

Preterm babies with low birth weight may be at increased risk of osteoporosis

Adults who were born prematurely or at a below average weight are more likely to have weaker bones and an increased risk of fracture and osteoporosis later in life. This research, presented at the European Congress of Endocrinology, could lead to recommendations that high-risk individuals follow diets rich in calcium, vitamin D and protein, and undertake weight-bearing exercise.

Worldwide, approximately 10% of babies are born preterm and are subject to multiple health risks later in life. The human body concentrates calcium for bone development during the third trimester of pregnancy; if this is interrupted due to premature birth, babies may risk suffering poor bone health later in life.

This study by researchers at the Norwegian University of Science and Technology examined the bone mass of 186 adults, of both genders. Peak bone mass is achieved between 20 and 30 years of age and is a good indicator of fracture risk; the sample was therefore made up of adults of 26-28 years of age. Of these 186 individuals, 52 were born prematurely with very low birth weight (1265g) and 59 were born at term but with low birth weight (2950g). The further 75 – who were born at term with average birth weight (3700g) – formed a control group.

The researchers found that both low birth weight groups had a lower peak bone mass than controls. However, once height – a factor which greatly influences bone mass – was adjusted for, this lower bone mass was accounted for in the group born at term; the research showed that low bone mass in this group was partly due to smaller body size. This was not the case in the preterm, very low birth weight group where body size alone could not account for the low bone mass, highlighting this group as particularly high risk. Differences in physical activity and calcium intake were also adjusted for, and differences in bone mass between groups still persisted. Smoking habits did not differ between the groups, and the occurrence of previous fractures was also similar.

Dr Chandima Balasuriya, who led the study, states that follow-up of these children is important. “Ensuring children with low birth weight have a diet rich in calcium, vitamin D and protein, in combination with exercise regimes involving weight-bearing physical activities, will help reduce risk of bone fractures later in life.”

The next stage for the research will be to look at what causes babies to be born with low birth weights. “We want to examine the ultrasounds to determine whether low birth weight babies are genetically programmed to be smaller, or if it might be a result of growth restriction. We are also analysing mothers’ blood to see how vitamin A and D status might relate to their children’s bone health,” said Dr Balasuriya.

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Influence of Prematurity and Low Birth Weight on Peak Bone Mass

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Introduction: Intrauterine weeks 36-38 with rapid transplacental mineral transfer are crucial for skeletal development. Prematurity and low birthweight may therefore lead to a subnormal peak bone mass. We evaluated the influence of gestational age and low birthweight on bone mineral density (BMD) and content (BMC) in young adults born preterm with very low birthweight (VLBW) and small for gestational age (SGA) at term.

Description of Methods/Design: Altogether, 186 subjects (females= 95) 26-28 years of age were included. Of these, 52 were born preterm with VLBW (< 1500g), 56 born SGA at term (<10th percentile) and 75 controls born at term with normal birthweight (> 10th percentile). Weight, height, previous fractures, smoking, physical activity, calcium and vitamin D intake were recorded. BMC and BMD at spine, femoral neck, hip and whole body and spine trabecular bone score (TBS) were measured by DXA. Serum bone markers were analyzed.

Results: The VLBW and SGA groups were significantly shorter compared to controls. The VLBW group was more physically inactive and reported higher calcium intake. Previous fractures, smoking and vitamin D were similar between the groups. The VLBW group exhibited significantly lower BMC and BMD at most sites measured, also controlled for known confounders. Femoral neck BMD was 6.7% lower in VLBW. BMD was apparently dependent on gestational age, as each additional week of gestation resulted in 0.037 units increase in femoral neck Z- score. The SGA group displayed lower BMC at spine and lower whole body Z-score. No differences were observed in TBS or bone markers, except for higher Dkk1 in the VLBW groups.

Conclusion: Adults born premature with VLBW and SGA at term displayed significantly shorter height, and lower BMC and BMD compared to controls. The lower peak bone mass may imply an increased fracture risk in the future.

Notes for Editors

1. For further information about the study please contact:

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2. The study "[Influence of prematurity and low birth weight on peak bone mass](#)" is a poster presentation at the European Congress of Endocrinology at the ICM in Munich, Germany.
3. For other press enquiries please contact the ECE 2016 press office:

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4. The European Congress of Endocrinology is held at the Internationales Congress Center München between 28-31 May 2016.
5. The [European Society of Endocrinology](#) was created to promote research, education and clinical practice in endocrinology by the organisation of conferences, training courses and publications, by raising public awareness, liaison with national and international legislators, and by any other appropriate means.