Gastrointestinal Cell Injury and Perceived Symptoms after Running the Boston Marathon

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ABSTRACT

Gastrointestinal (GI) disturbances are a prevalent cause of marathon related complaints, and in extreme cases can promote life-threatening conditions such as exertional heat stroke. **PURPOSE:** Our aim was to study intestinal cell injury (via intestinal fatty acid binding protein [I-FABP]) and perceived GI distress symptoms among marathon runners. Potential risk factors (e.g., inadequate sleep) that could exacerbate GI disturbances in healthy, trained endurance runners were also examined. **METHODS:** A parallel mixed-methods study design was utilized. 2019 Boston Marathon participants were recruited via email. Before the race subjects completed surveys describing demographics and training history. Immediately pre-race, post-race, and 24-hours post-race participants completed a GI questionnaire to assess presence and severity of symptoms, a survey regarding risk factors (e.g., recent illness, medications) that could promote GI disturbances, and provided a urine sample. Due to weather, blood samples were only collected immediately and 24-hours post-race. **RESULTS:** A total of 40 runners (males: n = 19, age = 44.9 ± 10.8 years; females: n = 21, age = 44.8 ± 10.6 years) completed this study. I-FABP significantly decreased from post-race (3367.5 ± 2633.5 pg/ml) to 24-hours post-race (1657.3 ± 950.7 pg/ml, $t(39) = -4.228$, $p < .001$, $d = -.669$). A significant difference in overall GI symptom scores across the three time points occurred ($F(2, 39) = 41.37$, $p < .001$). Compared to pre-race (.09 ± .12) and 24-hour post-race (.44 ± .28), the highest average score occurred post-race (.84 ± .68). Post-race I-FABP ($r = .31$, $p = .048$) and post-race urine specific gravity ($r = .33$, $p = .041$) were significantly correlated with post-race GI symptom scores. **CONCLUSION:** Our study further supports the individualized presentation of GI disturbances, with participants experiencing a wide range of risk factors that can influence the extent of GI damage and perceived symptoms during and after exercise.