

骨密度に及ぼす運動と遺伝的素因の相互作用

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Interaction of Effects of Exercise and VDR Polymorphism on Bone Mineral Density

by

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ABSTRACT

The present study was designed to investigate the association between a polymorphism in vitamin D receptor (VDR) gene at the translation initiation site and mechanical loading on bone mineral density (BMD). In 237 young males, including 109 athletes engaged in weight-bearing sports, 48 competitive swimmers and 80 non-athletic controls, VDR genotypes were detected by endonuclease Fok I (FF, Ff and ff) and BMD of whole body, lumber and femoral neck were measured. Interestingly, the differences in whole body BMD between athletes and controls depended on the VDR genotypes; enhanced BMD in weight-bearing athletes was found in FF and Ff but not in ff. When swimmers were compared with VDR genotype-matched controls, lower BMD was observed only in FF. These findings suggest that the polymorphism in VDR gene at translation initiation site may interact with mechanical loading

to influence BMD, implying a new notion that the FF genotype appears to respond more sensitive to difference in mechanical load in regulating whole body BMD rather than to be a prediction factor of the high bone density suggested in previous reports.

要 旨

ビタミンD受容体（VDR）遺伝子の翻訳開始部位に存在する多型（Fok I）に着目し、運動トレーニングに対する骨応答に及ぼすVDR遺伝子型の影響を検討した。重量負荷型運動トレーニングを行なっている競技者の全身骨密度をVDR遺伝子型の一致する対照群と比較した場合の差異はFF型やFf型の保有者間でのみ認められ、ff型保有者ではVDR遺伝子型群と対照群との間に有意差はなかった。一方、非重量負荷型運動と考えられる競泳選手の全身骨密度はFF型においてのみ対照群よりも低かった。これらの結果は、重量負荷型運動競技者の全身骨密度の個体差にVDR遺伝子型（Fok I）が関わっており、FF型は高骨密度と関連する遺伝的素因ではなく、重量負荷の増減に対する感受性が高い遺伝子型であることを示唆していると考えられた。

緒 言