Impact of Parenteral Compared to Oral Vitamin D3 (25-OH Cholecalciferol) Therapy on the Bone Pain Frequency and Serum Level of VD in Adult Patients with Homozygous Sickle Cell Anemia

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Background: Bone pain frequency and optimal methods of vitamin D (VD) administration in adult patients with sickle cell anemia (SCA) are unclear.

Objective: To assess bone pain frequency and level of VD in adult SCA patients after vitamin D medication.

Setting: Salmaniya Medical Complex, Bahrain.

Design: A Prospective Controlled Trial.

Method: The study was performed from 1 January 2013 to 31 December 2014. Sixty-nine SCA patients were studied and compared with an age and gender-matched control group. Bone pain frequency was assessed using Visual Analogue Scale (VAS). Measurement of serum level of VD, parathormone (PTH), calcium and alkaline phosphatase (ALP) at baseline, one and three months after treatment. Vitamin D Deficiency (VDD) was defined as <50 nmol/L. The mean difference of biochemical and clinical parameters was compared using paired Student t-test.

Result: Fifty-one (74%) patients from the study group and 14 (20.3%) patients from the control group had VDD. Twenty-six (37.7%) patients were treated with IM injection of 600,000 IU once and 25 (36.2%) were treated with oral capsule of 50,000 IU weekly. Patients on IM treatment had pain frequency of 56 episodes per month before treatment, which was reduced to 43 ($P<0.05$) after one month; further reduction to 34 episodes ($P<0.01$) was achieved after three months. Patients on oral medication had pain frequency of 57 episodes per month before treatment, which reduced to 50 episodes after one month ($P<0.05$) and 40 after 3 months ($P<0.01$).

Vitamin D level increased to 54.15±2.73 in one month compared to 19.55±9.63 nmol/ml ($P<0.05$) before treatment. Patients on oral medication had VD increment of 31.64±4.44 compared to 22.11±9.46 nmol/ml ($P<0.05$) after one month and 53.69±2.37 nmol/ml after three months ($P<0.001$).

Conclusion: Frequency of bone pain was reduced significantly in adult SCA patients with VDD after one month of treatment of vitamin D3 injection with normalization of serum level.

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