Vitamin D Deficiency In Patients With Acute Respiratory Failure

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Rationale: Vitamin D deficiency is common in the general population and represents a major health problem. In addition to acting as a regulator of calcium and phosphate homeostasis its immunomodulatory effects and potential role in chronic disease is increasingly recognized. The Third National Health and Nutrition Survey (NHANES III) reported a strong relationship between 25-hydroxyvitamin D (25-OHD) serum levels and pulmonary function studies in healthy subject. There is evidence that patients with chronic inflammatory lung diseases are at increased risk of vitamin D deficiency, and studies suggest that vitamin D supplementation may increase proximal skeletal muscle strength. We investigated for a relationship between vitamin D deficiency and acute respiratory failure.

Methods: All patients admitted to our Respiratory High Dependency Unit with either Type 1 or Type 2 Respiratory failure over a 2 month summer period were included. 25-OHD and PTH levels were measured on admission. Profound 25-OHD deficiency was defined as <25ng/ml.

Results: All patients studied (n=21; mean age 68+/-16.8; 57.1% female; 100% Caucasian) were Vitamin D deficient (mean 23.33ng/ml +/-16.20; median 18.00ng/ml). Causes of the acute respiratory failure (90.5% Type 2 Respiratory Failure; 9.5% Type 1 Respiratory Failure) included pneumonia (23.8%), COPD exacerbation (47.6%), and asthma exacerbation (4.8%). In hospital mortality (19%; n=4) was associated with a decreased vitamin D level (15.50ng/ml) when compared with patients surviving to discharge (25.18ng/ml).

Conclusion: No patient with acute respiratory failure of any cause was Vitamin D replete. The majority of patients were profoundly deficient in Vitamin D. Lower Vitamin D levels may be associated with an increased risk of mortality. Further research is warranted to investigate the relationship between acute respiratory failure and Vitamin D levels and to investigate whether replacement of Vitamin D in patients with acute respiratory failure improves muscle strength and survival.

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