



Puerperal Septic Fever and Helminthosis in a 5-Year-Old German Shepherd Bitch

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SUMMARY

Puerperium is a period post-partum characterized by physiological changes whereby the upper and lower reproductive tracts of the female genital system progressively tries to histologically and endocrinologically return to its pre-gravid state and the period is accompanied by adequate uterine tone for lochia elimination and epithelial regeneration (Voorwald and Tiosso, 2015). Normally, during puerperium the bitch exhibit initially greenish discharge (due to marginal haematoma), then serosanguinous vaginal discharge for 1–6 weeks being the time considered, as the time of normal uterine involution (Feldman and Nelson, 1986). In the first three weeks brownish, non-odorous lochia will be discharged from the vulva, gradually decreasing in volume after the first week (Von Heimendahl *et al.*, 2009). In bitches, the normal uterine involution requires more and adequate time compared to other species due to its nature of the endothelial placentation and deep uterine wounds created at placentation sites after detachment (Al-Bassam *et al.*, 1981). The duration of the puerperium/periparturient period in the bitch has been defined to be 12 weeks (Al-Bassam *et al.*, 1981, Orfanou *et al.*, 2009) or 15 weeks (Yeager *et al.*, 1990). The Bitch, being a monoestrous, polytococcus, non-seasonal animal has a physiological anestrous stage that lasts between 15 to 30 weeks following either parturition (whelping) or diestrous which is characterized by normal quiescence of the gonads and the tubular reproductive tracts. The periparturient period that occurs during the anaestrous stage of the reproductive/oestrous cycle of the bitch is very delicate and animals are usually susceptible to varying pathological conditions owing to stress and increased demands from the environment and the newborns. For this reason, follow-up of uterine involution is essential to ensure future reproductive capacity/fertility, since failure to complete reproductive organs regression can lead to endometritis, metritis and placental retention (Hirt *et al.*, 2000; Magata *et al.*, 2013). Many assumptions were raised due to lots of biological activities such as nursing of the puppies, uterine involution, milk production and hormonal changes that take place during postpartum period. Thus, bitches are supposed to be more susceptible to pathologic conditions and therefore, it is important to monitor vital functions, appetite and behaviour of postpartum bitches on a daily basis to enable early detection of illness (Grundy and Davidson, 2004). Increase demand in lactation/milk production may predispose the bitch to hypocalcaemia (puerperal tetany) during

this period and also a few days post whelping the cervix is physiologically open, paving ways for ascending uterine infection by pyogenic microbes which may lead to septicemia. Thus, a good health surveillance by both the owners and veterinarians is of paramount significance.

Infestation of the gastro-intestinal tract and other organs of the animal body by both the adult and immature stages of endo-parasitic helminths is well documented in dogs, especially in newly whelped or neonates and it constitute one of the main causes of pathologies of the intestinal tract in dogs (Blagburn *et al.*, 1996). The life cycle of the many occurring canine helminth species usually involved a vertical transmission from the dam to her offspring. The route of vertical transmission can be: prenatal (e.g *Toxocara canis*), lactogenic (e.g *Ancylostoma caninum*, *Strongyloides stercoralis*) or via coprophagy (*Echinococcus multilocularis*, *Filaroides hirthei*, *Oslems osleri*). Hypobiosis or developmental arrest allows for certain and specific life-cycle stages of the helminthic parasites (mostly L3) to be temporary in-activated in the somatic tissues of the host until the condition for survival is conducive. Such occurs mostly during pregnancy or when the immunity of the host is severely compromised (Shoop, 1999). The L3 re-activates during gestation and is transmitted to the offspring or neonates via milk during puerperal period, the parasites then infest the intestinal tract of the neonates and cause pathologies such as protein loss, diarrhea, obstruction of lumen, iron-deficiency anaemia (especially hook worms) and mortality in unattended condition (Crompton, 1989).

CASE PRESENTATION

A 5-year-old German Shepherd bitch weighing 35 kg and her three (day-old) puppies were presented to the Small Animal Unit of the Ahmadu Bello University Veterinary Teaching Hospital, Zaria on 6th May, 2019 with the complaints of weakness and non-sucking puppies. The condition was noticed a day prior to presentation and the puppies were given an oral rehydration salt. The bitch had two successful whelpings and two abortions consecutively prior to this reported whelping. She was fed turn brown and she has a comprehensive vaccination and medical records. The clinical signs observed were: enlarged superficial lymph nodes (submandibular, pre scapular and popliteal), hyperpnoea, bilaterally congested ocular mucous membranes, dysgalactia, preventing puppies from suckling, epilation, rough hair coat, bloody vulva discharges with patent cervix, matted perineum with a reddish doughnut protruding mass on the dorsal commissure of the vulva and all the three vital parameters were above normal for first three days of presentation (Table I). Differential diagnoses of Brucellosis,

Helminthosis, Mastitis, Transmissible venereal tumor and Puerperal septic fever were made while Puerperal septic fever and Helminthosis were tentatively diagnosed for medical intervention.

Laboratory Investigations

Blood samples were sent to Clinical Pathology and Protozoology laboratories for haemogram and haemoparasite screening respectively, while faecal, vaginal swab and serum samples were sent to helminthology laboratory for helminth ova and oocyst screening, microbiology laboratory for culture and isolation and to public health laboratory for brucellosis screening accordingly.

Laboratory Results

Haematology laboratory revealed moderate anaemia, leukocytosis due to neutrophilia and eosinopenia (Table II). Parasitological evaluations indicated no evidence of haemoparasite but *Ancylostoma* egg+ was seen from the faecal sample, while microbiology laboratory was positive of *Staphylococcus* and *Proteus* spp and the serum sample was negative of brucellosis

using Rose Bengal Plate Test from public health laboratory.

Case Management

The management intervention was based on the tentative diagnosis by administering tablets of Praziquantel and Pyrantel pamoate at 5 mg/kg(175mg) and 10 mg/kg(350mg) orally, respectively, Injectable 5% Oxytetracycline at 5 mg/kg(175mg) was administered, intramuscularly, for five consecutive days b.i.d, diclofenac sodium at 2 mg/kg(70mg) I.M $x^{3/7}$ and metoclopramide 1mg/kg (35mg) I.M once.

DISCUSSION

Thermometry is one of the most important tools employed by veterinarians in assessing the health status of animals, because of it, being easy, safe and can be performed even by the owners. However, temperature measurement in puerperal bitches is a subject of controversy among clinicians and various authors (Schulze *et al.*, 2018). Some authors consider elevated temperatures in the first few days of puerperium to be physiologic (Veronosi *et al.*, 2002) as they may be caused by ascending uterine diseases occasioned by endogenous pyrogens in response to infection, inflammation, injury, or antigenic challenge in the uterus and vagina (Smulian *et al.*, 2003) or because of increased metabolism for lactation and tissue repair at placental sites. While other authors regard an elevation of body temperature over 39.5 °C to be an indication for a pathological process such as mastitis, metritis or hypocalcaemia (Johnson *et al.*, 2001). However, in this case, an elevated rectal temperature 41.3 °C (Table I) of the puerperal multiparous bitch was indicative of undergoing ascending uterine pathology as manifested by other clinical signs of congested ocular mucous membranes (bilateral), dysagalactia and reduced

appetite. The observation was similar to what Grundy and Davidson, (2004) suggested that any postpartum bitch which has clinical signs of lethargy, anorexia or vomiting and is febrile should immediately be examined by a veterinarian for postpartum septicemia. The condition responded positively well to the therapy of an antibiotic (5% Oxytetracycline I.M b.i.d $X^{3/7}$) and a non-steroidal anti-inflammatory (2mg/kg of Diclofenac Sodium I.M $X^{3/7}$) which further strengthens a positive diagnosis of puerperal septic fever. More so, the increased number of leucocytes (leukocytosis) due to neutrophilia and eosinophilia (Table II) is both suggestive of an ongoing concurrent septicemia and helminthic infestation in the postpartum bitch. The dewormers (Pyrantel pamoate [10mg/kg] and praziquantel [5mg/kg]) were used *per os* to treat for both nematodes and cestodes with flukes together in order to achieve broad spectrum activity. This is very essential so as take care of the helminth parasite in the dam (bitch) as well as to prevent vertical transmission (lactogenic) of the parasites to the suckling neonates. The eosinophilia (increase number of eosinophils) observed in this case (Table II) in addition to clinical manifestation of rough hair coats, epilation and/or emaciation maybe suggestively attributed to the migratory nature of some nematodes (e.g *Toxocara canis*) commonly seen in bitches of all breeds. There was a pyrantel induced vomiting on the second day of presentation, which was adequately managed by 1mg/kg of metoclopramide. Metoclopramide was chosen for its potent anti-emetic effect in addition to its lactogenic and galactopoietic properties to further increase both milk production and flow for the suckling neonates.

Table I: Showing the vital parameters of the Bitch for five (5) consecutive days

Parameters Days	Patient's Values					Reference Values	
	1	2	3	4	5		
Temperature (°C)	41.3	39.5	39.2	39.2	38.6	38.5 - 39.4	
Pulse Rate (beats/min)	96	102	90	91	90	65-90	
Respiratory Rate (cycles/min)		Rapid	Rapid	60	46	44	15-30

Table II: Showing the haemogram of the Bitch on the day of presentation.

Parameters	Patient's values	Reference values
HB(g/dl)	10.3	12.0-18.0
PCV (%)	31	37-55
WBC (10 ⁹ /L)	20.3	6-17
BANDS (10 ⁹ /L)	1.421	0.0-3.0
NEUTROPHILS (10 ⁹ /L)	17.458	3.0-11.5
LYMPHOCYTES (10 ⁹ /L)	1.015	1.0-4.8
MONOCYTE (10 ⁹ /L)	0.406	0.2-1.5
EOSINOPHILS (10 ⁹ /L)	0	0.1-1.25

CONCLUSION AND RECOMMENDATION

It was concluded that, bitches at post whelping (puerperal) periods that show hyperthermia and systemic signs of lethargy, inappetence, congestion of ocular mucous membranes should be considered diseased and thus, adequate and prompt veterinary care be given. Furthermore, puerperal period is very delicate and that concurrent infection (septicemia) and infestation (helminthosis) can occur and can be treated successfully with 5% Oxytetracycline and pyrantel permoate/paraziquantel respectively.

We recommended that gravid bitches should be brought to veterinary clinic promptly for adequate antenatal care and pregnancy evaluations. Also recommended was routine deworming in adult bitches in order to enhance well-being and prevent zoonosis.



Plate I: Showing a weak and recumbent puerperal bitch on examination table



Plate II: Examining the patency of the Cervix



Plate III: showing deep intra-cervical vaginal swab taken on the presented Bitch



Figure IV: showing sero-sanguinous (lochia) on the gloved index finger of the clinician after checking for cervical dilatation



Plate V: Showing the Bitch with her suckling neonates after successful intervention

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