THE EFFECT OF EXOGENOUS NO ON THE RESPONSES OF THE NON-PREGNANT HUMAN MYOMETRIUM TO ENDOTHELIN-1

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Numerous studies have provided evidence for the involvement of endothelins in the contraction of various smooth muscles including the blood vessels and the uterus. The physiological effects of endothelins are mediated by at least two types of G-protein-coupled receptors, ETA and ETB. It has been demonstrated that the uterus contains a predominance of endothelin ETA receptors. In the human uterus, endothelin-1 induces two types of contraction, one that increases spontaneous contractile activity, and one that increases basal tone.

Nitric oxide (NO) is a multifunctional molecule that mediates a range of physiological processes. It is known to be a strong relaxant of smooth muscles, including the myometrium. NO relaxes smooth muscle cells by the modification of several intracellular processes. This study was performed to examine the effect of endothelin-1 on human non-pregnant myometrium, and to examine the effect of nitric oxide on contractile responses to endothelin-1 in the human myometrium.

Specimens of the myometrium were obtained from non-pregnant women (n=5), aged 39 – 48 years, undergoing hysterectomy for benign gynaecological disorders. The responses of the non-pregnant human myometrium to endothelin-1 in the absence and presence of a nitric oxide donor (DEA/NO) were recorded under isometric conditions. The responses were quantified by calculation of under-curve area, amplitude, basal tone and frequency of the contractions.

The present study showed that endothelin-1 enhanced spontaneous contractile activity of the human non-pregnant myometrium by increasing the basal tone and frequency of contractions in a concentration-dependent manner.

Preincubation with exogenous NO (donated by DEA/NO), did not prevent an endothelin-1-induced increase in the contractile activity of the uterine strips.