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Relationship between Branched Chain Amino Acids and Insulin Resistance in Women's water polo and Women's Soccer Athletes

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INTRODUCTION:
To test the differences of branched chain amino acids(BCAA), insulin resistance and dietary intake index of female professional athletes and understand the occurrence of insulin resistance in female professional athletes. This study will provide research basis for the development of precise nutrition scheme for female professional athletes.
METHODS:
The index of BCAA and insulin resistance in 54 female professional athletes were measured, and then the correlation between them was analyzed. The differences of serum branched chain amino acids between insulin resistance group and non-insulin resistance group were compared. The differences of serum branched chain amino acids, insulin resistance related indexes and dietary intake levels in different projects were analyzed.
RESULTS:
Valine, isoleucine, leucine and BCAA were all positively correlated with blood glucose, HOMA-IR and skeletal muscle weight ($P < 0.05$). The levels of blood glucose, insulin, valine, isoleucine, leucine, BCAA and BMI in insulin resistance group were lower than those in non-insulin resistance group ($P < 0.05$). The BMI, skeletal muscle and blood glucose levels of young womens soccer were lower than that of adult womens soccer ($P < 0.05$), and the levels of total dietary energy, protein and carbohydrate intake were higher than that of adult womens soccer ($P < 0.05$). There was no significant difference between the two groups in insulin, HOMA-IR and HOMA-β ($P > 0.05$). The levels of insulin, HOMA-IR, HOMA-β, Valine, isoleucine, leucine and BCAA of female water polo players were higher than those of adult female soccers ($P < 0.01$). In addition, the levels of dietary total energy, protein, fat and carbohydrate were all higher than those of adult female soccer ($P < 0.01$).
CONCLUSION:
Insulin resistance exists in womens water polo and womens soccer athletes who are engaged in high-intensity sports activities. The levels of branched chain amino acids are significantly correlated with insulin resistance. It is suggested that female professional athletes should pay attention to insulin resistance. Young athletes with high energy demands can be administrated with BCAA appropriately. Adult female professional athletes with high BMI and high dietary protein and fat intake should control BCAA intake to prevent the occurrence of insulin resistance.

Topic: Nutrition

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