

in late pregnancy could explain the embryotoxicity characterized in Eriksson's experiments by haemorrhages.

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Factors influencing the response of the mouse vas deferens preparation to noradrenaline

Jones & Spriggs (1971) reported the relative insensitivity of the mouse isolated vas deferens preparation to most common agonists though the tissue responded well to transmural electrical stimulation. This surprised us as for some time we have been satisfactorily determining noradrenaline dose-response curves on mouse vas deferens. The experimental technique used by Jones & Spriggs (1971) differed in a number of respects from ours e.g. they stripped off the serous coat—we did not; they worked at 32°, we at 35·5°, but probably the most significant difference was their use of Huković solution (NaCl 114, KCl 4·70, CaCl₂ 2·54, MgSO₄ 1·19, NaHCO₃ 25·00, KH₂PO₄ 1·19, glucose 11·5 mM: Huković, 1961) while we preferred McEwen solution (NaCl 130, KCl 5·65, CaCl₂ 2·16, NaHCO₃ 25·0, NaH₂PO₄ 0·92, glucose 11·1, sucrose 13·1 mM: McEwen, 1956). The most noticeable difference between these two physiological saline solutions is the absence of MgSO₄ from McEwen solution and we have therefore investigated the effect of this salt on the response of the mouse isolated vas deferens preparation to noradrenaline.

Vasa deferentia were removed from freshly killed mice (Tuck No. 1 strain, 12 weeks old, 20–30 g weight) and suspended in an organ bath at 35·5° in either Huković or McEwen solution gassed with 5% carbon dioxide in oxygen. Changes in length of the tissues in response to (—)-noradrenaline (Koch-Light, Ltd.) and to transmural stimulation (5 s trains of 0·2 ms duration 40 V rectilinear pulses applied at 50 Hz through parallel platinum wire electrodes) were recorded isotonicly (load 150–200 mg).

In McEwen solution the tissues responded well to both transmural stimulation and exogenous noradrenaline (Fig. 1) and since the length of the vas deferens was usually between 20 and 30 mm, the maximal response of 8–14 mm represents a considerable shortening. In Huković solution the tissues responded less well and this difference is probably due to the presence of MgSO₄ since tissues suspended in McEwen solution

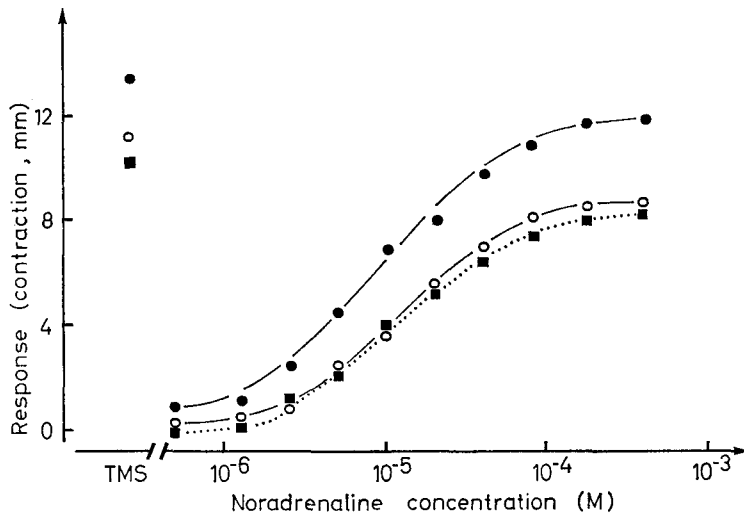


FIG. 1. Showing mean response (mm contraction) of mouse isolated vas deferens to transmural stimulation (TMS: 5 s trains of 0.2 ms duration 40 V rectilinear pulses applied at 50 Hz through parallel platinum wire electrodes) and to noradrenaline (M) when suspended in McEwen solution (●—●), Huković solution (■.....■), or McEwen solution plus 0.5 mM MgSO₄ (○—○). Standard errors have been omitted for simplicity but some are shown below:

Noradrenaline concn (M)	McEwen (n = 17)	Huković (n = 12)	McEwen + 0.5 mM MgSO ₄ (n = 12)
5×10^{-6}	4.56 ± 0.85	2.20 ± 0.13	2.20 ± 0.41
2×10^{-5}	8.81 ± 0.30	5.47 ± 0.22	5.51 ± 0.64
8×10^{-5}	11.04 ± 0.29	7.55 ± 0.21	8.06 ± 0.52

with added MgSO₄ (0.5 mM) also responded less well (Fig. 1). The Mg²⁺ ion is probably responsible for this effect since it was still seen when MgCl₂ (0.5 mM) was substituted for MgSO₄ but was not seen when Na₂SO₄ (0.5 mM) was added to normal McEwen solution. We have no evidence to account for this action of the Mg²⁺ ion but it is interesting to note that since this work was completed, Takagi, Takayanagi & Liao (1972) have observed a similar effect in rat vas deferens.

Although the depressant action of Mg²⁺ is highly significant statistically, the magnitude of the effect is not large and probably does not account entirely for the lack of response seen by Jones & Spriggs. However, in a small number of experiments in McEwen solution utilizing vasa deferentia from older mice (30 weeks or more) responses to noradrenaline were obtained which were only 20–25% of those seen in the younger animals though the tissues still responded well to transmural stimulation. Differences in experimental conditions may therefore explain the discrepancy between our results and those of Jones & Spriggs (1971).

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