

Kidney Stones in Epileptic Children Receiving Ketogenic Diet: Frequency and Risk Factors

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BACKGROUND AND PURPOSE:

Although it is an valuable option for children with drug resistant epilepsy, ketogenic diet (KD) therapy is associated with a number of side effects. While gastrointestinal system symptoms (constipation, vomiting, abdominal pain, etc.) and hyperlipidemia are common side effects, renal stones are also seen occasionally. The frequency of kidney stones and risk factors for their development in epileptic children receiving KD is unclear. In this study, we searched the frequency and risk factors for the development of renal stones in children receiving KD therapy.

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METHOD

A total of 95 patients who initiated KD were identified. Seven patients were excluded from the study due to duration of KD less than 12 months. Remaining 88 children were enrolled.

Table.1 Characteristics features of Children With and Without Kidney Stones

	Without kidney stone (n:73)	Kidney stone (n:15)	p-value
Gender, Female, (%)	40(%54,8)	7(%46,7)	0,565
Etiology (Symptomatic)	40(%54,8)	9(%60)	0,712
Age at onset of epilepsy, months; mean ± SD, (median, range)	11,3±19,2	16,1±27,5	0,419
Age at onset of ketogenic diet, months; mean ± SD, range	66,5±47,5	61,1±46,2	0,689
Ambulant, n (%)	45(%61,6)	10(%66,7)	0,714
Number of AEDs at baseline	2,9±1,1	3±1,1	0,89
Number of AEDs at month 12	2,3±1,2	2,4±1,3	0,69
Treatment with Topiramate	23(%31,5)	6(%40)	0,524
Treatment with Zonisamide	6(%8,2)	1(%6,7)	0,659
KD ratio (3:1)	59 (%80,8)	10 (%66,7)	0,066

RESULTS

Renal stones were detected in 15 patients (17%). Twelve of them (73.3%) received potassium citrate treatment. Two (13.3%) patients needed lithotripsy despite receiving potassium citrate treatment, and one of them, who received potassium citrate treatment for five months, developed acute vesicourethral reflux and underwent surgery. No patient discontinued KD due to renal stone development. Serum uric acid concentrations and urine calcium/creatinine ratio did not change significantly over 24 months follow-up period. Age, gender, etiology, age at the seizure onset, duration of KD, mobility status, use of topiramate or zonizamide, and the number of antiepileptic drugs used were not significantly different between patients with and without kidney stones.

CONCULSION

Kidney stone appears a common adverse effect of KD therapy. However, there is no spesific risk factor for kidney stone development in patients receiving KD therapy. Although adequate hydration and potassium citrate treatment is effective in most patients, lythotripsy and surgery may be required in a minority of patients. Considering that KD therapy is a risk factor for kidney stones on its own, and may be detected in asypmtomatic patients, urinalysis and Ca/Cr ratio in spot urine should be measured and serial renal USG should be performed in all patients

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