Lower Bone Mass in Adolescents With HIV Raises Concerns

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Male teens and young adults recently infected with HIV and currently receiving antiretroviral therapy have lower bone mass than HIV-negative individuals their age, according to the results of an Adolescent Trials Network (ATN) study published ahead of print by Clinical Infectious Diseases.

“Although the clinical significance and potential impact on peak bone mass and subsequent fracture risk are not known and will require longitudinal studies,” the researchers note, “risk reduction through changes in diet and lifestyle is warranted.”

During childhood, puberty and adolescents, bones become larger, denser and stronger. Peak bone mass, defined as the maximum bone density a person will have, is usually achieved by the end of adolescence.

Some experts worry that shunted bone mass development—potentially caused by HIV or its treatment—will result in suboptimal peak bone mass in adolescents, thereby further increasing the chances of early onset osteopenia, osteoporosis and serious bone fractures, which are already a growing concern among people living with HIV.

To explore this potentially crucial issue, Kathleen Mulligan, PhD, of the University of California at San Francisco, and her ATN colleagues conducted a bone density study involving more than 250 young men between ages 14 and 25.

Roughly 200 of the volunteers were living with HIV, all of whom were infected through sexual activity or drug use. About half were receiving antiretroviral therapy, either with a non-nucleoside reverse transcriptase inhibitor- or protease inhibitor-based regimen. Nearly 90 percent of the study participants identified themselves as African American or Latino, and all lived in urban areas.

The participants underwent whole body scans to measure their bone density as well as the distribution of fat and lean muscle mass in certain regions of their bodies. Participants also answered questions about their medical history as well as diet, exercise and other lifestyle habits.

The young men living with HIV had hip bone density levels that were 5 to 8 percent lower than those documented in volunteers not living with the virus. Average bone density measurements of volunteers’ spines were 2 to 4 percent lower among those living with HIV.

Bone density and bone mineral content—notably calcium—tended to be lowest in participants receiving antiretroviral therapy. HIV-positive adolescents not yet receiving HIV treatment had higher bone mass levels than those who were on therapy, but lower levels than those who were HIV negative.

Mulligan and her colleagues explain that their study was not designed to determine the cause of the bone loss and cannot rule out the possibility that low bone mass preceded the young men's HIV infection. According to questionnaires conducted by the researchers, it became apparent that at least half of the young men were not consuming enough calcium or vitamin D as a part of their diets, 30 percent were cigarette smokers and roughly 50 percent were not getting regular exercise—all risk factors for poor bone growth and bone mineral loss.

"None of the young men we saw is in immediate risk of fracture," said Mulligan in an accompanying news announcement. "However, our results indicated that it would be a good idea for young men newly diagnosed with HIV to make sure they exercise, get enough calcium and vitamin D, quit smoking and limit alcohol consumption."
