

Short communication

SELENIUM TOXICITY IN DROMEDARY CAMELS CAUSES ABORTIONS

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ABSTRACT

Two of six dromedary camels aborted due to high selenium values found in their blood. Selenium toxicity has not been reported in camels, including abortions. Both aborted dromedary dams had serum selenium values of 6 $\mu\text{mol/L}$. Normal serum selenium values are 1.5 to 2.6 $\mu\text{mol/L}$. Evidence for an infectious cause of the abortion was not identified in these camels.

Key words: Abortions, dromedary camels, selenium toxicity

All animals are susceptible to selenium toxicosis, but it is more common in cattle, sheep, horses, and other herbivorous animals. Selenium toxicity has never been reported in camels under natural conditions. However, selenium deficiency in camels has been described by many researchers, and the clinical signs, primarily in young camels, are known as white muscle disease (WMD) (Abdelrahman *et al*, 2022). The etiology of selenium poisoning in ruminants is the ingestion of or injection with excessive amounts of selenium. Outbreaks in ruminants occur where soils and pastures contain toxic concentrations of selenium or following errors in feed supplementation, oral administration, or injectable dosing. Clinical signs include dyspnoea, diarrhoea, prostration, and eventually death (Radostits *et al*, 2007). Considerable variability in blood selenium concentrations has been reported for several reasons, including breed, age, sex, feeding practices, environmental and management conditions, as well as differences in analytical methodology. In addition, results are often reported in different units, such as ppm (liver), ng/mL, and $\mu\text{mol/L}$, making comparisons between studies difficult. At CVRL, selenium concentrations in animal serum are measured by graphite furnace atomic absorption spectrophotometry (GFAAS; Thermo Scientific, UK). The analytical method was described by Wernery *et al* (2009). In that study, selenium concentrations were measured in serum samples from 15,000 dromedary racing camels aged 2-8 years between 2004 and 2009. The mean selenium concentration was 1.91 ± 0.61

$\mu\text{mol/L}$ (reference range: 1.5-2.6 $\mu\text{mol/L}$) (Wernery *et al*, 2009). Abdelrahman *et al* (2022) reported a normal plasma selenium concentration of 100 ng/mL in camels, which corresponds to 1.26 $\mu\text{mol/L}$. This value is comparable to that reported by Wernery *et al* (2009).

EDTA blood and serum samples from six dromedary camels were submitted to CVRL for disease investigation after two of the animals had aborted. The results of this investigation are presented here.

Materials and Methods

To investigate the cause of abortions in two dromedary camels from a breeding herd in one of the Northern Emirates, EDTA blood and serum samples from six camels were submitted to CVRL. The samples were tested for antibodies against *Brucella* spp. and *Trypanosoma evansi* using routine serological methods. In addition, Giemsa-stained blood smears prepared from EDTA blood were examined for blood parasites. Serum samples were analysed for copper and selenium concentrations. Copper was measured by flame atomic absorption spectrophotometry (FAAS; Thermo Scientific, UK), and selenium by graphite furnace atomic absorption spectrophotometry (GFAAS). Haematological and biochemical analyses were performed according to the method described by Wernery *et al* (1999).

Results

No antibodies against *Trypanosoma evansi* or *Brucella* spp. were detected in any of the six serum

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samples. Haematological values for all six camels were within the reference range, and no blood parasites were detected in the Giemsa-stained blood smears. However, the muscle enzyme creatine kinase (CK) was mildly elevated at 183 U/L (reference range: up to 120 U/L). The serum copper and selenium concentrations are summarised in Table 1.

Table 1. Serum copper and selenium concentrations in six dromedary camels.

Test	Cu	Se
Unit	μmol/l	μmol/l
Reference Range	9.000 – 14.000	1.500 – 2.600
Method detection limit	0.47	0.2
Animal Name		
1. Pregnant 1	8.100	2.700
2. Pregnant 2	9.800	4.200
3. Pregnant 3	11.100	4.000
4. Aborted camel 4	11.300	6.000
5. Aborted camel 5	14.600	6.000
6. Pregnant 6	13.200	4.000

As shown in Table 1, serum copper concentrations were within the reference range, whereas selenium concentrations were elevated.

Discussion

Our investigations demonstrated elevated serum selenium concentrations in pregnant dromedary camels, while other potential causes of abortion, including trypanosomosis and brucellosis, were excluded by negative laboratory findings. Despite extensive investigations, the source of selenium intoxication could not be identified. Common causes of selenium overdose include excessive supplementation in feed rations, accidental overdosing due to miscalculation of

highly concentrated injectable selenium preparations, grazing on selenium-rich soils, or ingestion of selenium-accumulating plants such as *Astragalus* species. The latter can be excluded as a cause of selenium intoxication in the UAE.

Selenium toxicosis has been reported to cause abortions, stillbirths, and weak calf syndrome in cattle (Yaeger *et al*, 1998), but, to our knowledge, it has never been reported in camels.

Two of the six pregnant dromedary camels aborted and had serum selenium concentrations of 6.0 μmol/L, the highest values recorded among the six camels examined. No evidence of an infectious cause was identified in any of the animals. These findings suggest that excessive selenium exposure may have contributed to the abortions, although a definitive causal relationship could not be established.

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