

## Effects of deslorelin implants on ovarian cysts in guinea pigs

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Ovarian cysts are one of the most common gynaecological diseases in female guinea pigs. Prevalence in literature is different and varies between 30% (Sommerer et al., 2004) and 90% (Hamel, 2002). Proof and size of cysts are significantly correlated with increasing age of the animals (Sommerer et al., 2004). The etiology of the formation of the cysts in female guinea pigs is unknown, although several theories exist. Beregi et al. (1999) and Hamel (2002) observed an increased incidence in animals kept alone. Besides, the uptake of estrogenic substances is thought to be a risk for the development of ovarian cysts (Quesenberry, 2004). Sommerer et al. (2004) showed that the incidence of cysts is also increased in obese animals, whereas Shi (2002) reported that hormonal imbalances, namely defects in inhibin-FSH regulation, are responsible for cyst development.

Clinical manifestations of ovarian cysts may vary. Due to their dimension, hormonal inactive cysts can cause secondary problems concerning the gastrointestinal- and respiratory system. Affected animals are often cachectic and show a characteristic pear-shaped abdomen (Beregi et al., 1999). Hormonal active ovarian cysts occur to a minor extent. Due to the hyperestrogenism, affected animals often show a bilateral alopecia as well as a pancytopenia. Changes in behavior like aggressiveness or permanent heat are rare (Ewringmann and Glöckner, 2005).

As therapeutic measures, some authors described manual crushing or percutaneous puncture of cysts using ultrasound control as well as hormonal treatment using gonadotropin releasing hormone (GnRH) agonists or human chorion gonadotropin (hCG). GnRH-preparations in general induce LH and FSH release which in turn generate growth, maturation and luteinization of the follicles, respectively. Regardless of the treatment method recurrence is common (Ewringmann and Glöckner, 2005). Therefore the treatment of choice is ovariohysterectomy or ovariectomy. However, it should be considered that the risk of anaesthesia and surgery is increased in older and ill animals.

As the use of a slow-release GnRH implant for the treatment of ovarian cysts in guinea pigs has not been described yet, the aim of this study was to test the efficacy of the GnRH agonist slow release implant Suprelorin®

for treatment of ovarian cysts in guinea pigs. The physiological pulsatile GnRH secretion results in stimulation of the pituitary-gonadal axis and leads to an increase of the number of GnRH receptors on the target organs (up-regulation). The permanent, non-pulsatile release of high concentrations of GnRH by the slow-release implant results in a short-term stimulation of the pituitary gland followed by subsequent desensitization and reduction of peripheral receptors (down-regulation). Therefore, slow-release GnRH implants have been successfully used for the suppression of reproduction in the dog, ferret and the cat, both male and female (Schoemaker et al., 2008; Goericke-Pesch and Wehrend, 2009; Goericke-Pesch et al., 2010).

For our investigation, 11 nulliparous female guinea pigs were used (age of all animals varied between 4 and 7 years; weight between 500 and 750 g. An ultrasound examination was done to proof the presence of ovarian cysts (enclosed cavities with thin epithelial wall and liquid or semi-liquid filling). Animals with ovarian cysts with a minimum area of 0.5 cm<sup>2</sup> were included in the treatment group (n = 7). The remaining four female guinea pigs had ovarian cysts with a maximum area of 0.3 cm<sup>2</sup> and served as untreated controls. All animals of the treatment group received one slow release GnRH agonist implant containing 4.7 mg deslorelin subcutaneously (Suprelorin®, Virbac, Bad Oldesloe, Germany) between the shoulders with the included applicator. The treated guinea pigs were examined weekly until week 8 and in week 16 to detect changes in the size of ovarian cysts by ultrasound.

Our investigation revealed that the size of the ovarian cysts in all guinea pigs did not vary significantly during the treatment. At the implantation site, no adverse effects as redness, swelling or scratching, were observed.

### Discussion

Short-acting GnRH agonists have been used for the treatment of ovarian cysts in female guinea pigs; but, success rates described earlier were disappointing (Hamel, 2002; Göbel and Ewringmann, 2005). The aim of this report was to test for the influence of continuous slow release of

GnRH agonists on ovarian cysts, using the implant Suprelorin® is licensed for the use in male dogs. It is generally accepted that continuous, instead of pulsatile GnRH secretion results in an initial stimulation of the pituitary gland which is followed by a downregulation of pituitary GnRH receptors (Dube et al., 1987). The idea was that the initial stimulation might induce ovulation or luteinisation of the ovarian cysts, respectively although it has been known, that the localization and physiological activity of GnRH and its receptors in guinea pigs differ there of from other mammalian GnRH (Grove-Strawser et al., 2002). Our study showed that treatment with the slow release GnRH-agonist implant Suprelorin® did not influence the size of ovarian cysts in coincidentally selected guinea pigs. It was not possible to castrate the animals used at the end of the treatment because of missing compliance of the owners, no histopathological examination could be done to specify the cyst type. Further studies are necessary to investigate the effect of slow release implants on reproduction in female and male guinea pigs.

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