

Changes of Blood Gases in Cases of Ethylene Glycol Poisoning

*Roberts Stasinskis, Viesturs Liguts,
Renars Erts¹, Aivars Lejnieks²*

*Rīga Stradiņš University,
Department of Anaesthesiology and Reanimatology, Rīga, Latvia
¹Rīga Stradiņš University, Department of Physics, Rīga, Latvia
²Rīga Stradiņš University, Department of Internal Diseases, Rīga, Latvia*

Introduction. The research conducted is of great importance because of limited available means to determine the presence of ethylene glycol in a human body in Latvia and no available means to determine concentration of the compound in a human body.

Aim. The aim of this study is to evaluate changes in blood gas in cases of ethylene glycol poisoning.

Material and Methods. 29 patients were included in the research according to the following criteria: anamnestic and clinical signs of ethylene glycol poisoning, confirmed presence of ethylene glycol in biological material. The following data has been analysed in the research – blood pH levels, value of lactate, osmolar and anion gaps.

Results. In the analysed group of patients, there were 8 deaths. It was difficult to obtain medical history from 23 patients due to severe somnolence.

The research included the following study:

- 1) the average level of lactate upon admitting the patient is 11.65 ± 10.16 mmol/l and in 48 hours the measurements show an average of 2.93 ± 2.19 mmol/l ($p = 0.01$);
- 2) the average level of pH for patients upon admittance in hospital was 7.14 ± 0.22 , and the average pH level in 48 hours was 7.44 ± 0.05 ($p < 0.001$);
- 3) the average anion gap upon admittance of a patient was 24.28 ± 9.21 mmol/l, and it is reduced to 10.63 ± 7.91 mmol/l ($p < 0.001$);
- 4) the average amount of osmolar gap upon admitting the patient was 97.98 ± 63.13 mmol/l, and in 48 hours measurements demonstrated an average of 28.28 ± 14.31 mmol/l ($p = 0.02$).

Conclusions. Poisoning is the cause of high levels of lethality. Confirmation of diagnosis is difficult due to insufficient data from history of poisoning. Diagnosis of ethylene glycol poisoning, based on changes in acid base analysis is complicated. Changes in lactate and pH levels correspond with the theoretically predicted. Reducing of anion gap over time could be caused due to the effect of the started therapy. Osmolar gap changes correspond with the theoretically predicted.