Influence of leukotriene receptor antagonist on contractile activity of the porcine uterine smooth muscle in the luteal phase and in early pregnancy

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Abstract

This study analysed the influence of montelukast (MON; 10⁻⁸ - 10⁻⁴ M), a cysteinyl leukotriene receptor 1 (CysLTR1) antagonist, on the contractility of the porcine uterine smooth muscle in the luteal phase of the oestrous cycle (n=8) and in early pregnancy (n=8). Stimulation of uterine strips in the luteal phase with MON has been shown to significantly reduce the amplitude of contractions, but not to affect the tension or frequency of contractions. A statistically significant tension increase and decrease in the frequency and amplitude of contractions was observed in pigs in early pregnancy. This suggests that MON has a different effect on the parameters under study in cyclic and pregnant pigs.

Key words: montelukast, cyclic pigs, early pregnancy, uterine contractility

Introduction

Leukotriene receptors were found in the endometrium and myometrium in humans (Corriveau et al. 2014), cattle (Korzekwa et al. 2016), horses (Guzeloglu et al. 2013) and pigs (Jana et al. 2015). Leukotrienes (LTs) C₄ and D₄ were shown to increase the contractility of uterine muscles in guinea pigs (Weichman and Tucker 1982) and in pigs (Ledwozyw and Kadziolka 1989) and to modulate the uterine contractility in pregnant women (Corriveau et al. 2010). In physiological conditions, LTs regulate the function of ovarian follicles and corpus luteum (Blair et al. 1997) and affect the process of embryo implantation (Pakrasi et al. 1985). The time between the 12th and the 14th day of pregnancy in pigs is known to be of key importance for successful implantation, which is associated with the uterus motility and is particularly important for embryo migration.