Muscle mass important for maintaining bone density in women

Studies have found that women with HIV infection are at high risk for developing thinner-than-normal bones. The precise cause for this in HIV positive women is not yet clear, but there may be a variety of factors at work, including the following:

- age
- smoking tobacco
- lower-than-ideal body weight
- reduced levels of the hormones estrogen and testosterone

To try to find out more about the effects of weight, body composition and testosterone levels on bone density, researchers at Harvard University conducted a study. Their findings suggest that a number of factors can affect bone density in HIV positive women.

Study details

Researchers enrolled 152 HIV positive women and 100 HIV negative women who were similar in age and race. They divided the women into three groups as follows:

- HIV positive women with low body weight; body mass index (BMI) of 19
- HIV positive women with normal weight; BMI of 26
- HIV negative women whose weight was somewhat greater than normal; BMI of 27

Researchers use BMI to help them decide if a person’s weight is within an acceptable range. BMI is calculated by dividing a person’s weight (in kg) by the square of their height (in m).

In our report we will focus on the HIV positive women. Here is their average profile:

- age – 40 years
- most were taking anti-HIV therapy
- about 55% currently smoked tobacco

Bone density was assessed by means of DEXA scan and fat and muscle content of the body were assessed using CAT scans. Researchers also assessed levels of the hormone testosterone.

Results

Levels of testosterone were lower among HIV positive women than among HIV negative women. Testosterone deficiency was found in the following proportion of women in each group:

- HIV positive women with low body weight: 27%
- HIV positive women with normal body weight: 19%
- HIV negative women: 12%

Levels of other hormones, such as estrogen and FSH (follicle-stimulating hormone), were not different among the three groups of women.

Bone mineral density

The general trend within the study, whether for the hip or spine, was that bone density was lowest in thin HIV positive women and highest among HIV negative women.
The proportion of women in each group with moderately thin bones (osteopenia) was as follows:

- HIV positive women with low body weight: 50%
- HIV positive women with normal body weight: 30%
- HIV negative women: 20%

The proportion of women in each group with more serious bone loss (osteoporosis) was as follows:

- HIV positive women with low body weight: 12%
- HIV positive women with normal body weight: 6%
- HIV negative women: 3%

**Points to consider**

Key findings from this study are as follows:

- Bone density at the spine and hip is reduced in HIV positive women with lower-than-normal weight.
- This bone loss seems to be greater than previously reported in other studies.
- Bone thinning also occurs in HIV positive women with normal body weight, but this loss of bone density is much less than in underweight people.
- Testosterone deficiency was very common among women with osteopenia and osteoporosis.

Having less-than-normal levels of testosterone may make it more difficult for the body to build up and maintain muscle mass. Muscles are joined to bone, and exercising muscles stimulates bones and helps strengthen them.

Other findings from this study:

- The women enrolled were relatively young—40 years old—yet nearly 40% of the HIV positive women had menstrual irregularities such as skipped periods. This problem was only present in 18% of the HIV negative women. Other studies in HIV negative women suggest that menstrual dysfunction is linked to an increased risk of bone loss.
- White women had a greater increased risk for thin bones than Black women.

Based on the results of this study (as well as others), the scientists suggest that more research needs to be done to find out if some HIV positive women with menstrual dysfunction and lower-than-ideal body weight can benefit from supplements of low doses of estrogen.

Additionally, they also note the possibility that some HIV positive women with menstrual dysfunction and thin bones may benefit from supplements of low-dose testosterone.

**REFERENCE:**

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