Lowest-Dose OCs May Not Optimize Teen BMD

BY DIANA MAHONEY
New England Bureau

ATLANTA — Impaired bone mass acquisition associated with certain oral contraceptives may be a hidden public health problem affecting adolescent girls, Dr. Barbara Cromer said at the annual meeting of the North American Society for Pediatric and Adolescent Gynecology.

Preliminary data from a pilot study comparing bone mineral density in adolescent girls using oral contraceptives containing two different levels of estrogen demonstrated an apparent blunting of bone development gains associated with the lower-estrogen pill, said Dr. Cromer of MetroHealth Medical Center in Cleveland.

The adverse skeletal effects of hormonal contraceptives have come under scrutiny in recent years, particularly as studies have linked the use of depot medroxyprogesterone acetate (DMPA) to bone mineral density (BMD) loss in adolescents, Dr. Cromer said. The relationship between oral contraceptives and BMD is less clear, however. "While some studies in premenopausal women suggest positive or no effects on bone mass associated with oral contraceptives, there is conflicting evidence about whether ultralow-dose oral contraceptives [containing 20 mcg ethinyl estradiol] interfere with the large increases in bone mineral density normally observed in adolescence," Dr. Cromer said. On the other hand, low-dose oral contraceptives—those containing 30-40 mcg of ethinyl estradiol—seem to offer some bone protection in young adult women, she said.

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Because an estimated 25%-40% of a woman's peak bone mass is acquired during the teen years, optimizing bone development during this period is considered the most important factor in the primary prevention of osteoporosis.

To determine whether and to what degree ultralow-dose oral contraceptives—which are thought to decrease the associated risk of venous thromboembolic events (VTE) in adult women relative to combined oral contraceptives with more estrogen—Dr. Cromer and colleagues undertook a single-blind randomized clinical trail in adolescent girls comparing the skeletal effects associated with oral contraceptives containing 20 mcg and 35 mcg of ethinyl estradiol.

Of 12 girls aged 12-18 years included in the study, 5 received a combination oral contraceptive with 20 mcg of ethinyl estradiol and 1 mg of norethindrone acetate for 12 months and 7 received one with 35 mcg of ethinyl estradiol and 1 mg norethindrone for the same duration. The mean age of subjects in the 20-mcg group was 15.2 years, compared with 15.6 years for the 35-mcg group. Half of the lower-dose estrogen group was African American, compared with 62% of the higher-dose group, said Dr. Cromer.

All of the girls underwent BMD testing with dual-energy x-ray absorptiometry at the lumbar spine (L1-L4) and at the femoral neck at baseline, at 6 months, and 12 months. The main outcome measure was percent of change in BMD.

At 12 months, the mean percentage of change in bone mass acquisition from baseline in the lower-estrogen group was 1%, compared with 2% in the higher-dose group, Dr. Cromer reported.

Although the study was not powered to detect statistical significance, the observed differences in bone development raise important questions, said Dr. Cromer. "The first question is obviously whether the difference is clinically significant, and it's one that absolutely warrants further investigation," she said. "If there is clinical significance, we need to think about whether the appropriate dose of ethynyl estradiol for teens may be 35 mcg and whether the trade-off with the risk of VTE—which is relatively small in adolescents—is acceptable." Additional questions include whether and to what degree bone mass recovery occurs after cessation of these agents and whether lifestyle factors, including nutrition and physical activity, can override some of the negative bone effects, she said ■