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SERUM CONCENTRATION OF SELENIUM, FOLATE, VITAMIN B12 AND FERRITIN IN FEMALE ELITE FIELD HOCKEY PLAYERS

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INTRODUCTION:

Micronutrients play an essential role in maintaining health and performance of athletes. In addition to their role as components and biocatalysts of metabolic processes, micronutrients also function as regulators of the immune system (1). The serum concentrations of the micronutrients selenium, folic acid, vitamin B12 (Vit B12) and ferritin in female elite hockey players have either not been investigated in depth so far (e.g. selenium, folic acid and Vit B12) or are still of interest due to poor implementation of substitution recommendations. The aim of this study was to analyse the serum concentrations of these micronutrients in the players of the German field hockey national team in order to detect possible deficits and develop sport- and gender-specific recommendations for micronutrient substitution.

METHODS:

33 German female hockey players (age: 23.9 ± 3.5 years; weight: 65.4 ± 6.7 kg; height: 170.4 ± 5.6 cm) playing in the first German national league and in the German national team were included. Venous blood sampling was done in the morning in a fasting state during the days of the yearly sport medical health examination. Whole blood was analysed for the concentrations of selenium and folic acid, and serum was analysed for Vit B12 and ferritin. The analyses were done by Ganzimmun Diagnostics GmbH, Mainz and their specific reference values (RV) were used. Results were corrected for haematocrit concentration. Descriptive statistics are presented as mean \pm standard deviation (range, RV).

RESULTS:

The mean concentrations of the four micronutrients were: selenium 122.0 ± 23.9 ng/ml (90-181 ng/ml, 101-170 ng/ml); folic acid: 220.0 ± 88.8 (112-570 ng/ml, 126-651 ng/ml); Vit B12: 318.0 ± 80.0 (168-493 ng/ml, 211-911 ng/ml); ferritin: 65.0 ± 39.4 (16-163 ng/ml, 35 (stage 1 iron deficiency)-150 ng/ml). The following number of athletes had values below the respective RV: selenium: n=5; folic acid: n=2; Vit B12: n=4; ferritin: n=10.

CONCLUSION:

Mean concentrations of selenium, folic acid, vitamin B12 and ferritin were within the reference ranges. A relevant number of athletes, however, had values below the respective lower limit. This was especially true for selenium. A deficiency in the selenium supply might lead to weakness of the immune system or impaired antioxidant capacity in situations of high training or competition loads (1). Some athletes were stage-1 iron deficient which might sooner or later lead to anaemia and reduced endurance capacity if the stores are not filled properly (2). Folic acid and Vit B12 were only reduced in a few athletes and might lead to anaemia when not substituted properly (1). Reduced selenium blood values are justifying a general supply of female athletes with selenium supplements. Ferritin should be checked on a regular basis in this population and iron substitution should be provided based on the individual value.

(1) Berger et al., Clinical Nutrition (2022)

(2) Burden et al., British Journal of Sports Medicine (2015)

Topic: Nutrition

Presentation: Poster

