During pregnancy, e.m.g. tests indicated that the mother was overtreated with pyridostigmine (mestinon) and measurements with ^{14}C-labelled pyridostigmine showed that she excreted this drug more slowly than other myasthenic patients.

The diagnosis of drug-induced neonatal myasthenia due to placental transfer of pyridostigmine was made on the basis of the low level of plasma cholinesterase in maternal and cord blood, the onset of symptoms 24 hr after birth and the decreasing requirement for neostigmine.

Pyridostigmine has two actions, inhibition of cholinesterase activity and interaction with acetylcholine receptors. It is suggested that sufficient pyridostigmine was transferred so that at birth it produced neuro-muscular depression which was offset by inhibition of endplate acetylcholinesterase. It is postulated that the anticholinesterase action of the retained pyridostigmine or its metabolites has a shorter duration than the depressant action and that 24 hr after birth depression is dominant. The course of neostigmine therapy served to maintain inhibition of cholinesterase activity during the slower recovery from depression.

Some effects of sympathomimetic amines on isolated smooth muscle preparations from the stomach of the guinea-pig

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Strips of smooth muscle from the wall of the stomach of the guinea-pig were prepared by cutting parallel to the lesser curvature (longitudinal muscle) or at right angles to the lesser curvature (circular muscle). Motor responses of the strips were greatly enhanced after removal of the mucosa by separating the tissues of the stomach wall at the level of the submucosal connective tissue.

All preparations showed some spontaneous activity when suspended in Krebs solution at 39° C, gassed with 95% oxygen and 5% carbon dioxide. Most preparations possessed some degree of tone as defined by their ability to relax in the presence of isoprenaline.

Responses to isoprenaline (0.1–10 μg/ml.) were antagonized by the β-receptor blocking drugs, propranolol (1.0 μg/ml.) or 4-(2-isopropylamino-1-hydroxyethyl) methane sulphonanilide HCl, Mead Johnson 1999 (10 μg/ml.).

Adrenaline or noradrenaline (0.1–5.0 μg/ml.) caused either a relaxation, a contraction, or most commonly a biphasic response in which a relaxation was followed by a contraction. On analysis with α- and β-receptor blocking drugs the responses appeared to involve an inhibitory component mediated via β-receptors and an excitatory component mediated via α-receptors.

Metabolic actions associated with stimulation of α- and β-receptors for adrenaline in smooth muscle

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The relaxing action of the catecholamines in intestinal smooth muscle is mediated by both adrenergic α- and β-receptor mechanisms (Ahlquist & Levy, 1959; Jenkinson &

Morton, 1965). In taenia coli from the rabbit or guinea-pig, isometrically contracted by carbachol, isoprenaline in low concentrations ($<7\times10^{-7}$ g/ml.) selectively relaxed the muscle by stimulating β-receptors. The effect was selectively blocked by MJ 1999 ($5–12\times10^{-6}$ g/ml.). In higher concentrations ($>1\times10^{-6}$ g/ml.) isoprenaline also stimulated α-receptors and the effect was blocked by a combination of MJ 1999 and dibenamine ($0.5–1\times10^{-6}$ g/ml.). Phenylephrine in low concentrations ($0.25–1.25\times10^{-6}$ g/ml.) selectively relaxed the muscle by stimulating α-receptors; in higher concentrations ($>1\times10^{-6}$ g/ml.) phenylephrine also stimulated β-receptors. In taenia coli from the rabbit, adrenaline in the lowest active concentration (2×10^{-8} g/ml.) relaxed the muscle by stimulating β-receptors. In taenia coli from the guinea-pig adrenaline stimulated α-receptors in the lowest active concentration (1.6×10^{-8} g/ml.). The relaxation mediated by α-receptors was more rapid and complete than that mediated by β-receptors.

In taenia coli from the rabbit the relaxing effect mediated by β-receptors was potentiated by theophylline (7.5×10^{-5} g/ml.) and selectively blocked in glucose-free solution. It was still present in K^+-depolarized muscle. The relaxing effect was in time preceded by a fall of the content of adenosine triphosphate (ATP) and creatininephosphate (CrP) of the muscle, an increase of the phosphorylase-*a* activity, and an increase of the hexosephosphates (G-1-P, G-6-P, F-6-P) and lactate levels of the muscle. All these metabolic actions and the relaxing effect were blocked by β-receptor blocking agent. The relaxing and metabolic effects of isoprenaline was mimicked by treating the muscle with dinitrophenol (4×10^{-5}M). (ACTH (0.15 i.u./ml.) relaxed the taenia coli of the rabbit via β-receptor like mechanism.

The relaxing action mediated by α-receptors was not potentiated by theophylline of associated with any changes of the ATP or CrP level of the muscle or influence on the carbohydrate metabolism. It was selectively blocked by procedures tending to eliminate the concentration gradient of K^+-ions over the cell membrane or decrease the K^+ permeability of the membrane. The relaxing action was thus blocked in K^+-depolarized or cold treated muscle. The effect was also inhibited after treating the muscle by digitalis glycosides (1×10^{-4}M) or desoxycorticosterone (1×10^{-5}M) for 60–120 min.

It is suggested that the relaxing action mediated by β-receptors is dependent on a metabolic action probably mediated by cyclic AMP. The relaxing action mediated by α-receptors is probably dependent on a selective increase of the K^+-permeability of the cell membrane as suggested by Jenkinson & Morton (1965).

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A hyoscine-resistant contraction of the chicken isolated oesophagus to stimulation of the vagus and descending oesophageal nerves

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Isolated oesophageal preparations with vagus and descending oesophageal nerves attached were made from young and adult chickens (Bartlet & Hassan, 1968a), and the contractions of the longitudinal muscle recorded isotonically. The preparations were suspended