# Pseudopregnancy in bitch. How to support the owner and the animal?

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Almost every owner of an unspayed female dog must have experienced at least once the symptoms of pseudopregnancy in their pet. These symptoms, even if sometimes significantly different in terms of their intensity and duration, always cause worries and in most cases make the owner seek advice at a veterinary surgery. Even though the most effective solution to this problem remains hormonal therapy, many owners search for other solutions which will be either more "natural" or economically beneficial.

## Introduction

Pseudopregnancy always accompanies the long luteal phase in unspayed and not pregnant female dogs. It is a physiological condition, typical for canine and results mainly from a specific course of the reproduction of free-living animals representing this genus.  In free-living packs of canines it is only one female dog (the alpha female) which is really pregnant, while other females are psudo-pregnant in order to prepare their lactation for the time when the alpha female delivers.  Thus the pack protects itself in the case the alpha female is too weak after the labour to take care of the newborns or she becomes an easy target for other predators. In such situations other females in the pack begin their lactation exactly at the moment of the labour (the canine luteal phase always lasts for more or less the same period of time irrespective of whether the female is really or pseudo-pregnant) and they act as "wet nurses" thanks to which the little ones increase their chances of survival even  if their biological mother dies.  It is a natural way of securing the pack and guaranteeing its survival in the habitat if the alpha female dies.

## Symptoms and background

Despite the fact that the majority of currently maintained female dogs do not live in packs, the biology of the canine reproductive system remains the same as in the natural environment, which means that in every unspayed female dog after heat and ovulation the symptoms of pseudopregnancy may develop and approximately two months after ovulation they cause lactation. However prior to the lactation, the owners observe a gradual growth of the mammary gland and alterations in the behaviour of the animal which becomes anxious and starts to nest. Her behaviour is the same as if she was in late pregnancy. The dog is anxious, doesn't want to leave the house and is

sometimes aggressive. She licks the abdominal area and sometimes substantial quantities of milk occur in the mammary glands. And even though in most cases those symptoms disappear naturally after a few weeks, many owners who do not know the physiological background of the functions of the reproductive system in canine females attribute them to serious health issues, because a female which has not mated, should not behave as if she was pregnant.

From a physiological perspective, the occurrence of the symptoms of pseudopregnancy in female dogs is caused by an elevated level of progesterone during the luteal phase irrespective of whether or not the bitch is pregnant. The high level of progesterone lasts for half of a typical pregnancy that is for about a month, after which it gradually begins to drop. This decrease in the level of progesterone triggers the production of prolactin, whose high level may cause the symptoms of pseudopregnancy. However, the above-mentioned symptoms do not occur in all bitches with the same intensity and the breeds particularly prone to pseudopregnancy include for example the Afghan Hound or the Basset Hound.

Treatment

Even though the symptoms of pseudopregnancy subside naturally within a few weeks, for many owners they are so troublesome that they demand a pharmacological treatment. As it is an elevated level of prolactin which is responsible for the symptoms, the causal treatment of the symptoms of pseudopregnancy involves the use of anti-prolactin substances. Since the release of prolactin is regulated by the activation or inhibition of dopamine receptors, the pharmacological treatment of pseudopregnancy involves the application of dopamine agonists such as bromocriptine and cabergoline. They are alkaloids isolated from ergot fungi with cabergoline being a derivative of ergoline and bromocriptine a semi-synthetic derivative of ergocryptine. They are very strong dopamine receptor agonists and thus they impede the release of prolactin by the pituitary gland which inhibits the symptoms of pseudopregnancy. The anti-prolactin properties of those active substances are commonly known, because on the market there are preparations containing cabergoline or bromocriptine which have been proved effective in eliminating the symptoms of pseudopregnancy in female dogs. Diterpenes, found in the extract of *Vitex-agnus castus* which may inhibit lactation, have similar agonistic properties on dopamine receptors. *In vivo* and *in vitro* tests showed that Vitex impedes the release of prolactin and binds with dopamine receptors (Jarry et al., 1994, Sliutz et al., 1993; Wuttke et al., 2003) as well as inhibiting the secretion of prolactin in rats (Wintherhof, 1993) and humans. The application of metargoline may also be effective as it is a serotonin antagonist and shows anti-prolactin properties.

In many natural products designed for female dogs with the symptoms of pseudopregnancy there are also substances which are supposed to act on the symptoms, for example they show diuretic and antiedemic properties. Their application is intended to cause the body system responsible for water balance to remove water from the body thus inhibiting the production of milk and reducing the edema of the milk-filled mammary gland. Substances of antiedemic properties include for example Horse-chestnut (*Aesculus hippocastanum* ) derived escin. It increases the sensitivity of, above others, calcium channels to ions, which causes augmentation of the tension of the blood vessels. This increase in the sensitivity to ions and other particles such as for example 5-HT results in an augmentation in the contractibility of venous vessels and in a reduction in the fluids filtering in the interstitial tissue. Apart from the effect of "sealing" small blood vessels, escin reduces the activation of vessel endothelial cells caused by a lack of oxygen. This activation initiates the cascade of inflammatory reactions, one of the elements of which is edema. Inhibition of the activation of vessel endothelial cells therefore has an anti-inflammatory and antiedemic effect (Sirtori, 2001). The latter is significant for pseudopregnant bitches, as it allows for the reduction of the edema of the mammary glands and the reduction of lactation. Also extract of Mouse-ear Hawkweed (Hieracium pilosella) has antiedemic properties.

Extracts of parsley, dandelion or *Phyllantus niruri* are known for their diuretic properties. Parsley has strong diuretic properties, because it reduces the activity of Na+/K+ATPase in the renal cortex and medulla. Such inhibition reduces the Na+ reabsorption to cells, limits the secretion of K+ and increases the concentration of K+ in the intracellular space and as a result impedes the passive flow of K+ through the tight junctions between cells. The inhibition of the activity of the Na+/K+ pump leads to a decrease in Na+ and K+ reabsorption and to osmotic inflow of water into the lumen of the renal tubules and as a result to diuresis (Kreydiyyeh and Usta, 2002). The diuretic properties of dandelion result from a high content of potassium and other minerals, whose secretion through the kidneys also boosts the ridding of water through the kidneys. In tests conducted on rats it was proved that the above-mentioned action is as powerful as classic diuretic medication, that is of furosemide, but it does not have its side effects, so excessive loss of potassium from the body (Rácz-Kotilla et al., 1974).

**CASE STUDY**

The assessment of the effectiveness of the ProlactiNO, VetExpert dietary supplement containing extracts of Vitex, dandelion and parsley, and Horse-chestnut derived escin on bitches presenting the symptoms of pseudopregnancy.

**Material:**

The preparation's effectiveness was assessed on a group of five female dogs with the symptoms of pseudopregnancy. The dogs' body weight did not exceed 10 kg. They also presented behavioural changes such as reluctance to leave the house, nesting and mothering to toys. The mammary glands were enlarged and contained lucid brown liquid or milk.

**Duration of observation:**

The bitches were given the preparation in the doses recommended by the producer for 14 days. No other drugs or supplements were administered to the animals. The product was well tolerated by the dogs and its administration did not cause any difficulties to the owners.

**The owners' assessment:**

The owners reported the effects of the preparation including a systematic reduction in the size of the mammary glands and the reduction of the quantity of milk secretion and a change in the dogs' behaviour. Even though the owners' assessment is subjective, it was so positive and the level of satisfaction with the product's efficiency was high enough to recommend its application in at least female dogs of small or medium-sized breeds.

**Conclusions**

According to the owners the product shows therapeutic effects in the treatment of pseudopregnancy. Other therapeutic indications for the use of this preparation except for pseudopregnancy include other situations when galactorrhea is unwanted. Such situations take place when the dog gives birth to a dead litter or following the surgeries of *ovariohysterectomy* or *ovariectomy* during the luteal phase.

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