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Title: Evaluation of bone metabolism in patients receiving home ventilation

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Body: Background: Children with long-term respiratory support in intensive care units can be discharged home due to the developments in ventilator technology. Osteoporosis and related bone fractures can be seen in these patients due to immobilization and low exposure to the sun light. Our study aim was to evaluate bone metabolism and prevalence of vitamin D deficiency and related factors in children who are on respiratory support at home. Methods: Plasma calcium (Ca), phosphorus (P), alkaline phosphatase (ALP), osteocalcin, 25 (OH) D3, spot urine calcium/creatinine ratio and the level of pyrilinks-D were detected. Patient outcomes were evaluated according to age-specific normal values. Vitamin D level was assessed by plasma 25(OH)D3. 25 (OH)D3 level <10ng/ml and 10-25 ng/ml was defined as severe and mild to moderate deficiency respectively. Results: The study included 21 children (52% female). Mean age was 6.4 ± 4.6. Mean duration of ventilatory support was 2.7 ± 1.5 years. Five (23.5%) patients were receiving vitamin D as maintenance dose. Mean 25(OH)D3 level was 36.9 ± 1.9 ng / ml and vitamin D level was low in 39% (severe in 6%, mild to moderate in 33%) of patients. Hypercalcemia (Ca> 10.8 mg / dl) was detected in 2 (10%) patients. Spot urine Ca /creatinine ratio and pyrilinks-D was found to be increased in 25% and 83% of patients, respectively. Conclusions: Vitamin D deficiency and markers of bone resorption are detected high in patients receiving home ventilation. In addition, hypercalcemia of immobilization is a common problem. For this reason, supplementation of vitamin D in optimal doses that does not cause hypercalcemia is essential and bone health can be protected with intense physical therapy.