SODIUM DEPENDENCE OF OUABAIN-INDUCED NORADRENALINE OUTPUT FROM GUINEA-PIG VAS DEFERENS

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The mechanism of noradrenaline output induced by ouabain from isolated guinea-pig vas deferens was investigated.

1) Exposure of vas deferens to ouabain (10^{-4} M) caused an increase in noradrenaline output. 2) Total noradrenaline output induced by ouabain increased with increasing the concentration of extracellular Na^{+}. 3) Tetrodotoxin (1.56×10^{-6} M) retarded and reduced ouabain-induced response. 4) Transmural nerve stimulation (16 Hz, 40 V, 0.5 msec, for 20 sec) facilitated the effect of ouabain. 5) Monensin (10^{-5} M) accelerated the development of the response, though the maximum value was reduced. 6) When Ca^{2+} was replaced by Ba^{2+} or Sr^{2+} in the incubation medium, ouabain caused a larger and faster increase in the noradrenaline output. 7) Sodium dependence and the effects of tetrodotoxin and monensin were also seen in the ouabain-induced response in the presence of Ba^{2+} or Sr^{2+}, but the influence was to a lesser extent than that in the presence of Ca^{2+}.

These results show that ouabain causes an increase in noradrenaline output from the sympathetic nerve terminals partly through the tetrodotoxin-sensitive mechanism in which Ca^{2+} can be substituted by Ba^{2+} or Sr^{2+}.