KSN 2020
FULLY VIRTUAL MEETING

Abstract Type : Oral
Abstract Submission No. : OR-1716

EFFICACY OF CALCITRIOL COMPARING TO ALFACALCIDOL FOR THE TREATMENT OF SECONDARY HYPERPARATHYROIDISM IN CHILDREN ON PERITONEAL DIALYSIS

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Objectives: To compare the efficacy of oral calcitriol and oral alfacalcidol for the treatment of secondary hyperparathyroidism in children on PD.

Methods: Retrospective study on 26 pediatric patients divided into two groups: oral alfacalcidol (n=21) and oral calcitriol (n=5). The following characteristics were analyzed: parathyroid hormone (PTH), total plasma calcium, ionized plasma calcium, plasma phosphorus before treatment, 3 and 6 months after, initial dose and corrected dose of active vitamin D after 3 months. Independent t-test and repeated measures Anova were used for comparison between alfacalcidol and calcitriol groups. The second step was to compare the efficacy of calcitriol in subgroup of patients from alfacalcidol group who were switched to calcitriol later (n=12). To compare data in subgroup between baseline and 3 months after conversion from alfacalcidol to calcitriol we used paired t-test.

Results: After 6 months, there was significant decrease of PTH level 261±259 pmol/L compared with alfacalcidol group 1080±716 pmol/L (P=0.047) and increase in total calcium in calcitriol group 2.46±0.17 mmol/L compared with alfacalcidol group 2.09±0.25mmol/L (P=0.035). The mean dose of calcitriol was also significantly lower as opposed to alfacalcidol dose: 0.04±0.039 µg/kg/week and 0.17±0.076 µg/kg/week respectively (P=0.002) (Table 1).
The mean age of children who were switched from alfacalcidol to calcitriol were significantly different comparing with those who continued alfacalcidol (5±4.6 and 10±4.3 years of age respectively (P=0.022)). 3 months after conversion there was significant increase in ionized calcium level and decrease in PTH level comparing with baseline (Table 2). The dose of alfacalcidol before and dose of calcitriol after switch were differed (0.18±0.1 µg/kg/week and 0.13±0.05 µg/kg/week respectively, P=0.025)

Conclusions: Calcitriol showed superior efficacy for the treatment of secondary hyperparathyroidism in children on PD with the dose 4.25 times lower that of alfacalcidol. Alfacalcidol had limited efficacy for the treatment of secondary hyperparathyroidism in children when prescribed in recommended doses.

Table 1

Table 1. Comparison between alfacalcidol group and calcitriol group

Parameters	Alphacalcidol group (n=21)	Calcitriol group (n=5)	P-value
Age (years)	7.19±5.04	7.6±5.9	0.84
Phosphate before treatment (mmol/L)	2,16±0.56	2.18±0.44	0.961
Total Ca before treatment (mmol/L)	2.03±0.25	2.25±0.07	0.143
Ionized Ca (mmol/L)	1.02±0.18	1.1±0.05	0.305
PTH before treatment (pg/mL)	923±476	708±327	0.353
Dosage of active Vit D at the start (µkg/week)	2.42±1.03	2.09±0.74	0.5
Dosage of active Vit D at the start (µkg /kg/week)	0.157±0.097	0.105±0.039	0.25
Phosphate after 3 months (mmol/L)	2.07±0.51	1.51±0.379	0.034
Total Ca after 3 mo (mmol/L)	2.15±0.23	2.37±0.18	0.081
Ionized Ca after 3 mo (mmol/L)	1.11±0.16	1.22±0.11	0.153
PTH after 3 mo (pg/mL)	869±670	180±168	0.034
Corrected dosage of active Vit D after 3 mo (µkg/week)	2.83±1.03	1.18±1.41	**0.006**
Corrected dosage of active Vit D after 3 mo (µkg /kg/week)	0.17±0.076	0.04±0.039	**0.002**
Phosphate after 6 mo (mmol/L)	2.28±0.58	1.98±0.87	0.578
Total Ca after 6 mo (mmol/L)	2.09±0.25	2.46±0.17	**0.035**
Ionized Ca after 6 mo (mmol/L)	1.086±0.15	1.2±0.1	0.066
PTH after 6 mo (pg/mL)	1080±716	261±259	**0.047**

Table 2

Table 2. Comparison of biochemical parameters and medication profile at baseline and at 3 months after the conversion to oral calcitriol.

Parameter	Baseline (on oral alfacalcidol)	3 months after switch to oral calcitriol	p-value
Phosphate (mmol/L)	2.089±0.681	1.99±0.612	0.498
Total Calcium (mmol/L)	1.99±0.245	2.18±0.33	0.12
Ionized Calcium (mmol/L)	1.07±0.146	1.19±0.11	**0.006**
PTH (pg/mL)	1453±751	626±357	**0.001**
Dose of active Vit D analogue (µkg/week)	2.77±0.9	1.88±0.52	**0.007**
Dose of active Vit D analogue (µkg /kg/week)	0.18±0.1	0.13±0.05	**0.025**