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Localization and distribution of aquaporin 2 in different stages of pregnancy in queen reproductive tract
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Aquaporin 2 (AQP2) location has been previously described in human and mouse endometrium, being specifically found in the glandular and luminal epithelium. An important correlation with steroid hormones like estradiol and progesterone concentration has been also described (1). The aim of the present study was to determine the location of (AQP2) in the queen uterus and placental transference zone (TZ) through different gestational phases. Forty-two queens were included in the present study. After being ovariohysterectomized, queens were grouped in non-ovulated (LP; n=8), ovulated (HP; n=8), 30 (D30; n=8), 40 (D40; n=5), 50 (D50; n=4) and 60 days (D60; n=9) of pregnancy, and a uterine sample from every queen was obtained. Biopsies of placental transfer zone were also obtained from pregnant queens at D30, D40, D50 and D60. Biopsies were de-waxed and immersed in a citrate buffer at 96º for 20 minutes for antigen retrieval. Sections were blocked with 5% bovine serum albumin (BSA) for 1 hour and then incubated overnight in a humidity chamber with a Rabbit polyclonal antibody against AQP2. Sections were then washed and incubated with an Alexa Fluorocrome 647 anti-rabbit. Results were evaluated with a confocal SP5 microscope. AQP2 was expressed in the glandular and luminal epithelium and also in the muscular cells of the myometrium in every stage evaluated. The fluorescence expression decreased in the glandular epithelium as pregnancy progresses while it increased on the myometrium and luminal epithelium. On the TZ of pregnant queens, AQP2 was located in the chorionic labyrinth cells increasing its fluorescence as pregnancy progresses. To our knowledge, this is the first time that AQP2 has been immunologically described in the queen reproductive tract. It has been shown that progesterone is involved in the up-regulation of AQP2 secretion in human endometrium (2). In queens, TZ shows more fluorescence expression than the uterus zone as pregnancy progresses maybe because of the invasion of the chorion on the maternal layers of the uterus, suggesting that hydrologic balance is important for the conceptus development. Also the expression in the luminal epithelium increases when progesterone increases while glandular fluorescence decreases bringing to mind a possible role in receptivity of the uterus. Further studies are needed on this water channel as well as other AQPs to explore more about their function, specificity, and importance.