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Epidemiological analysis of stress fractures in runners

Tiago Soares Baumfeld[1], Ryan Vitor[1], Thiago Aguiar[2], Vitor Masuda[3], Eli Ávila Souza Júnior[4], Hugo Bertani Dressler[5]

1. Faculdade de Medicina da UFMG, Belo Horizonte, MG, Brazil
2. Teo Esportes, Belo Horizonte, MG, Brazil
3. UNIFES, Belo Horizonte, MG, Brazil
4. Faculdade de Medicina, Universidade Federal de Alfenas, Alfenas, MG, Brazil
5. Hospital Mater Dei, Belo Horizonte, MG, Brazil

Correspondence: Tiago Soares Baumfeld. **Email:** tiago.baumfeld@gmail.com

Introduction: Stress fractures represent an important cause of sports absence in runners and result from the interaction between repetitive mechanical overload and biological capacity for bone remodeling. In Brazil, there is a shortage of epidemiological data that integrates intrinsic and extrinsic factors in risk analysis. Thus, this study aimed to investigate the incidence and multifactorial determinants of stress fractures among Brazilian runners, analyzing interactions between intrinsic (biological, metabolic, and biomechanical) and extrinsic factors (training load, equipment, and training location).

Methods: Cross-sectional observational study approved by the Research Ethics Committee, including 230 runners linked to sports advisory services, with a minimum training frequency of twice a week. The collection took place electronically, via email, and was disseminated to groups of amateur runners. Demographic, anthropometric, clinical, training-related, and metabolic health variables were evaluated.

Results: The overall self-reported incidence was 26.5%, with a higher prevalence among females (37.2%) than males (16.2%). The tibia was the most affected site (42.6%), followed by metatarsals (21.3%) and femur (11.5%). Running experience of more than three years and persistent pain during training were independent predictors. Regular practice of strength training proved to be a protective factor. In women, low BMI, high weekly volume, and amenorrhea were associated with a significantly higher risk.

Conclusion: Stress fractures in Brazilian runners have a multifactorial character. The interaction between female gender, low BMI and metabolic impairment showed greater relevance than mechanical load alone. The findings reinforce the need for integrated preventive strategies, including load control and metabolic, hormonal and nutritional screening.

Keywords: Fractures, stress; Metabolism.

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