

Canine Pseudopregnancy: A Review

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Abstract

Canine pseudopregnancy is a normal physiological syndrome that occurs in female dogs in their diestrial phase of estrous cycle. It simulates the peri and post-whelping signs that includes nesting, increase in weight and enlargement of mammary gland, lactation and mothering behavior on toys, shoes, puppies of other bitches. Decreased levels of progesterone, meanwhile raised levels of prolactin predispose the bitches to pseudopregnancy. It is a self-limiting clinical condition; however, anti-prolactin therapy indicated an overt pseudopregnancy. Predisposed bitches not used for breeding purpose. The permanent solution for prevention of this clinical condition is ovariectomy (OHE). In this article reviewed regarding aetiopathophysiology, clinical signs, diagnosis and treatment of pseudopregnancy.

Keyword: Canine, pseudopregnancy, syndrome

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INTRODUCTION

Pseudocyesis, pseudopregnancy, nervous lactation, copycat pregnancy, phantom pregnancy is a physiological syndrome simulate to those observed during the post-whelping period [1]. This condition varies from bitches. Voith, (1980) [2] and Jochle, (1997) [3] opined that non-mated female wolves had to lactate other female wolves litters. From that reports pseudopregnancy evolved through families. Prevalence reports about 50–75% was estimated [4]. Although it is stimulated by hormonal changes, exact causes for that condition not completely understood [5]. In this

article reviewed regarding aetiopathophysiology, clinical signs, diagnosis and treatment of pseudopregnancy.

Endocrine pattern of bitch estrous cycle: Canine has different reproductive pattern that are unique. The bitch once in 6 months approaches the estrous cycle because anestrus about 4 to 4.5 month [6]. The canine estrous cycle includes; pro-estrous, estrous, diestrous and anestrus. Report regarding length of the estrous cycle pattern was 5 to 12 month. Stages of cycle tabulated (Tab: 1).

Stage of cycle (Tab:1)	Predominant sign	Hormonal Changes	Reference
Pro-oestrus (3–20 days) (Average-9 days)	Swollen vulva. Sanguineous discharge at the vulvar lips. Not acceptance of male	Pre-ovulatory surge of LH. Oestrogen level rises. Progesterone appears on circulation. E ₂ concentration about 50–70 ng/ml	Concannon, 1986 [6] Bell Christie and Youngali, 1971 [7]
Estrus (3–20 days) (Average-9 days)	Acceptance of male Maximal receptive period.	Progesterone start rises on circulation. Ovulation occur 48hrs after LH surge. E ₂ levels slowly falls. Immature ovum released, that attain maturation in the tract within 2 days.	Root Kustritz, 2012 [8]
Diestrum Pregnant bitch-62 to 64 days. Non-pregnant- 60 to 80 days	Going out of heat signs Functional CL. Mammary development.	Progesterone level rises followed by decline in the end of diestrum (Less than 2 ng/ml). P ₄ production supported by LH and Prolactin hormone.	Root Kustritz, 2012 [8]
Anoestrus (4 to 4.5 months)	Outward signs are absent. Quiescent period of cycle.	Low serum Progesterone concentration. FSH levels relatively elevated. LH levels increase late in stage(Require estrogen priming)	Concannon, 1989 [9] Root Kustritz, 2012 [8]

Clinical signs: Both pregnant and non-pregnant bitches could have similar signs but intensity of signs varies from bitches. In diestrous bitches with non-pregnant have no signs are called covert pseudopregnancy (Covert PSC) while have observable signs are called overt pseudopregnancy (Overt PSC). Gobello et al. (2001) [9] reviewed different clinical signs observed in pseudo pregnant bitches (Tab: 2).

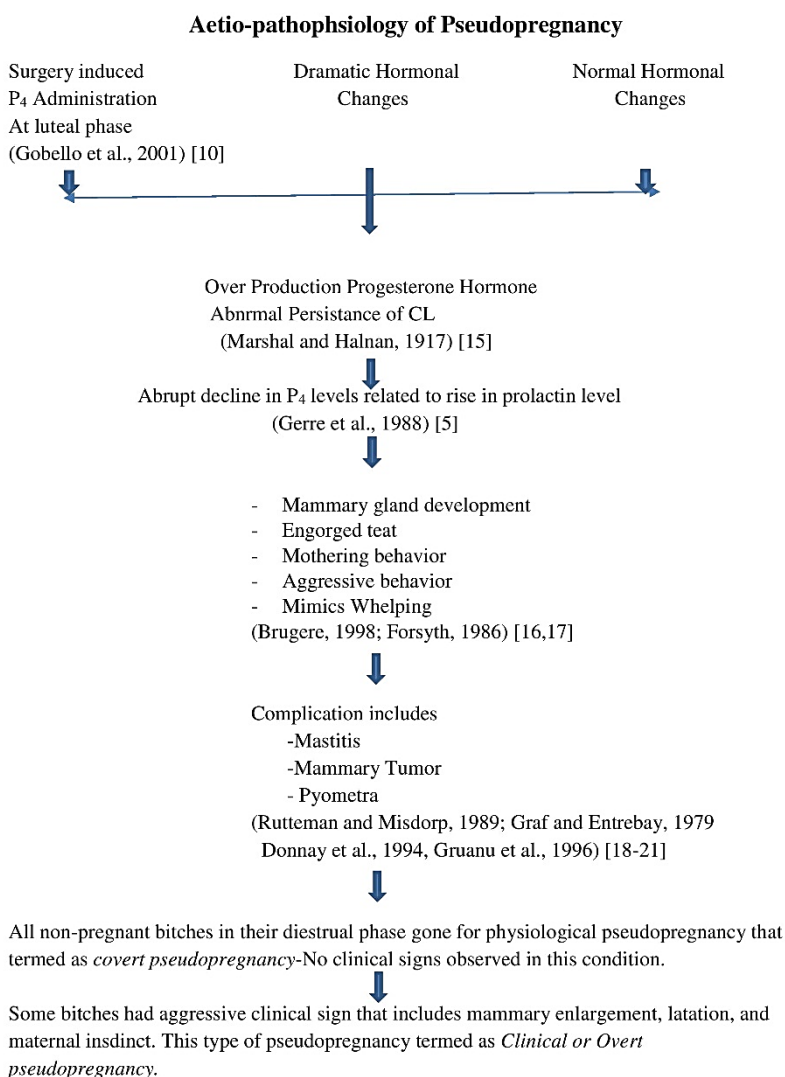
Late gestational behavior	Increase in weight, Enlargement of mammary gland, lactation, abdominal contraction, self-nursing.	Mialot et al. 1984 [11] Feldman and Nelson, 1996 [1] Johnston, 1980 [4]
Ancillary sign	Polyuria, Polyphagia, Diarrhea.	Romagnoli, 2009 [12]

Tab:2	Clinical signs	Reference
Behavioral changes	Restlessness, Licking of mammary gland, Anorexia, Decreased expression and activity Aggressiveness.	Gobello et al. 2001[9]
Maternal behavior	Nesting habit, Carrying the inanimate objects, Carrying other bitches puppies.	Romagnoli, 2009 [10]

Pseudopregnancy signs are observed in women. One comparative study reviewed differences regarding hyperprolactinaemia and serum prolactin concentration, but no difference existing [13, 14].

Aetio-Pathophysiology-Represented in the form of flow diagram (Flow Diagram: 1)

Flow Diagram of Aetio-pathophysiology of Pseudopregnancy (Flow Diagram.1)



Diagnosis: Diagnosis of pseudopregnancy should be required, because improper diagnosis and administration of prolactin antagonist compound results in abortion (or) pre-term whelping.

- (a) Based on the clinical signs observed.
 - (b) Abdominal palpation-foetal part palpable if pregnant.
 - (c) Ultrasonography-if early diestrual stage.
 - (d) Radiography-if late diestrual stage.
 - (e) Hormone estimation.
- (i) Relaxin hormone estimation - Klonisch et al. (1999) [22] opined that relaxin hormone not detectable in non-pregnant bitch and detectable in pregnant bitch (5 ng/ml).
 - (ii) Acute phase protein estimation. - Present in post implantation period and absent in pseudo pregnant bitch [23, 24].
 - (iii) Elevated level of estradiol 17 beta in pregnant luteal phase [25].
 - (iv) Thyrotrophic releasing hormone (TRH) - TRH stimulates the release of both

thyrotropin and prolactin [26] associated with primary hypothyroidism [27].

Treatment Approach

Mild cases of pseudopregnancy usually need no treatment. Overt cases require treatment. It is a self-limiting condition, so conventional method solves that problem.

(a) Conventional Approach:

Elizabethan collars, T-shirts are used to prevent licking (or) nursing of mammary gland is prescribed. Avoid application of cold (or) hot packing on glands. Should prevent the licking and milking. Based on the renal profile [1] advised to restrict the water up to 5–7 days in night hours. Non-phenothiazine compounds like Diazepam are indicated whereas phenothiazine compounds are contraindicated in pseudocycosis cases because it stimulates the prolactin release from the anterior pituitary [28].

(b) Medical Approach:

Category	Ingredient	Dose rate	Side effects	References
Sex steroids	<u>Estrogen compounds:</u> Diethyl stilbesterol, Estradiol benzoate, Estradiol cypionate.	-	Signs of estrus Uterine pathology Pyometra	Gobello et al. 2001 [9]
	<u>Androgen compounds:</u> Testosterone Mibolerone	36 µg/kg for 5 days	Virilizing effect	Gobello et al. 2001 [9] Janssens, 1986 [29]
	<u>Progestin compounds:</u> Melengesterol acetate (MGA) Medroxy progesterone acetate (MPA)	-	Recurrence of lactation. Cystic endometrial hyperplasia (CEH) Mammary tumor. Acromegaly.	Feldman and Nelson, 1996 [1]
Dopamine Agonist (Ergoid derivatives)	<i>Bromocriptine</i> (D2 receptor agonist) <i>Cabergoline</i> <i>Metergoline</i>	10–100 µg/kg/day for 10–14 days. 5 µg/day for 5–10 days. 0.2 mg/kg/day for 8–10days.	Vomition (prevent that ondansetron administered) Less side effects Whining effect.	Verstegen and Decoster, 1985 [30] Arbeiter et al. 1988 [31] Hamon et al. 1981 [32].

(c) Surgical Approach

Ovario-hysterectomy procedure needed when the bitches every cycle showing pseudopregnancy sign. Recurrence of pseudopregnancy predisposes the bitches to pyometra and mammary tumor. The permanent solution for prevention of this clinical condition is ovariohysterectomy (OHE). Important point to remember before going for surgery approach was bitches should be in anestrus. Surgical removal of uterus on diestrus stage further

aggravate the condition, because it further decline in Progesterone level followed by increases in prolactin level culminate double the level of syndrome/ condition occur.

CONCLUSION

Knowledge of the Underlying pseudopregnancy of the canine species permits veterinarian to make the possible advice to clients regarding clinical form of pseudopregnancy and their management.

Ultrasonography requires differentiation of pseudo pregnant from normal pregnant bitches. Pseudopregnancy can be aggravated by abrupt licking of mammary glands. So, prevention from licking of gland is important. Medical management requires in overt pseudo pregnant cases. The permanent solution for prevention of this clinical condition is ovariohysterectomy (OHE).

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