



**Hemodilution induced by desmopressin: implications in blood doping**

Sanchis-Gomar, F., Martínez-Bello, V. E., Nascimento, A. L., Romagnoli, M., Pérez-Quilis, C., García-Giménez, J. L., García-Valles, R., Ibañez-Sanía, S., Ferrando, B., Pareja-Galeano, H., García-López, E., Gómez-Cabrera, M. C., y Viña, J.

**Introduction:** Blood doping improves physical performance in sport. This is the reason why the World Anti doping Agency (WADA) submit to the athletes to blood tests to determine: hematocrit, hemoglobin and reticulocytes. If the analysis shows an atypical blood value, the athlete shall be deemed unfit for competition. Plasma volume expanders (e.g. albumin, dextran, hydroxyethyl starch) are prohibited agents used to reduce haematological values after its increase using different illegal practices. The aim of our study was to determine the role of desmopressin acetate (Minurin®) as a masking agent due to its hemodilution effect. We also wanted to test the possibility to determine its misuse with an easy although indirect method.

**Material and methods:** Venous blood samples were obtained, from eight physically active male subjects, before and 3 hours after supplementation with 0.3 mg of desmopressin acetate (DDAVP). The samples were analyzed for hematocrit, hemoglobin, reticulocytes, OFF Hr-Score, glucose, creatinine, albumin and total proteins.

**Results:** After treatment with DDAVP we found a significant decrease in the hematocrit, haemoglobin levels and on the OFF Hr-Score. We also found a significant decrease in glucose, creatinine, albumin and total proteins values; however, in this case, all the values were significantly below the physiological levels.

**Conclusions:** Treatment with DDAVP has a very effective hemodilution effect. We consider that this substance should be included in the WADA's prohibited list. The sharp decrease on the levels of the plasma parameters analysed after DDAVP administration, open up the possibility to detect the misuse of this drug by including glucose, creatinine, albumin or total proteins analysis during competitions.

**Key words:** Doping, hemoglobin, reticulocytes.