

Dispersion durations of P-wave and QT interval in children treated with ketogenic diet

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Introduction: The ketogenic diet, a high-fat, adequate-protein and low-carbohydrate diet, offers new hope to children with intractable epilepsy. Known adverse effects include anorexia, constipation, renal stones and dyslipidemias. Cardiac complications, including prolongation of the QT interval and sudden cardiac death (SCD) have also been reported in patients treated with ketogenic diet. The association between ketotic conditions and prolonged QTc and/or SCD raises the suggestion of whether ketosis may directly affect cardiac repolarization and be a cause of arrhythmia and/or SCD in diabetic ketoacidosis patients and ketogenic diet patients. There is very limited data for the effects of ketogenic diet on QTD and PWD measures. Therefore we aimed to search for changes in the QTc interval, QTD and PWD with serial electrocardiograms (ECGs) in patients treated with ketogenic diet at our center.

Methods: Twenty-three drug resistant epileptic patients treated with ketogenic diet were enrolled in this study. Electrocardiography was performed in all patients before the beginning and after the sixth month of ketogenic diet. Heart rate, maximum and minimum P-wave duration, P-wave dispersion, maximum and minimum QTc duration and QT dispersion were manually measured from the 12-lead surface ECGs.

All children were started on a standardized 3:1 ketogenic diet with a non-fasting gradual initiation protocol.

Results: A total of 23 patients (13 male and 10 female) with median age of 51 months ranging from 13 to 158 months were included in the study. Electrocardiographic measurements before the beginning of ketogenic diet and after sixth month of treatment are presented in Table 1. Minimum and maximum QTc and QTD measurements showed non-significant increases at 6th month when compared to baseline values. Other previously mentioned ECG parameters showed no significant changes (Table 1).

Conclusion: A six-month long ketogenic diet has no effect on PWD in children with intractable epilepsy. Further studies with larger samples are needed to clarify the effects of ketogenic diet on QTc and QTD.

Table 1. Electrocardiographic measurements of the patients

Variables	Baseline	6 th month	p value
Mean HR, bpm	112 ± 25	115 ± 28	0.521
P max, ms	96 ± 14	95 ± 20	0.768
P min, ms	47 ± 11	46 ± 9	0.716
PWD, ms	48 ± 9	51 ± 12	0.242
QTc max, ms	438 ± 26	455 ± 41	0.053
QTc min, ms	381 ± 20	389 ± 28	0.209
QTD, ms	43 ± 16	47 ± 18	0.382