A daily physical activity programme increased the rate of weight gain and bone mass in preterm very low birth weight infants


QUESTION: Is a daily physical activity programme effective in increasing body weight and bone mass in preterm very low birthweight infants?

Design
Randomised (unclear allocation concealment), blinded (unclear), controlled trial with a mean follow up of 25 days.

Setting
A newborn intensive care unit in a university hospital in Salt Lake City, Utah, USA.

Patients
32 healthy preterm infants (53% boys) who had birth weights between 800 and 1600 g (mean 1271 g), gestational age between 26 and 32 weeks (mean 30 wks), appropriate body size, were tolerating enteral feedings at ≥110 kcal/kg of body weight/day, and were not on medications other than appropriate vitamin supplements. Follow up was 100%.

Intervention
After stratification by birth weight and gestational age, infants were allocated to the physical activity group (n = 16) or the control group (n = 16). Infants in the physical activity group received daily range of motion exercises with gentle compression and extension or flexion against passive resistance to all extremities for 3–10 minutes. Infants in the control group had a daily interactive period of holding and stroking but no range of motion activity. The intervention continued until a body weight of 2.0 kg was achieved. Infants in both groups had similar nutrient intakes that met the recommended needs for preterm infants.

Main outcome measures
Rate of change in body weight, forearm bone length, bone area, bone mineral content, lean and fat mass, length, head circumference, and serum and urine concentrations of bone mineral status.

Main results
Infants in the physical activity group had a greater rate of mean daily weight gain compared with those in the control group (16.3 v 14.6 g/kg/d, p = 0.02) and greater gains in forearm bone length (4.0 v 3.1 cm, p = 0.02), bone area (2.0 v 1.0 cm², p = 0.02), bone mineral content (231 v 131 mg, p = 0.05), and lean mass (5.3 v 4.9 g, p = 0.04). The groups did not differ for length, head circumference, fat mass, or serum or urine values.

Conclusion
In preterm very low birthweight infants, a daily physical activity programme increased the rate of gain in body weight, forearm length, bone area, lean body mass, and bone mineralisation.