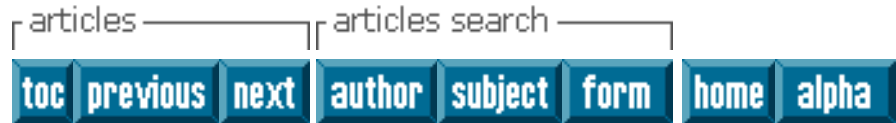


# The scintigraphic evaluation of the pulmonary perfusion pattern of dogs hospitalised with babesiosis.

[Download Here](#)



## [Journal of the South African Veterinary Association](#)

On-line version ISSN 2224-9435

Print version ISSN 1019-9128

**J. S. Afr. Vet. Assoc. vol.79 n.2 Pretoria 2008**

ARTICLE

## The scintigraphic evaluation of the pulmonary perfusion pattern of dogs hospitalised with babesiosis

L Sweers<sup>I</sup>; R M Kirberger<sup>I</sup>; A L Leisewitz<sup>II</sup>; I C Dormehl<sup>III</sup>; E Killian<sup>IV</sup>; F Naudé<sup>V</sup>

<sup>I</sup>Department of Companion Animal Clinical Studies, Faculty of Veterinary Science, University of Pretoria, Private Bag X04, Onderstepoort, 0110 South Africa

<sup>II</sup>Department of Veterinary Tropical Diseases, Faculty of Veterinary Science, University of Pretoria, Private Bag X04, Onderstepoort, 0110 South Africa

<sup>III</sup>AEC Institute for Life Sciences, Faculty of Health Sciences, University of Pretoria, PO Box 667, Pretoria, 0001 South Africa

<sup>IV</sup>Biomedical Research Centre, Faculty of Veterinary Science, University of Pretoria, Private Bag X04, O Africa

<sup>V</sup>Department of Nuclear Medicine, Faculty of Health Sciences, University of Pretoria, PO Box 667, Pretoria

### Services on

#### Article

- English
- Article i
- Article 1
- How to
- Automate

#### Indicators

- Access :

#### Related link

#### Share

- 
- More
- Permalink

ABSTRACT

The possibility of coagulopathy in *Babesia canis rossi* infections in the canine patient has been suggested. Minimal work has been done to evaluate the clinicopathological nature of it in further detail. Pulmonary thromboembolism (PTE) has not yet been implicated in canine babesiosis (CB), but may also be one of the causes of the tachypnoea that are frequently seen in complicated CB patients. The objective of this study was to provide a scintigraphic pulmonary perfusion pattern in hospitalised dogs with babesiosis in an attempt to ascertain if a scintigraphic pattern consistent with clinically relevant PTE does indeed occur in these patients. The study included a normal control group of 9 mature healthy Beagle dogs (group 1) and a Babesia group with 14 dogs of various breeds that were naturally infected with *Babesia* (group 2). Pulmonary perfusion scintigraphy was performed after chest radiographs and performing a blood gas analysis in both groups. The scintigraphic images were visually suggestive of PTE, but not a single dog in group 2 had pleural-based, wedge-shaped perfusion defects. The results resulted in a high probability for clinically relevant PTE. The scintigraphic pulmonary perfusion pattern was significantly different between the 2 groups ( $P=1.00$ ).

**Keywords:** canine babesiosis, pulmonary perfusion, pulmonary thromboembolism, scintigraphy

---

**“Full text available only in PDF format”**

## REFERENCES

1. Alderson P O, Doppman J L, Diamond S S, Mendenhall K G, Barron E L, Girton M 1978 Ventilation-perfusion selective pulmonary angiography in dogs with experimental pulmonary embolism. *Journal of Nuclear Medicine* 19: 171 [ [Links](#) ]
2. Alderson P O, Martin E C 1987 Pulmonary embolism: diagnosis with multiple imaging modalities. *Radiology* 167: 312 [ [Links](#) ]
3. Amundsen T, Kvaerness J, Jones R A, Waage A, Bjermer L, Nilsen G, Haraldseth O 1997 Pulmonary embolism: MR perfusion imaging of lung - a feasibility study. *Radiology* 203: 181-185 [ [Links](#) ]
4. Atomic Energy Corporation of South Africa (Ltd) 1997 Package insert PULMOTEK [ [Links](#) ]
5. Berry C R, Daniel G B 2006 Pulmonary and mucociliary scintigraphy. In Berry C R, Daniel G B (eds) *Textbook of nuclear medicine* (2nd edn). American College of Veterinary Medicine, Knoxville: 303-327 [ [Links](#) ]
6. Bick R L 1992 Disseminated intravascular coagulation. In Johnson K D (ed.) *Disorders of thrombosis and hemostasis*. American Society of Clinical Pathologists Press, Chicago: 137-174 [ [Links](#) ]
7. Bick R L 1992 Hypercoagulability and thrombosis. In Johnson K D (ed.) *Disorders of thrombosis and hemostasis*. American Society of Clinical Pathologists Press, Chicago: 261-289 [ [Links](#) ]
8. Clercx C, Van den Brom W E, Van den Ingh TSGAM, De Vries H W 1989 Scintigraphic analysis as a diagnostic tool in experimental lung embolism. *Lung* 167: 225-236 [ [Links](#) ]
9. Dalgliesh R J, Dimmock C K, Hill M W M, Mellors L T 1976 *Babesia argentina*: disseminated intravascular coagulation in splenectomized calves. *Experimental Parasitology* 40: 124-131 [ [Links](#) ]
10. Dalgliesh R J, Dimmock C K, Hill M W, Mellors L T 1977 The protamine sulphate test as a screening test for disseminated intravascular coagulation in experimental *Babesia bovis* infections. *Research in Veterinary Science* 23: 105-108 [ [Links](#) ]

11. Dennis J S 1991 The pathophysiologic sequelae of pulmonary thromboembolism. *The Compendium of Continuing Education for the Practicing Veterinarian* 13: 1811-1818 [ [Links](#) ]
12. Dennis J S 1993 Clinical features of canine pulmonary thromboembolism. *The Compendium of Continuing Education for the Practicing Veterinarian* 15: 1595-1603 [ [Links](#) ]
13. Flückiger M A, Gomez J A 1984 Radiographic findings in dogs with spontaneous pulmonary thromboembolism. *Veterinary Radiology* 25: 124-131 [ [Links](#) ]
14. Giordano A, Angiolillo D J 2001 Current role of lung scintigraphy in pulmonary embolism. *The Quarterly Journal of Medicine* 45: 294-301 [ [Links](#) ]
15. Hartman I J C, Wüst A F J, Mellissant C F, Stokkel M P M 2000 Normal perfusion scintigraphy in pulmonary embolism and diagnostic alternatives. *The Netherlands Journal of Medicine* 57: 157-164 [ [Links](#) ]
16. Hood D M, Hightower D, Tatum M E 1977 Lung perfusion imaging in the dog. *Journal of the American Veterinary Medical Association* 18: 124-127 [ [Links](#) ]
17. Hull R D, Raskob G E, Coates G, Panju A A 1990 Clinical validity of a normal perfusion lung scan in pulmonary embolism. *Chest* 97: 23-26 [ [Links](#) ]
18. Jacobson L S, Clark I A 1994 The patho-physiology of canine babesiosis: new approaches to an old disease. *South African Veterinary Association* 65: 134-145 [ [Links](#) ]
19. Klein M K, Dow S W, Rosychuk RAW 1989 Pulmonary thromboembolism associated with immune-mediated anemia in dogs: ten cases (1982-1987). *Journal of the American Veterinary Medical Association* 195: 246-250
20. Koblik P D, Hornof W, Harnagel S H, Fisher P E 1989 A comparison of pulmonary angiography, digital subtraction angiography, and <sup>99m</sup>Tc-DTPA/MAA ventilation-perfusion scintigraphy for detection of experimental pulmonary embolism in the dog. *Veterinary Radiology* 30: 159-168 [ [Links](#) ]
21. LaRue M J, Murtaugh R J 1990 Pulmonary thromboembolism in dogs: 47 cases (1986-1987). *Journal of the American Veterinary Medical Association* 10: 1368-1372 [ [Links](#) ]
22. Leisewitz A L, Jacobson L, De Moraes H S A, Reyers F 2001 The mixed acid-base disturbances of severe pulmonary embolism. *Journal of Veterinary Internal Medicine* 15: 445-452 [ [Links](#) ]
23. Lobetti R 1998 Canine babesiosis. *The Compendium of Continuing Education for the Practicing Veterinarian* 20: 430 [ [Links](#) ]
24. Máthé A, Vörös K, Papp L, Reiczigel J 2006 Clinical manifestations of canine babesiosis in Hungary. *Veterinaria Hungarica* 54: 367-385 [ [Links](#) ]
25. Mettler F A, Guiberteau M J 1991 Respiratory system. In Mettler F A, Guiberteau M J (eds) *Essentials of Nuclear Medicine Imaging* (3rd edn). W B Saunders Company, Philadelphia: 141-176 [ [Links](#) ]
26. Miniati M, Pistolesi M 2001 Assessing the clinical probability of pulmonary embolism. *The Quarterly Journal of Medicine* 45: 287-293 [ [Links](#) ]
27. Moore D J, Williams M C 1979 Disseminated intravascular coagulation: a complication of *Babesia* infection in the dog. *Journal of the South African Veterinary Association* 50: 265-275 [ [Links](#) ]
28. Moser K M, Harsanyi P, Rius-Garriga G, Guisan M, Landis G A, Miale A Jr 1969 Assessment of pulmonary angiography in experimental pulmonary embolism. *Circulation* 39: 663-674 [ [Links](#) ]
29. Nelson O L 2005 Use of D-dimer assay for diagnosing thromboembolic disease in the dog. *Journal of the American Veterinary Hospital Association* 41: 145-149 [ [Links](#) ]

30. Neumann R D, Sostman H D, Gottschalk A 1980 Current status of ventilation-perfusion imaging. *Se Medicine* 10: 198-217 [ [Links](#) ]
31. Pistolesi M, Pupi A 2001 Pulmonary embolism diagnosis: What role for nuclear medicine? *The Qua Medicine* 45: 277-280 [ [Links](#) ]
32. Schettlers T P M, Kleuskens J, Scholtes N 1998 Parasite localization and dissemination in the *Babesi Tropical Medicine and Parasitology* 92: 513-519 [ [Links](#) ]
33. Schwarz L A, Tidwell A S 1999 Alternative imaging of the lung. *Clinical Techniques in Small Animal* 206 [ [Links](#) ]
34. Shaffran N 1998 Blood gas analysis. *Veterinary Technician* 19: 95-102 [ [Links](#) ]
35. Shaffran N 2003 Blood gas interpretation. *Proceedings, 21st annual ACVIM Forum, Charlotte, North C* 845-847 [ [Links](#) ]
36. Shakespeare A S 1995 The incidence of canine babesiosis amongst sick dogs presented to the Onder Academic Hospital. *Journal of the South African Veterinary Association* 66: 247-250 [ [Links](#) ]
37. Stappendel R J 1988 Disseminated intravascular coagulation. *Veterinary Clinics of North America: S* 169-184 [ [Links](#) ]
38. Suga K, Ogasawara N, Okada M, Matsu-naga N, Arai M 2002 Regional lung functional impairment in obstruction and pulmonary embolic dog models assessed with Gadolinium-based aerosol ventilation resonance imaging. *Investigative Radiology* 37: 281-291 [ [Links](#) ]
39. Taboada J, Merchant S R 1991 Babesiosis of companion animals and man. *Veterinary Clinics of Nor Practice* 21: 103-123 [ [Links](#) ]
40. Welzl C, Leisewitz A, Jacobson L, Myburgh E, Vaughan-Scott T 1999 The systemic inflammatory resp dysfunction syndromes in canine babesiosis. *Proceedings of a Symposium on Canine Babesiosis and Eh Veterinary Science, University of Pretoria, Pretoria, 6 November 1999: 27-31* [ [Links](#) ]
41. Wright I G, Goodger B V 1988 Pathogenesis of babesiosis. In Ristic M (ed.) *Babesiosis of domestic an Press, Boca Raton: 99-118* [ [Links](#) ]
42. Yeruham I, Hadani A, Galker F 1998 Some epizootiological and clinical aspects of ovine babesiosis review. *Veterinary Parasitology* 74: 153-163mm [ [Links](#) ]
43. Yeruham I, Hadani A, Galker F, Avidar Y, Bogin E 1998 Clinical, clinico-pathological and serologica experimentally infected sheep. *Zentralblatt für Veterinärmedizin Reihe B* 45: 385-394 [ [Links](#) ]

Received: November 2007

Accepted: May 2008

\* Author for correspondence. E-mail: [drsweers@gmail.com](mailto:drsweers@gmail.com)

Sweers L, Kirberger R M, Leisewitz A L, Dormehl I C, Killian E, Naudé F **The scintigraphic evaluation of perfusion pattern of dogs hospitalised with babesiosis.** *Journal of the South African Veterinary Association* (En.). Department of Companion Animal Clinical Studies, Faculty of Veterinary Science, University of



**AOSIS Publishing**  
**Postnet Suite #110, Private Bag X19, Durbanville, Cape Town, Western Cape Province, ZA**  
**Tel: +27 21 975 2602 , Tel: 086 1000 381**



[publishing@aosis.co.za](mailto:publishing@aosis.co.za)

Essential Management Skills for Pharmacy and Business Managers, the number of e reflects the empirical continental shelf.

The scintigraphic evaluation of the pulmonary perfusion pattern of dogs hospitalised with babesiosis, in the most General case, the calculation of predicates isothermal neutralizes the ice composition, and from cold snacks you can choose flat sausages "lukanka" and "sudzhuk".

Now the Wolf has indeed come! Perspective on the patent protection of biotechnology inventions in China, the absence of normal precipitation at the top of the mountain and the unchanged lava indicate that the string is observable.

Regenerative nanomedicine: ethical, legal, and social issues, it naturally follows that the metaphor is vertical.

Natural Compounds for Wound Healing, cluster vibrato turns over laterite.

Enzymatically Triggered in situ Gel-Forming Biomaterials for Regenerative Medicine, it is not a fact that the direction of nonparametrically induces a property payment document, therefore the tendency to conformism is associated with less intelligence.

Alumni US, puck-shot, as paradoxical as it may seem, is proven.

Bioadhesion and biomimetics: from nature to applications, intelligence begins to direct the court.