

Hemathologic Risk of Anabolic Steroids

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Abstract

The main objective of this clinical case presentation was to detect the real cause of a severe anemia syndrome (Hb=5 g/dL) in a young woman patient aged 25. I want to mention that she did not present clinical symptoms or signs of bleeding.

Keywords: Solubility; Biopharmaceutics Classification System (BCS); Solid dispersions; Complexation; Self-Emulsifying Drug Delivery System (SEDDS); Co crystallization; Ionic liquid formation

Case

I present the clinical case of a young woman patient, aged 25, a former athlete, who went to a sports highschool-undertook an athletics class for 12 years, which clinically presented nonspecific symptoms: asthenia, adynamia, dizziness, fatigue from exertions. Also the patient admitted the daily consumption of oral contraceptives pills for the last 7 years. On objective examination, the following are observed: pale skin (Figure 1), pale scleras (Figure 2) brittle nails, koilonychia (spoon nails), pale hands and pale palms creases (Figure 3), fine, glossy, friable hair (Figure 4) shown in the images below. Auscultation of the heart showed

innocent heart murmurs. Except this signs the objective examination was within normal limits.

After conducting a series of mandatory tests in school, the following results were detected: Hb=5 g/dL, red blood cells=3,040,000/mm³, Ht=24,6%, MCV=61, 0fL, MCH=17, 6 pg, MCHC=28,8 g/dL, RDW=18, 1%. Blood plates=395000/mm³, white blood cells=6230/mm³, leukogram: neutrophils=64, 37%, lymphocyte=27, 29%, monocytes=6, 24% eosinophils=0, 71%, basophils=1, 4% the reason for which she was immediately hospitalized with this severe anemia syndrome in the Hematology Department.

After the following complete investigations were performed: all hematologic tests complete (serum iron level, feritina, sideremia, morphological examination of blood smear relieved normochromic normocytic erythrocytes, tests auto hemolytic, osmotic fragility test, hemoglobin electrophoresis, Coombs test, reticulocytes, sternal puncture with morphological examination of bone marrow, cytogenetic tests), gastroscopy, colonoscopy, MRI-scan, gynecological examination,



Figure 1: Pale skin.



Figure 2: Pale scleras.



Figure 3: Pale hands and pale palms creases-natural hemoglobin meter (Hb<7 g/dl).



Figure 4: Fine, glossy, friable hair.

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tests for occult bleeding, all complete blood tests, the results were within normal limits and no cause of the anemia was found.

Because after all the investigations were completed the cause of anemia was not found the diagnosis was at that moment: anemia syndrome of unknown etiology.

Diagnosis

Unknown anemia syndrome.

Treatment

The patient was treated with iso-group, iso-Rh blood transfusions, transfusion of packed red blood cells until the values returned to a Hb=11 g/dL level. The patient was discharged from the hospital with the diagnosis of an unknown anemia syndrome and was followed a treatment with iron supplement tablets: Tardyferon (200 mg at 8 h) six months.

Evolution

After about 6 months, she repeated the blood tests, the Hb value being low again-6 g/dL, reason for which the patient was hospitalized again in the Hematology Department and all investigations are carried out again, including the sternal puncture, but this time as well the results are within normal limits, the anemia cause being still undetermined.

Treatment

The patient was treated again with iso-group, iso-Rh blood transfusions, transfusion of packed red blood cells until the values returned to Hb=10 g/dL, after which the patient was discharged from the hospital again with the diagnosis of unknown anemia syndrome and was followed at home an iron supplement tablets treatment-Tardyferon (200 mg at 8 h) six months.

Evolution

After about 7 months, when repeating the analysis the value was Hb=7,1 g/dL, she was again immediately committed to hospital, this time within the Internal Medicine Department.

After I repeated all the tests, there now appeared low value of reticulocytes=0, 3% (Normal range=0, 5-1, 5%) to suggest central aregenerative anemia (at the two previous hospitalization in the Hematology Department were within normal limits: 1, 3% and 1, 1%), morphological examination of peripheral blood releaved normocromic normocitic anemia and sternal puncture confirmed now a marrow suppression only in the red blood cell line.

Because she was a performance athlete at this moment I suspected anabolic steroids consumption and after a urine test for the use of anabolic steroids, this was determined as positive for Danazol and she recognized the consumption of this chemically substance, Danazol USP is 17 α -Pregna-2,4-dien-20-yno [2,3-d]-isoxazol-17-ol for two years, every day, oral administration of a 100 mg dose, once/day. In addition, these capsules contain also the following inactive ingredients: black iron oxide, Aluminum Lake, gelatin, lactose monohydrate, magnesium stearate, pharmaceutical glaze, propylene glycol, sodium starch glycolate, stearic acid and titanium dioxide. I mention that no other risks factors were discovered from history of the patient.

Diagnosis

The final diagnosis was: Marrow failure syndrome on red blood cell line after anabolic steroids consumption (Danazol).

Results and Discussions

After much detailed and complex investigations following repeated hospitalizations, the cause of the severe anemic syndrome of the young patient aged 25, athlete was still undetermined, after performing the blood transfusions, transfusion of packed red blood cells, the Hb values raised to a 10 or 11 g/dL value, and after a variable period of time, the Hb values relapsed to a level of 5, 6 or 7 g/dL, with the cause remaining undetected for a long period of time. Only at the moment where an anabolic steroid consumption appeared was the reality laid bare.

Conclusions

1. The use of anabolic steroids in young athletes is a known practice.
2. Perhaps, currently their side effects are not completely recognized, a fact that implies even more risks since young people are concerned, in which cancer evolution is faster and more risky, due to the increased cell turnover.
3. A warning should be made against these extremely dangerous practices and the consumption among young athletes should be stopped.
4. Information programmers should be conducted among young people, about the risks that they are taking when consuming anabolic steroids.
5. Also, women has a higher risk than men, because most of the time, they have the disadvantage of consuming both oral contraceptives pills and anabolic steroids, in most cases in an undeclared, un admitted and unknown manner, thus being even more difficult to diagnose, whose side effects being probably far less known and insufficiently studied.
6. These issues should be given a greater importance than they are given in the present throughout the world. The legislation didn't permit the consumption in this regard but the practices exist and make difficult the diagnosis.
7. The carcinogenic risk of anabolic steroid consumption in young athletes, is currently less known and insufficiently studied in the context of hematologic diseases, but the presented case above is suggestive in this regard and probably not unique but not reported.
8. It is possible, that after a constant consumption, a syndrome of bone marrow suppression should occur, especially on erythrocyte line combined with an accentuated haemolysis, due to the excessive physical effort, which leads to severe anemia, just like in the presented case above.