

## Original Research Article

**Serum Vitamin D Status in reflux nephropathy**

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**Abstract:** This study was designed to assess serum vitamin D status (25-OHD) in the reflux nephropathy patients and to compare it with a no reflux nephropathy control group. It also aimed to investigate the correlation of serum vitamin D level with vesicoureteral reflux severity and invalidation experiences. A total of 230 consecutive patients with RN and 240 Non RN control participants were enrolled. Venous blood samples were drawn from all participants to evaluate serum 25-OHD levels. Mann-Whitney tests and multiple logistic regression analyses were performed and Spearman's correlations were calculated. 470 children were examined (230 RN and 240 NRN). The deficiency (<10ng/ml) 36 % in RN and 2% NRN (p-value 0.0001), insufficiency (10-30ng/ml) 43% in RN and 5% in NRN (p-value=0.0003), sufficient (30-150ng/ml) 21% in RN and 93% in NRN (p-value=0.002) and potential intoxication (>150ng/ml) 0% in two group of vitamin D were observed in analyzed children with RN. There were no significant differences in serum calcium, phosphorus and gender. This study showed that although high rates of vitamin D insufficiency or deficiency were seen among RN patients and NRN participants, Addressing of invalidation experience especially by the patient's spouse is important in management of RN.

**Keywords:** reflux nephropathy, serum vitamin D status.

**INTRODUCTION:**

Vitamin D can be synthesized in skin epithelial cells and therefore technically is not a vitamin. Cutaneous synthesis is normally the most important source of vitamin D and depends on the conversion of 7-dehydrocholesterol to vitamin D<sub>3</sub> by ultraviolet B radiation from the sun [1]. The efficiency of this process is decreased by melanin; hence, more sun exposure is necessary for vitamin D synthesis in people with increased skin pigmentation [2]. Measures to decrease sun exposure, such as covering the skin with

clothing or applying sunscreen, also decrease vitamin D synthesis. Children who spend less time outside have reduced vitamin D synthesis. The winter sun away from the equator is ineffective at mediating vitamin D synthesis [3]. Vesicoureteral reflux refers to the retrograde flow of urine from the bladder to the ureter and kidney. The ureteral attachment to the bladder normally is oblique, between the bladder mucosa and detrusor muscle, creating a flap-valve mechanism that prevents reflux [4]. Reflux occurs when the submucosal tunnel between the mucosa and detrusor muscle is short

or absent [5]. Reflux usually is congenital, occurs in families, and affects approximately 1% of children. Reflux predisposes to infection of the kidney by facilitating the transport of bacteria from the bladder to the upper urinary tract. The inflammatory reaction caused by a pyelonephritic infection can result in renal injury or scarring, also termed reflux-related renal injury or reflux nephropathy. In children with a febrile urinary tract infection, those with reflux are 3 times more likely to develop renal injury compared to those without reflux [6]. Extensive renal scarring impairs renal function and can result in renin-mediated hypertension, renal insufficiency or end-stage renal disease, impaired somatic growth, and morbidity during pregnancy [7]. Therefore, aim of this study is evaluation serum vitamin D status in children.

#### MATERIAL AND METHODS:

This was a prospective study of consecutive children with first episode of NS at the time of their diagnosis before treatment with glucocorticoids. The glomerular filtration rate (GFR) was estimated from the Schwartz formula, and only patients with normal values were included. Analysis of 470 children aged from 1-13 years, was performed. Serum concentrations of 1, 25(OH) 2 D3, calcium, phosphorus and creatinine were measured. The correlation of 25OHD3 with RN, seasons, gender and age were analyzed.

#### RESULTS:

A total of 470 children were examined (230 RN and 240 NRN). The deficiency(<10ng/ml) 36 % in RN and 2% NRN (p-value 0.0001), insufficiency(10-30ng/ml) 43% in RN and 5% in NRN (p-value=0.0003), sufficient(30-150ng/ml) 21% in RN and 93% in NRN (p-value=0.002) and potential intoxication (>150ng/ml) 0% in two group of vitamin D were observed in analyzed children with RN. There were no significant differences in serum calcium, phosphorus and gender.

#### DISCUSSION:

In study of Yousefichaijan P, MPC was higher in patients with reflux nephropathy than non-reflux nephropathy patients and MPV was lower in the patients with reflux nephropathy than patients without reflux nephropathy. MPV can be used as an indicator in diagnosis of reflux nephropathy in patients with VUR [8]. Yousefichaijan P found that, sacral ratio abnormality was more common in children with vesicoureteral reflux and reflux nephropathy than children with VUR without reflux nephropathy [9]. In study of Yousefichaijan P, Hyponatremia in children with reflux nephropathy was significantly more common than children without reflux nephropathy. The observed correlation between reflux-related injury and hyponatremia necessitates evaluation of electrolytes in children with pyelonephritis [6]. Yousefichaijan P

found that, the data suggests that prenatal factors may affect the risk of IRN. Adequate prenatal care and good maternal support can be effective in the prevention of reflux-related renal injury [10]. In study of Yousefichaijan P, Results of our study showed that the prevalence of anemia in the Reflux Nephropathy group was not considerably different than that of the control group. We concluded that there isn't a direct correlation between anemia and reflux nephropathy in patients with vesicoureteral reflux [11].

#### CONCLUSIONS:

This study showed that although high rates of vitamin D insufficiency or deficiency were seen among RN patients and NRN participants, Addressing of invalidation experience especially by the patient's spouse is important in management of RN.

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#### CONFLICT OF INTEREST:

We declare that there is no conflict of interest.

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