

## Androgenic Anabolic Steroids Abuse: A Case Report

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### Abstract

Little is known about androgenic- anabolic steroid (AAS) use among young people involved in fitness activities in Albania. Most of them are not well informed about health consequences associated with their use.

**Case report:** We report a case of a 37 years old man presented in emergency department with psychomotor agitation which was associated with AAS use. The patient was found unconscious in a bar and was transported to emergency department. On arrival, the patient was still unconscious, he had psychomotor agitation and blood from his mouth. Heart rate was 97/minute, arterial pressure was 170/97 mmHg, O<sub>2</sub> saturation 70%, blood glucose level was 82 mg/dl. The patient used to be drug intravenous

user, but during last months he was on methadone substitution treatment. It was referred from his familiars that he had diabetes mellitus and C hepatitis and last month he used some supplements for muscle building. Immediately upon arrival, all blood analyses were taken. Blood arterial gas resulted in severe acidosis with pH 7.03 and elevated levels of some enzymes; the most elevated enzyme was CK (39600UI/l). Looking the patient's clinical status, he was transferred to intensive care unit for further examinations and treatment. After several days, he came out of the hospital in good health conditions.

**Conclusion:** We must pay more attention to AAS use especially in patients with active fitness life.

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This case report highlights a risk for acute rhabdomyolysis among young men abusing AAS and using excessive amounts of supplements of unknown origin.

**Key words:** androgenic-anabolic, steroids, abuse, intravenous drug user

## INTRODUCTION

Anabolic- androgenic steroids (AAS) belong to a family of hormones produced synthetically that include testosterone, the naturally secreted hormone (1, 2). They have both anabolic and androgenic effects (3). The use of anabolic steroids has increased progressively over the recent years among young people involved in fitness activities in Albania. Currently there are no data records regarding the amount of these steroids being used or imported to Albania, the number of people which consumes them, or other data (4). However our confrontation with the everyday work in hospital settings, as well as communication with people has made us aware that the use of anabolic steroids has been increasing over the recent years. Imports in Albania come from different countries.

The side-effects caused by anabolic steroids are often dangerous, both physically and mentally (5). In addition they are often produced illegally, so there is the risk of being mixed with other potentially harmful drugs.

## CASE REPORT

A 37-year-old man was brought to the Emergency Department of the University Hospital Center "Mother Teresa" by ambulance. He was found lying down close to a bar by his friends who immediately called the ambulance.

At the moment of presentation the patient (height 178 cm, weight 97 kg) was unconscious. During inspection he was pale; he had hematomas mostly in the lower part of the back. Both pupils were

isocoric and reflective; heart rate was 97/minute, arterial pressure 170/97 mmHg; he had decreased breath sounds bilaterally and O<sub>2</sub> saturation (on pulse oximeter) was 70%. In the emergency room he experienced a convulsive attack. The arterial blood gas showed severe acidosis with pH 7.03 and BE -28.3 mmol/l. Because of the deteriorating situation, the patient was transferred to intensive care unit, where he was intubated and underwent an artificial respiratory regime with these parameters: IPPV, VT-650, FR-14/min; PEEP was different from 8-10-12 according to patient's needs and FiO<sub>2</sub>-100%.

Family medical history was taken from the relatives. The patient had type 2 diabetes mellitus and was treated with insulin. He was an ex-intravenous drug user for several years and recently had undergone methadone substitution treatment. The patient was also HCV positive and under treatment with antiviral drugs. On the advice of doctors the patient had joined a gym as a good method to help him abstain from using heroin. So, he started going to the gym three months before the emergency episode.

The patient had a longing desire to look good and healthy, thus he started to use anabolic-androgenic steroids. The situation was characterized by lack of information on the use of the aforementioned substances, the frequency of use, side effects etc. Most of the information was taken from friends.

A week prior to the episode had struck with the first complaints like fatigue, muscle aches and

drowsiness. All of them were neglected due to consideration that they were the result from all the activity. Hence another steroid agent was administered; yet without medical advice.

Table 1 shows the abnormal results of analyses upon arrival. The results showed electrolyte imbalances, where the most prominent was potassium, which was 5.7 mmol/l.

**Table 1.** The results of the first analyses

Parameter	Level	Reference range
WBC	12.0 * 10 <sup>3</sup> /mm <sup>3</sup>	4-10.0/ mm <sup>3</sup>
Hemoglobin level	17.1 g/dl	11-16.5 g/dl
HCT	55.6 %	39.0-50.0%
MCV	109 µm <sup>3</sup>	90-97 µm <sup>3</sup>
AST	1064 U/L	0-35 U/L
ALT	294 U/L	0-45 U/L
CK	39600 U/L	0-171U/L
CK MB	139 U/L	0-24 U/L
LDH	1682 U/L	125-250 U/L
Total protein	5.2 mg/dl	6.2-8.3 mg/dl
PT	45.2 %	70.0-120.0 %
INR	1.612	0.700-1.200

The EKG showed no significant changes, despite the high level of troponin in the blood (1.916).

Troponin level remained normal the next days.

Renal function tests like uremia and creatinemia were within normal ranges.

The urine analysis was normal, no myoglobinuria present.

The blood gas analyses showed severe metabolic acidosis: pH 7.03, HCO<sub>3</sub><sup>-</sup>, BE -28.3 mmol/l

Due to the high levels of enzymes, specifically very high level of Creatine kinase (CK), the complaints before the episode and the presence of

hematomas in the body, we established the diagnosis of “Rhabdomyolysis” as a result of the uncontrolled use of anabolic-androgenic steroids. Treatment started with high intravenous fluid replacement (up to 12 litres/24 hours) and bicarbonate to save the renal function, combining with furosemide 20 mg three times a day intravenously.

The level of CK (see table 2), and other enzymes began to decline rapidly after each consecutive day of intensive care. The patient was also treated with supportive and symptomatic treatment. The other biochemical parameters were within normal ranges during all the hospitalization period.

**Table 2.** Level of CK and other enzymes

CK	CK-MB	LDH	Hospitalization days
39600	139	1682	1st day
25580	125	1141	2d day
4863	42	824	3d day
4621	42	635	4th day
4160	38	502	5th day
2354	37	474	6th day
1297	38	320	7th day
540	35	287	8th day

## DISCUSSION

As soon as the patient was admitted to hospital the first diagnosis was “Psychomotor agitation” for determination, “Diabetes Mellitus” and “Chronic Hepatitis C”.

The laboratory tests confirmed that none of the previous diagnosis was accurate. None of the above mentioned diagnoses causes enzymatic changes to such a degree. Hence, the first step

was to determine the right diagnosis. Considering the fact that the patient was unconscious, it was impossible to take helpful information. When the family came to hospital they connected the patient's health condition to heroin relapse. After taking the exact medical history of the patient from his family members and friends and the hematomas present in his body and the laboratory tests (Figure 1), it was concluded that the diagnosis was "Rhabdomyolysis due to uncontrolled use of AAS".



**Figure 1.** The presence of hematomas caused from AAS use

Rhabdomyolysis or acute destruction of skeletal muscle encompasses several disorders such as toxic, infective, inflammatory and ischemic (6). Untrained individuals who exercise hard are at a higher risk; however well-trained athletes, bodybuilders, ballerinas, i.e. people who are engaged in high physical activities are at risk too.

Exertional Rhabdomyolyses occurs due to lack of the sufficient energy required to perform physical activity.

Rhabdomyolysis refers to the destruction of striatal muscle cell. Breakage of the cells membrane leads to leakage of intracellular content like creatine kinase, potassium, serum aspartate aminotransferase, lactate dehydrogenase etc.

Another reason is the uncontrolled AAS abuse of a toxic agent that is linked with rhabdomyolysis, reported in some case reports (6). Therefore rhabdomyolysis should be considered in the differential diagnoses of all cases with acute skeletal muscle pain and muscular weakness, for all the patients who report to have increased their physical activity lately, despite their previous level of physical activity, as well as the increased use of AAS (7,8).

When rhabdomyolysis is suspected, regardless of the underlying etiology, one of the most important treatment goals is to prevent acute kidney injury, by administering large amounts of intravenous fluids, correction of electrolyte imbalances and urinary alkalization with sodium bicarbonate. (9, 10). This patient was treated with large volumes of crystalloids (up to 12 l/24 h) and sodium bicarbonate with the main goal to achieve urinary output of 200-300 ml/h and plasma pH  $\leq$  7.5. The electrolyte imbalance were corrected as needed. CK level began to decline rapidly as it is shown in the table 2. The main reason of this rapid decrease of CK was the fact that the renal function remained intact. Renal function tests

(uremia and creatinine level) remained within normal limits during all days of hospitalization. AAS are synthetically produced hormones that include testosterone, a naturally secreted hormone (1, 2). All of them possess anabolic (muscle-building) and androgenic (masculinizing) properties (11). The most common types of AAS are anadrol, oxandrin, dianabol, winstrol, deca-durabolin, and equipoise (11).

## CONCLUSIONS

“Doping” among amateur athletes occurs frequently. Uncontrolled use of AAS can cause acute and chronic health problems, most of which are systemic. Therefore, since the use of these drugs is increasing, we should take into consideration these agents as a cause of different health issues especially in young patients.

As far as we know, this is the first case of publishing a case report with rhabdomyolysis due to uncontrolled use of AAS in Albania.

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None declared.

## Conflict of interest

None declared.

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