Role of CPI-17 on uterine smooth muscle contraction depending on pregnancy stage

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Background Smooth muscle contraction is regulated by the balance between MLC kinase and MLC phosphatase (MLCP). Phosphorylated CPI-17 can inhibit MLCP resulted in induce contraction. **Aim** This study was planned to elucidate the effect of CPI-17 on contraction in myometrium from non-pregnant and pregnant mice. Wild type C57BL6/J mice (WT), CPI-17 deficient mice (KO) and phospho-inactive mutant CPI-17 at T38 to alanine knocked-in mice (TA) were used. **Methods** Isometric force stimulated with high concentration (65.4 mM) of KCl (high K), oxytocin (Oxy; 100 nM) and Carbachol (CCh, 5-100 μM) from non-pregnant and pregnant mice. **Results** The spontaneous contraction and absolute contractile ability stimulated with CCh and high K^+ were not difference in non-pregnant and pregnant myometrium isolated from WT, KO and TA. In non-pregnant myometrium, Oxy induced spontaneous rhythmic contraction with small sustained one in WT. Oxy induced persistent weaker contraction in KO and TA than WT. On the other hand in pregnant myometrium, the Oxy-induced contractions were tended to be smaller in TA and KO than WT. **Conclusion** PKC/CPI-17 pathway induces an important role to regulate contraction by Oxy but not by CCh in both non-pregnant and pregnant myometrium. CPI-17 may be important in normal parturition induction.