

Short Communication

DATA OF ATOMIC ABSORPTION ANALYSIS OF COPPER, IRON AND COBALT IN BLOOD SERUM OF CALVES UNDER THE INFLUENCE OF SOME PHARMACOLOGICAL SUBSTANCES

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Abstract. The aim of the present work was to study the effect of hexamethylenetetramine, aminazine and analgin preparations, relatively widely used in veterinary practice, on the content of iron, copper and cobalt in blood serum in calves. Under observations were 9 bulls of Shvitz breed (6 experimental, 3 control) of 7-8 months of age, on which 3 series of experiments were carried out. Preparations were applied by intramuscular injections, once in doses (mg/kg body weight): hexamethylenetetramine - 12,5 and 50; aminazine - I and 5; analgin - 7,5 and 25. Calves in the control group were administered according to the same method 10 ml of distilled water per animal. The content of trace elements iron, copper and cobalt in blood serum of calves was investigated by atomic absorption spectrophotometry (analyser of 'Hitachi' company, model 208) before and 1-3 and 6 hours after administration of preparations.

Keywords: Trace elements, iron, copper, cobalt, hexamethylenetetramine, aminazine.

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1. Introduction

The results of studies show that in control animals, compared with the initial values, the iron content in blood serum mainly increased, while the level of copper and cobalt decreased (Azimov, 2004; Arbuzov, 2003).

Under the influence of hexamethylenetetramine in the first 3 hours after administration there was an increase in iron level by 61.4-41.8% from small and 139-100% from large doses of the drug with a subsequent decrease by 4-7% from the initial data by 6 hours from the beginning of observations. The results of studies show that in control animals, compared with the initial values, the iron content in blood serum mainly increased, while the level of copper and cobalt decreased (Azimov, 2004; Arbuzov, 2003).

Aminazine one hour after administration decreased serum iron levels in calves by 25.3-50.4% compared to the initial data, and then the indicators increased sharply and more markedly from low doses (by 224.2%) (Berzin, 1992).

Analgin in low doses decreased serum iron levels by 33.8-16.3% and in high doses - increased in the first 3 hours by 29.8-19.4% with a return to the initial norm in 6 hours from the beginning of the drug administration.

Copper content in blood serum hexamethylenetetramine in small doses, after a

short-term decrease (by 34.5%), increased by 27.5-3.4% and in large doses the pre-drug had a regular depressing effect.

Under the influence of aminazine and analgin in small doses the decrease of copper level was established and after the introduction of preparations in large doses the increase of this index by 3,4-41,3% and 32-16% accordingly was noted.

The level of cobalt in blood serum hexamethylenetetramine both in small and in large doses increased in 1,5-4 times. And after introduction of aminazine and analgin the decrease of the given indicator within 57-71,2 % from initial norm was established. More clearly the results of the effect of some drugs on the content of trace elements in blood serum of calves are shown in the Table 1 and hexogram.

Table 1. Effect of preparations on the content of trace elements in blood serum of calves

Drug (dose)	Iron	Copper	Cobalt
Hexamethylenetetramine 12.5 mg/kg (low dose)	↑ by 41.8–61.4% (1–3 h), then ↓ by 4–7% (6 h)	Short-term ↓ by 34.5%, then ↑ by 3.4–27.5%	↑ 1.5–4 times
Hexamethylenetetramine 50 mg/kg (high dose)	↑ by 100–139% (1–3 h), then ↓ by 4–7% (6 h)	Persistent ↓	↑ 1.5–4 times
Aminazine 1 mg/kg (low dose)	↓ by 25.3–50.4% (1 h), then ↑ up to 224.2%	↓ in copper level	↓ by 57–71.2%
Aminazine 5 mg/kg (high dose)	↓ by 25.3–50.4% (1 h), then ↑	↑ by 3.4–41.3%	↓ by 57–71.2%
Analgin 7.5 mg/kg (low dose)	↓ by 16.3–33.8%, return to normal (6 h)	↓ in copper level	↓ by 57–71.2%
Analgin 25 mg/kg (high dose)	↑ by 19.4–29.8% (1–3 h), return to normal (6 h)	↑ by 16–32%	↓ by 57–71.2%
Control (water)	Moderate increase	Decrease	Decrease
Drug (dose)	Iron	Copper	Cobalt
Hexamethylenetetramine 12.5 mg/kg (low dose)	↑ by 41.8–61.4% (1–3 h), then ↓ by 4–7% (6 h)	Short-term ↓ by 34.5%, then ↑ by 3.4–27.5%	↑ 1.5–4 times
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Aminazine 1 mg/kg (low dose)	↓ by 25.3–50.4% (1 h), then ↑ up to 224.2%	↓ in copper level	↓ by 57–71.2%
Aminazine 5 mg/kg (high dose)	↓ by 25.3–50.4% (1 h), then ↑	↑ by 3.4–41.3%	↓ by 57–71.2%
Analgin 7.5 mg/kg (low dose)	↓ by 16.3–33.8%, return to normal (6 h)	↓ in copper level	↓ by 57–71.2%
Analgin 25 mg/kg (high dose)	↑ by 19.4–29.8% (1–3 h), return to normal (6 h)	↑ by 16–32%	↓ by 57–71.2%
Control (water)	Moderate increase	Decrease	Decrease

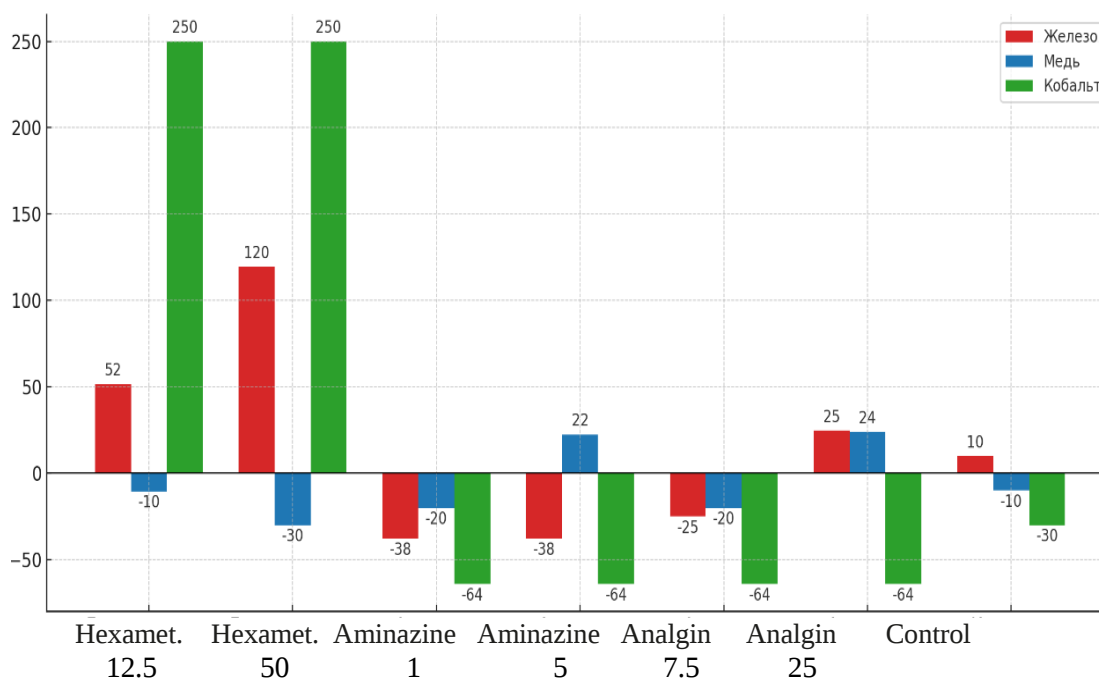


Diagram 1. Effect of preparations on the content of trace elements in blood serum of calves

2. Conclusion

As a result, the following conclusions can be drawn:

- Hexamethylenetetramine causes an increase in the level of iron and cobalt in blood serum in calves;
- Aminazine increases the content of iron in blood serum in small and copper - in high doses;
- Under the influence of analgin in maximum doses increase of iron and copper levels in blood serum.

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