ECG ALTERATIONS AND CHANGES IN BIOCHEMICAL PARAMETERS ASSOCIATED WITH EXPERIMENTAL SALINOMYCIN TOXICOSIS IN SHEEP

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Introduction: Salinomycin is a monocarboxylic polyether ionophore with antimicrobial properties. Clinical signs of ionophore intoxication are non specific and similar in all species and include tachycardia, muscle tremor, restlessness, loss of appetite, incoordination, muscular weakness and continual panting.

Objective: The present study was conducted to determine the ECG parameters and the types of arrhythmias and biochemical parameters changes in experimental salinomycin toxicosis in sheep.

Materials and methods: Acute toxicity with the ionophore (0.5 mg/kg; intravenously) was induced in 6 mixed breed female sheep (BW = 33.1 ± 3.4 kg). Six animals (control group) each received 10 ml saline solution intravenously. Blood samples were collected before and at various time intervals after the administration of salinomycin and their biochemical parameters (creatinine, calcium, phosphorus, sodium, potassium, chloride, and total protein) were determined using conventional laboratory methods. In both group the hearts of sheep were carefully heard and the electrocardiogram (ECG) was recorded to determine the types of arrhythmias. The ECGs of normal and intoxicated sheep were used for measuring heart rate, amplitude, duration, configuration, segments (PR and ST) and intervals (PP, RR, PR and QT). For measuring the wave’s amplitudes, segments and intervals, the computerized AutoCAD program was used.

Results and discussion: Concentrations of creatinine, potassium, phosphorous, and blood urea nitrogen in the serum were significantly (P< 0.05) elevated. In contrast, concentrations of serum chloride, sodium, and calcium were significantly (P< 0.05) decreased. The mean heart rate in control sheep (111±9 beats/min) was significantly (P< 0.05) lower than that in the intoxicated sheep (196±23 beats/min). In control sheep, a normal heart rhythm was observed in all cases except for sinus tachycardia (3 cases) and sinus arrhythmia (1 case). In experimental group, however, numerous arrhythmias such as sinus tachycardia (6 cases), supraventricular tachycardia (4 cases) atrial fibrillation (1 case) and atrial premature contraction (2 cases) were recorded. QRS complex and T-wave were large and expanded.

Conclusion: Acute salinomycin intoxication seems to cause supraventricular tachycardia in sheep which might be due to myocardial degeneration caused by the ionophore.

Keywords: Salinomycin, Toxicosis, Sheep, Arrhythmia, Biochemical parameters