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ALPHA-LIPOIC ACID VAGINAL ADMINISTRATION CONTRASTS INFLAMMATION AND PRETERM DELIVERY IN RATS

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Objective(s): To evaluate tissue distribution following vaginal administration of Alpha-lipoic acid (ALA) (Exp. I), impact on implantation process (Exp. II), and effectiveness of prolonging pregnancy duration in induced preterm birth (Exp. III) in an experimental rat model.
Study Design: In Exp. I female Wistar rats were treated for 4 days with low (50 mg/kg) or high dose (500 mg/kg) alpha-lipoic acid intravaginally, or with a physiologic solution as control . Uterine and cervical tissues were evaluated by immunohistochemical analyses for ALA distribution. In Exp. II, three groups of rats were treated for 5 days, with low or high dosages intravaginally; rats were mated and, if pregnant, implantation rate as well as the content of implantation mediators such as VEGF and Î±-SMA were evaluated by immunohistochemical analyses. In Exp. III, pregnant female Wistar rats were induced to preterm delivery with mifepristone and PGE2. A pre-treatment with placebo (positive control) or vaginal alpha-lipoic acid, at low or high dose, was performed. A group of animals with normal spontaneous delivery was used as control. The delivery time was recorded and mRNA levels by Real-Time PCR and immunohistochemical analyses of pro-inflammatory cytokines (TNF-Î±, IL-1 Î² and IL-6) in the uterine tissues were performed.
Results: Vaginally administered Alpha-lipoic acid was well absorbed and distributed in uterine and cervical tissues. Implantation rate or its physiological markers (VEGF and Î±-SMA) were not affected. Alpha-lipoic acid was able to significantly delay the delivery time and to decrease mRNA synthesis and release of pro-inflammatory cytokines (TNF-Î±, IL-1 Î² and IL-6).
Conclusion(s): When administered intravaginally, Alpha-lipoic acid was able to reach uterine tissue, delay preterm delivery induced by mifepristone and PGE2, also counteracting the production of inflammatory molecules. These results provide new insight on alpha-lipoic acid and alternative therapies for preterm delivery.

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