

OSTEOSCOOP

News on current events in osteoporosis and rheumatology

Impact of genetics on low bone mass in adults

N°128 – April 2010

Low bone mass in adults is a major risk factor for low-impact fractures, and is considered to be of complex origin because of interaction of environmental and genetic factors, each with modest effect. The objective of this study [1] was to assess the relative impact of genetics and environment, and quantify the risk in relatives of osteopenic individuals. The authors studied 440 Icelandic nuclear families with 869 first-degree relatives of both sexes. Index cases (male or female) had BMD in the lumbar spine or hip >1.5 SD less than sex-matched controls. Heritability of BMD was estimated by maximum likelihood method, and variance component analysis was used to partition the genetic and environmental effects. Relative risk of low BMD (< -1 SD) in first-degree relatives was estimated, and heritable decrement in BMD was calculated compared with controls.

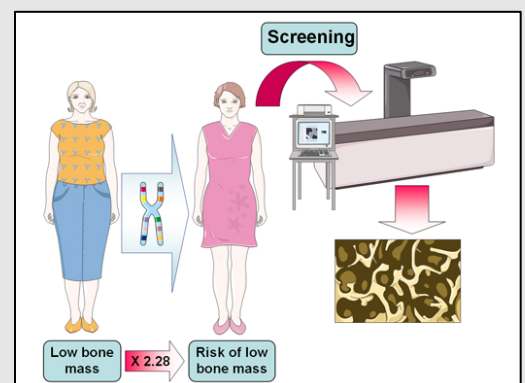
Heritability was estimated as 0.61–0.66. Relative risk among first-degree relatives was 2.28, and the yield of screening was as high as 36%. The genetic influence was consistent with one or a few genes with considerable effect in addition to multiple genes each with a small effect. The genetic deficit in BMD was already present before 35 yr of age, and equalled bone loss for 8 to 30 yr after menopause.

This study confirmed that genetics are more important than environment in low bone mass in adults. These results are consistent with a few underlying genes with considerable effect. The prevalence among first-degree relatives of both sexes is common, suggesting that screening them should be cost-effective and informative, to elucidate the underlying genetics.

1. Sigurdsson G et al. *J Bone Miner Res.* 2008;23:1584–1589.

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