

Stimulant Use Tied to Reduced Bone Density in Kids With ADHD

Miriam E Tucker | April 04, 2016

BOSTON — Use of stimulant medications for treating attention-deficit/hyperactivity disorder (ADHD) in children appears to be associated with bone loss, new research shows.

The analysis of data from the 2005–2010 National Health and Nutrition Examination Survey (NHANES) were presented here at [ENDO 2016](#) by Alexis Jamie Feuer, MD, assistant professor of pediatrics and a pediatric endocrinologist at Weill Cornell School of Medicine, New York, New York.

The study population included a total of 6489 NHANES participants aged 8 to 20 years, of whom 159 were receiving stimulants (primarily amphetamines or amphetamine analogs) for ADHD. After adjustment for confounders, those using the medications had a total 3.9% lower bone density at the lumbar spine and 3.7% lower bone density at the femoral neck compared with nonusers.

"These findings indicate that bone health may be a serious concern for kids and teens using stimulants. We know that failure to attain appropriate bone density by young adulthood puts an individual at increased lifetime risk of fractures and osteoporosis," Dr Feuer said during a press briefing.

Based on the results, "I firmly believe that, moving forward, clinicians caring for children taking stimulants should immediately begin screening them for bone health. Fortunately, a child's bone health can be comprehensively screened through careful monitoring of their linear growth and weight gain and ensuring these children receive adequate weight-bearing exercise and have sufficient vitamin D levels," Dr Feuer said at the briefing.

This is one of the first studies to examine the effect of amphetamines and related compounds on bone, say the researchers.

And the finding is cause for concern, session moderator Sundeep Khosla, MD, of the Mayo Clinic, Rochester, Minnesota, told *Medscape Medical News*. "Treating kids with stimulants raises the question, 'Are you going to impair their skeletal mass acquisition?' because sympathetic outflow does seem to influence bone mass. You're increasing sympathetic action on bone."

Further studies will need to determine whether the effects of stimulants on bone are reversible, he added. "Maybe these kids don't progress as well in terms of bone mass acquisition, but 10 years down the road have they caught up? If they haven't, then the concern is long-lasting effects of these stimulants on bone."

Differences in Bone Seen When Medication Taken for Longer Than 6 Months

Among the children studied, total femur, femoral neck, and lumbar spine bone-mineral content (BMC) and bone-mineral density (BMD) were assessed using dual-energy X-ray absorptiometry (DXA) and the results adjusted for height and weight Z-scores, age, sex, ethnicity/race, poverty–income ratio, physical activity, vitamin D level, and serum cotinine.

Stimulant users had significantly lower lumbar BMC (13.17 vs 13.87 g), a difference of $-5.1%$ ($P = .005$). Lumbar BMD was 0.92 g/cm^2 in stimulant users vs 0.95 g/cm^2 in nonusers, a $-3.9%$ difference ($P = .02$).

Femoral neck BMC was also significantly lower in stimulant users vs nonusers ($-3.7%$ difference, $P = .03$). For femoral neck BMD, the difference approached statistical significance ($-3.7%$, $P = .08$).

Total femur BMC was lower by $-4.9%$ in stimulant users ($P = .10$) and BMD by $-4.1%$ ($P = .05$).

After multifactorial adjustment, those treated with stimulants for longer than 6 months had significantly lower BMD at the lumbar spine and femur compared with nonusers, and there was a nonsignificant trend for femoral neck BMD.

In contrast, no significant differences were seen in BMD at any site for those who used stimulants for less than 6 months compared with nonusers.

For BMC at the lumber spine and femoral neck, the differences between stimulant users and nonusers were also only significant among those using them for longer than 6 months.

In conclusion, Dr Feuer said that the results indicate that children and adolescents using stimulants have lower height-adjusted bone-mineral content and density compared with nonusers and that duration of therapy is correlated with BMC and BMD.

Monitoring Kids' Bone Health While Awaiting Prospective Studies

At the briefing, Dr Feuer outlined recommendations for bone monitoring of children and adolescents treated with stimulants, including ensuring a calcium intake of 800 to 1300 mg daily and 60 minutes of weight-bearing exercise or activity every day, and monitoring vitamin D levels, providing supplementation if needed.

However, she said that DEXA scans should only be used if clinically indicated and not for routine screening, even in at-risk kids.

In response to a question from *Medscape Medical News* about the implications of her work, she said that her findings don't imply that stimulants should not be used in children who need them for treating ADHD.

"We've identified that stimulant use may be a risk factor for lower bone density. But that doesn't mean stimulants should not be used....We do need prospective studies to see what effects stimulants may have with chronic treatment, but if you monitor for bone health in these kids, that should be sufficient while they're on stimulant therapy."

And Dr Khosla pointed out that this is just an initial study.

"Longitudinal data are needed. The kids who go on these drugs may have other risk factors that cause them to have a low bone mass, even though they adjusted for that."

Dr Feuer has no relevant financial relationships. Disclosures for the coauthors are listed in the abstract.

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