順天堂大学大学院スポーツ健康科学研究科 和文抄録
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女子長距離ランナーにおける除脂肪指数とFemale Athlete Triadの関連

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【目的】
本研究は、女子長距離ランナーの除脂肪指数(FFMI)を明らかにし、FFMIとFemale Athlete Triad(FAT)の関連について検討することを目的とした。

【方法】
被験者は18歳以上の長距離を専門とする女子長距離ランナー44名（20.98±3.27歳）であった。被験者は、早朝空腹時に二重エネルギーX線吸収測定法(DEXA)を用いて体組成と骨の状態を測定し、FFMIを算出した。同時に健康評価とLow Energy Availability in Female Questionnaire（LEAF-Q）に回答させた。また被験者44名中35名には血液検査を実施し、さらにそのうち18名に直近3日間の食事調査をおこない、栄養摂取量と利用可能エネルギー量（Energy Availability; EA）を分析した。

【結果】
被験者のFFMIは16.11±1.02kg/㎡であった。E2が20pg/mL未満のFFMI（15.52±0.42kg/㎡）は、20pg/mL以上（16.29±0.94kg/㎡）に比べ有意に低値であり、最近3ヶ月の月経周期が0～2回のFFMIは、3回～5回に比べ有意に低かった。また、FFMIと3年以内の疲労骨折の回数には有意な負の相関がみられた。LEAF-Qの得点は9.89±5.30で、EAは72%が30kcal/kgFFM/day未満であったことから、LEAの割合が非常に高い集団であったことがうかがえた。

【結論】
女子長距離ランナーはFFMIを高めることで、FATの予防に貢献することが示唆された。

Juntendo University, Graduate School of Health and Sports Science 英文抄録（Abstract）
2023 Master's Thesis

Relationship between Fat Free Mass Index and Female Athlete Triad in Female Long-Distance Runners.

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[Purpose]
The purpose of this study was to determine FFMI in female long-distance runners and examine the relationship between FFMI and FAT.□

[Methods]
The subjects were 44 female long-distance runners aged 18 years or more (20.98 ± 3.27 years) specializing in long-distance running. The subjects had their body composition and bone status measured using dual-energy x-ray absorptiometry (DEXA) during early morning fasting to determine FFMI. At the same time, they were asked to complete a health assessment and the Low Energy Availability in Female Questionnaire (LEAF-Q). In addition, 35 of the 44 subjects underwent blood tests, and 18 undertook a dietary survey for the around the measurement date to analyze their nutritional intake and energy availability (EA).

[Results]
The subject's FFMI was 16.11 ± 1.02 kg/m2. FFMI when E2 was below 20 pg/mL (15.52 ± 0.42 kg/m2) was significantly lower than when E2 was at least 20 pg/mL (16.29 ± 0.94 kg/m2). Furthermore, FFMI when the menstrual cycle was 0 to 2 cycles in the last three months was significantly lower than when it was 3 to 5 cycles. FFMI and the number of fatigue fractures within three years also had a significant negative correlation. The LEAF-Q score was 9.89 ± 5.30, and 72% of the EAs were less than 30 kcal/kgFFM/day, suggesting that the stud population had a high proportion of LEAs.

[Conclusion]
The results suggest that increasing FFMI prevents FAT in female long-distance runners.