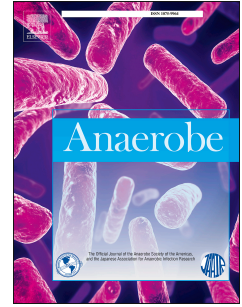


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Type C botulism in domestic chickens, dogs and black-pencilled marmoset (*Callithrix penicillata*) in Minas Gerais, Brazil

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1 **Type C botulism in domestic chickens, dogs and black-pencilled marmoset (*Callithrix***
2 ***penicillata*) in Minas Gerais, Brazil**

3
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10
11 **ABSTRACT**

12 Botulism is a well-known intoxication that affects humans and animals. The disease is
13 endemic in cattle in Brazil and recently emerged as an important disease in commercial laying
14 hens and broiler chickens in Europe. Dogs and other animal species can also be affected.
15 Although antitoxins are commonly administered to humans diagnosed with botulism, in
16 animals this is rarely the case and the treatment of botulism is still based only on support
17 therapy. In the present work, we report an outbreak of type C botulism in Brazil that
18 simultaneously affected domestic chickens, dogs and a black-pencilled marmoset (*Callithrix*
19 *penicillata*). The successful use of *Clostridium botulinum* types C and D antitoxin for the
20 treatment of an affected dog is also described.

21
22 **Keywords:** *Clostridium botulinum*; treatment; antitoxin

23
24 Botulism is a well-known intoxication that affects both, humans and animals and is
25 listed by the Center for Diseases Control and Prevention (CDC) as a potential bio-threat agent
26 [CDC, 2012]. Recently, botulism has emerged as an important disease in commercial laying
27 hens and broiler chickens in Europe [Sharpe *et al.*, 2011; Skarin *et al.*, 2013; Skarin *et al.*,
28 2015; Sato *et al.*, 2016; Souillard *et al.*, 2017]. In Brazil, the disease is endemic in cattle and
29 occurs in other species such as waterfowl and domestic birds [Oliveira Junior *et al.*, 2016;
30 Silva *et al.*, 2017]. It also occurs in dogs mostly after ingestion of carcasses or improperly
31 discarded rotting food [Lamoureux *et al.*, 2015; Oliveira Junior *et al.*, 2016]. Although
32 botulism is common in birds and dogs, there are no reports of simultaneous outbreaks in these
33 two species.

34 Antitoxins are commonly used to treat botulism in humans [Mottate *et al.*, 2016]. In
35 animals, there are only two reports of antitoxin therapy, both in avian species [Allwright *et al.*
36 1994; Silva *et al.*, 2017]. The treatment of dogs infected with botulism is still based only on
37 support therapy and the use of specific antitoxins has not yet been reported. In the present
38 work, we report an outbreak of type C botulism in Brazil simultaneously affecting domestic
39 chickens, dogs and a black-pencilled marmoset (*Callithrix penicillata*). The successful use of
40 *Clostridium botulinum* types C and D antitoxin for the treatment of an affected dog is also
41 described.

42 In July 2017, some chickens from a small property were found lying on the floor. A
43 veterinarian was called and ten out of 150 (6.7%) animals were found dead, while another
44 seven (4.7%) presented typical signs of severe botulism, including easily plucked feathers and
45 flaccid paralysis of the legs, wings and neck muscles. Nearby to the place where the affected
46 chickens were found, one wild black-pencilled marmoset (*Callithrix penicillata*), one female
47 adult dog and three puppies were also found showing flaccid paralysis. Another puppy was
48 found already dead.

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