatment of tissues with a single dose of lead acetate increased the contractile responses of TSM to acetylcholine (ACh) (10^{-10} – 10^{-6} M). In additional tracheal rings the epithelium was denuded, then preparations were treated with lead acetate. Denudation of the epithelium resulted in an increase in lead acetate-induced contraction of TSM. Another set of tracheal rings were preincubated in bathing medium containing bradykinin (BK, 0.4 mM), to activate NOS. Presence of BK reduced contractile responses of TSM to lead acetate. Our data suggest that subacute exposure to lead, induces epithelium-dependent contraction of airway smooth muscle (ASM) probably via modulation of nitric oxide (NO) release.

Keywords: *airway smooth muscle, contraction, epithelium, lead acetate, nitric oxide, tracheal smooth muscle.*

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