Past Methylphenidate Exposure and Stress Fractures in Combat Soldiers: A Case-Control Study.

Schermann H, Ben-Ami IS, Tudor A, Amar E, Rath E, Yanovich R.

doi: 10.1177/0363546517741705

Abstract

BACKGROUND:
Previous research has revealed decreased bone mineral density (BMD) among children and adolescents who receive methylphenidate (MP) treatment for attention deficit hyperactivity disorder (ADHD). These findings have major clinical implications given that the prevalence of medication-treated ADHD is on the rise worldwide. We decided to investigate the clinical effect of MP exposure on the incidence of stress fractures, for which a low BMD is a risk factor.

HYPOTHESIS:
Exposure to MP is a risk factor for stress fractures.

STUDY DESIGN:
Case-control study; Level of evidence, 3.

METHODS:
This is a case-control study of combat soldiers who served in the military for 3 years between 2005 and 2015. The case group included 2400 soldiers with at least 1 stress fracture diagnosed by a bone scan. The control group comprised 6187 combat soldiers without a diagnosis of a stress fracture. The use of MP was determined by an automated text search of medical records and manual sorting of the results. Other study variables included age; sex; weight; height; body mass index (BMI); place of birth; and characterization of fractures by location, side, and grade. Odds ratios of stress fractures, the attributable proportion among the exposed, and the population attributable fraction were calculated using standard contingency tables. Logistic regression was fitted after adjusting for covariates.

RESULTS:
The previous use of MP was associated with a higher risk of stress fractures (odds ratio, 1.15 [95% CI, 1.07-1.24]). The attributable proportion was 13.2%, and the population attributable fraction was 0.3%. Logistic regression demonstrated an increased risk of stress fractures associated with past MP use, preserved after adjusting for BMI, sex, and place of birth (P = .005). Female sex, BMI ≤20 kg/m², and 20 < BMI ≤25 kg/m² were independent positive predictors of a stress fracture, while African origin was a negative predictor. Most participants who used MP had only 1 fracture (77.8%), while the majority of participants who did not use MP in the past had ≥2 coincident fractures (53.5%) (P = .003).

CONCLUSION:
This study supports the hypothesis that an MP-associated reduction in BMD has a clinical effect in the form of an increased incidence of stress fractures. The high percentage of fractures attributed to MP use may serve as a basis for risk stratification, that is, the referral of patients with a history of MP use to BMD measurements.