

REMISSION OF CLINICAL SIGNS OF ADULT-ONSET GENERALIZED DEMODICOSIS AFTER TREATMENT FOR CONCURRENT BABESIOSIS AND/OR GRANULOCYTIC EHRlichIOSIS IN DOGS

TARELLO W.*

Sir,

Demodicosis is a severe parasitic cutaneous disease of dogs caused by the uncontrolled proliferation of demodectic mites belonging to the genus *Demodex* sp. (Acari: Prostigmata) (Craig, 2003). Concomitant factors potentially immuno-suppressive such as hypothyroidism (Saridomichelakis *et al.*, 1999), diabetes mellitus and chemotherapy (Duclos *et al.*, 1994) have been recorded. Therapeutic responses of systemic adult-onset

demodicosis to acaricide treatment alone (amitraz, ivermectin, milbemycin) may be incomplete or refractory (Medleau *et al.*, 1996; Fondati, 1996) unless underlying predisposing factors and concomitant immunosuppressive diseases have been identified and removed (Craig, 2003).

Presence of babesiosis and/or ehrlichiosis and response to specific therapies was retrospectively analyzed in 12 dogs diagnosed with adult-onset generalized demodicosis (Medleau *et al.*, 1996) resistant to standard treatments or relapsed after prior anti-parasitic therapies (Table I).

11 cases of babesiosis and eight cases of canine granulocytic ehrlichiosis (CGE) (Tarello, 2003b), were identified through microscopic examination of Wright-stained blood smears. Treatments included the administration of imidocarb dipropionate (Carbesia[®], Shering-Plough Animal Health, 1 ml/25 kg, once a week, for four weeks) in dogs diagnosed with babesiosis, and of doxycycline (Ronaxan[®], Merial, 10 mg/kg/day, 21-42 days) at anti-ehrlichial dosages in dogs diagnosed with CGE. Physi-

* DVM, MRCVS, Studio Veterinario Spina, C.P. 1644, 06129 Perugia, Italy. Tel.: 00 39 075 505 22 04. E-mail: wtarello@yahoo.it

Dog	Sex, age, breed	Previous treatments	Clinical symptoms & signs	Blood smear's results	Therapy outcomes*
1	M, 1.1/2 yr, Pointer Italy (1996)	Amitraz, Ivermectin (<i>no benefit</i>)	Whole body lesions, pododemodicosis; anorexia, lethargy conjunctivitis & fever	Babesiosis = + CGE = ++	Slow recovery <i>within 9 weeks</i>
2	F, 2 yrs, Pointer Italy (1997)	Amitraz (<i>no benefit</i>)	Whole body lesions, pododemodicosis lethargy & blepharitis (conjunctivitis)	Babesiosis = ++ CGE = ++	Slow recovery <i>within 8 weeks</i>
3	M, 2 yrs, Blood-hound Italy (1999)	Ivermectin (<i>no benefit</i>)	Multiple lesions (7) on head, neck and thorax, lymph-adenomegaly and fever	Babesiosis = +++	Fast recovery <i>within 3 weeks</i>
4	M, 1.1/4 yr, Am. Pitt Bull Saudi Arabia (2002)	Amitraz (<i>partial benefit followed by relapse</i>)	Multiple lesions (5) on neck, thorax and fore flimbs; conjunctivitis, poor appetite	Babesiosis = +	Fast recovery <i>within 4 weeks</i>
5	F, 1.1/2 yr, Ger. Shepherd Saudi Arabia (2002)	Fipronil, Amitraz, Ivermectin (<i>no benefit</i>)	Multiple lesions (11) on neck, thorax and limbs; fever and conjunctivitis	Babesiosis = ++ CGE = ++++	Fast recovery <i>within 7 weeks</i>
6	F, 1.3/4 yr, Golden retriever Saudi Arabia (2002)	Fipronil, Amitraz, Ivermectin	Multiple lesions on four limbs; lethargy and limping	Babesiosis = + CGE = ++++	Slow recovery <i>within 9 weeks</i>
7	F, 3 yrs, Belg. Shepherd Saudi Arabia (2002)	Amitraz	Multiple lesions (8) on thorax and legs; Conjunctivitis	Babesiosis = ++ CGE = ++	Fast recovery <i>within 4 weeks</i>
8	M, 4 yrs, Belg. Shepherd Saudi Arabia (2002)	Amitraz	Facial area and multiple fore-feet lesions; conjunctivitis, limping and fever	Babesiosis = + CGE = ++	Fast recovery <i>within 4 weeks</i>

Table I (to be continued).

Dog	Sex, age, breed	Previous treatments	Clinical symptoms & signs	Blood smear's results	Therapy outcomes*
9	M, 5 yrs, Germ. Shepherd Saudi Arabia (2002)	Ivermectin, Fipronil	Facial area and multiple fore-feet lesions; fever, vomiting, lethargy, conjunctivitis	Babesiosis = + CGE = ++	Fast recovery within 5 weeks
10	M, 3 yrs, Belg. Shepherd Saudi Arabia (2002)	Amitraz, Milbemycin	Pododemodiosis on 4 feet; fever and limping	CGE = +++	Slow recovery within 9 weeks
11	M, 1.3/4 yr, Am. Pitt Bull Kuwait (2003)	Ivermectin	Pododemodiosis on 4 feet; limping and bleeding from feet; lymph-adenomegaly	Babesiosis = ++	Fast recovery within 7 weeks
12	F, 1.1/2 yr, Pug-dog Thailand (2004)	Antibiotics, vitamins, Ivermectin (no benefit)	Multiple lesions (12) on whole body; pruritus, poor appetite, lethargy, limping	Babesiosis = ++	Fast recovery within 7 weeks

* Babesiosis was treated with imidocarb dipropionate (four injections, one week apart). CGE was treated with doxycycline (os., 21-42 days at 10 mg/kg/day).
 Infected red (babesiosis) and white (CGE) blood cells: (+): less than 0.03 %; (++) : from 0.03 to 0.3 %; (+++) : from 0.3 to 3 %; (++++): more than 3 %.

Table I. – Signalment, history, clinical findings and results of laboratory tests and therapies in 12 dogs with generalized demodicosis from Italy, Saudi Arabia, Kuwait and Thailand.

cal controls were performed weekly until clinical resolution. Each dog was submitted to a 6-month period of follow-up.

Cutaneous lesions due to *Demodex* infestation disappeared within three-nine weeks (Table I), together with general signs evocative of babesiosis and CGE, such as anorexia, lethargy, vomiting and fever (Tarello, 2003a, 2003b). No relapse was seen in dogs thus treated during a 6-month period of follow-up. Microscopic examination of skin scrapings was not performed after the end of therapy since dogs appeared clinically cured and also because *Demodex* mites are always present, to some extent, in the skin of normal dogs.

In blood smears of controls examined after therapy *Babesia* and granulocytic *Ehrlichia* agents resulted absent (in case n° 3, 4, 7, 8, 9, 11 and 12) or sharply (80 to 95 %) decreased (in case n° 1, 2, 5, 6 and 10). Tick-borne parasites such as *Babesia* (Purvis, 1977) and *Ehrlichia* spp. (Collett *et al.*, 1987) are claimed to be immunosuppressive agents. Therefore it should not be controversial to note that 12 canine cases diagnosed with concomitant babesiosis (n = 11) and granulocytic ehrlichiosis (n = 8) found complete clinical cure following specific therapies against these agents (Table I). It is acknowledged that in the course of conditioned illness the eradication of concurrent pathogens can help towards remission and prevents recurrences (Tarello, 2002). Infective agents such as leishmaniosis

are known to exacerbate canine demodicosis (Mozos *et al.*, 1999). Moreover, clinical cure of generalized demodicosis has been achieved in the past through the elimination of underlying factors (Hillier & Desh, 2002). General signs evocative of babesiosis and ehrlichiosis ceased concomitantly with the administration of their specific therapies and prior or simultaneously with the progressive disappearance of demodectic lesions. Babesiosis and granulocytic ehrlichiosis should be included in the differential diagnosis of factors influencing adult-onset generalized canine demodicosis and their eradication should be considered a pre-requisite for an effective treatment.

REFERENCES

- CRAIG M. Demodicosis, *in*: BSAVA Manual of small animal dermatology. Foster A.P. & Foil C.S. (eds). BSAVA, Gloucester, 2003, 153-158.
- COLLETT M.G., DOYLE A.S., REYNERNS F., KRUSE T. & FABIAN B. Fatal disseminated cryptococcosis and concurrent ehrlichiosis in a dog. *Journal of South African Veterinary Association*, 1987, 58, 197-202.
- DUCLOS D.D., JEFFERS J.G. & SHANLEY K.J. Prognosis for treatment of adult-onset demodicosis in dogs: 34 cases (1979-1990). *Journal of American Veterinary Medical Association*, 1994, 204, 616-619.

- FONDATI A. Efficacy of daily oral ivermectin in the treatment of 10 cases of generalized demodicosis in adult dogs. *Veterinary Dermatology*, 1996, 7, 99-104.
- HILLIER A. & DESH C.E. Large-bodied *Demodex* mite infestation in four dogs. *Journal of American Veterinary Medical Association* 2002, 220, 623-627.
- MEDLEAU L., RISTIC Z. & MCCELVEEN D.R. Daily ivermectin for treatment of generalized demodicosis in dogs. *Veterinary Dermatology*, 1996, 7, 209-212.
- MOZOS E., PEREZ J., DAY M.J., LUCENA R. & GINEL P.J. Leishmaniosis and generalized demodicosis in three dogs: a clinicopathological and immunohistochemical study. *Journal of Comparative Pathology* 1999, 120, 257-268.
- PURVIS A.C. Immunodepression in *Babesia microti* infections. *Parasitology*, 1977, 75, 197-205.
- SARIDOMICHELAKIS M., KOUTINAS A., PAPADOGIANNAKIS E., PAPA-ZACHARIADOU M., LIAPI M. & TRAKAS D. Adult-onset demodicosis in two dogs due to *Demodex canis* and a short-tailed demodectic mite. *Journal of Small Animal Practice*, 1999, 40, 529-532.
- TARELLO W. Cutaneous lesions in dogs with *Dirofilaria (Nochtiella) repens* infestation and concurrent tick-borne transmitted diseases. *Veterinary Dermatology*, 2002, 13, 267-274.
- TARELLO W. Concurrent cutaneous lesions in dogs with *Babesia gibsoni* infection in Italy. *Revue de Médecine Vétérinaire*, 2003a, 154, 281-287.
- TARELLO W. Canine granulocytic ehrlichiosis (CGE) in Italy. *Acta Veterinaria Hungarica*, 2003b, 51, 73-90.

Reçu le 15 juin 2007

Accepté le 20 septembre 2007

Erratum

ROY L. & CHAUVE C.M. Historical review of the genus *Dermanyssus* Dugès, 1834 (Acari: Mesostigmata: Dermanyssidae). *Parasite*, 2007, 14 (2), 87-100.

The authors wish to correct an error in the published manuscript. On page 97, column 2, line 16, a confusion between two species names (*D. passerinus* and *D. hirundinis*) has been found. The sentence should read: "Moreover, according to Moss, it is most likely that *D. longipes* and *D. hirundinis* are conspecific". Authors apologize to readers for this mistake.