Differential expression of proteins in urea from male athletes after 30 km running evaluated by proteomics

Wen tao Lin1, HaiQi Lin2
1. Guangzhou Sport University
2. South China University of Technology

Objective In order to elucidate the target proteins of exercise-induced stress, differential expression of proteins in urine from male athletes after 30 km running was evaluated by proteomics.

Methods Urine samples were collected from ten male runners before and after 30 km running. The differential expression profile of urine proteins was investigated by using a proteomic approach based on two-dimensional gel electrophoresis (2-DE) and mass spectrometry (MS) procedures.

Results Totally 1011 ± 243 and 1737 ± 15 protein spots were detected from 2-DE of urine samples harvested from the subjects before and after 30 km running. In addition, 110 protein spots with differential expression were achieved. After exercise, 10 proteins with ≥5 fold up-regulation and 23 new proteins were observed; 18 protein spots with ≥5 fold down-regulation were observed and 6 proteins were disappeared. The target proteins were identified as zinc-α2-glycoprotein, albumin, vitamin D-binding protein, prostate-specific antigen, β-actin and Bence-Jones protein (BJP), which are correlated with the change of energy metabolism pathway, material transport and stress protection in the body.

Conclusions An obviously differential protein expression profile in urine samples from the subjects after 30 km running is achieved, which provides a new idea for further exploring exercise-induced proteinuria. However, further studies need to develop urine protein profiles of athletes, which will benefit for monitoring sport competition and doping control as well as excessive exercise-induced diseases.