

EFFECT OF ANAPHYLACTIC MEDIATORS, ACETYLCHOLINE AND β -ADRENERGIC BLOCKADE UPON CALCIUM HYPERSENSITIVITY IN AIRWAYS SMOOTH MUSCLE. E. B. Weiss. Saint Vincent Hospital, Worcester, Massachusetts.

We have reported an increased isometric tension response in guinea pig trachealis smooth muscle (TSM) at subphysiologic extracellular calcium (Ca^{++}) concentrations following in-vitro anaphylaxis (ANA); passively sensitized TSM failed to exhibit this response (Respiration, In Press, 1980). Aspects of the mechanism are now presented. The experimental model consists of zero Ca^{++} immersion and then Ca^{++} replacement at 0.375 and 2.52 mM Ca^{++} in Krebs-Henseleit buffer, first under control and then egg albumin-induced ANA conditions in a paired sequence using the same TSM. Following ANA, ANA mediators are eluted. Data is expressed as percent tension \pm SE, (paired t) of 0.375 mM Ca^{++} to force at 2.52 mM Ca^{++} . For controls 0.375 mM Ca^{++} was $32.1 \pm 3.2\%$ vs. $50.5 \pm 2.3\%$ following ANA ($n = 32$, $p < 0.001$). After determination of control 0.375 + 2.52 mM Ca^{++} responses, normal TSM were incubated one hour with either acetylcholine (ACH) 1 ug/ml, propranolol (Pr) 10 ug/ml, histamine (H) 2 ug/ml, or $\text{PGF}_{2\alpha}$ 1 ug/ml. After mediator elution, Ca^{++} responses were re-assayed. No mediator alone, or in combination, induced any calcium-TSM tension hyperresponse: Control $37.6 \pm 2.2\%$ vs. ACH incubation $24.8 \pm 4.9\%$ ($p < 0.01$, $n = 18$); control $17.2 \pm 2.2\%$ vs. propranolol $26.6 \pm 5.3\%$ ($P > 0.2$, $n = 12$); control $23.4 \pm 2.5\%$ vs. histamine $15.4 \pm 2.1\%$ ($p < 0.02$, $n = 16$); control $24.1 \pm 6.8\%$ vs. $\text{PGF}_{2\alpha}$ $28.5 \pm 5.2\%$ ($p > 0.3$, $n = 12$); control $43.3 \pm 2.8\%$ vs. Pr + H + $\text{PGF}_{2\alpha}$ $39.7 \pm 3.4\%$ ($p > 0.4$, $n = 17$). In a separate experiment, each mediator was added during ANA for 30 minutes followed by elution, zero Ca^{++} immersion and Ca^{++} replacement. A response equal to or greater than ANA was seen in each case. Cited substrates do not induce passive or resting Ca^{++} hyperresponse in isometric tension to non-ANA TSM. They may potentiate Ca^{++} -tension hyperresponse following ANA. (Supported by the Foundation for Research in Bronchial Asthma and Related Diseases and Biomedical Research Grant #5-S07RR05660-03.