Incidence of Diurnal QT Concealment in Genotype Positive Long QT 1 and 2 Patients

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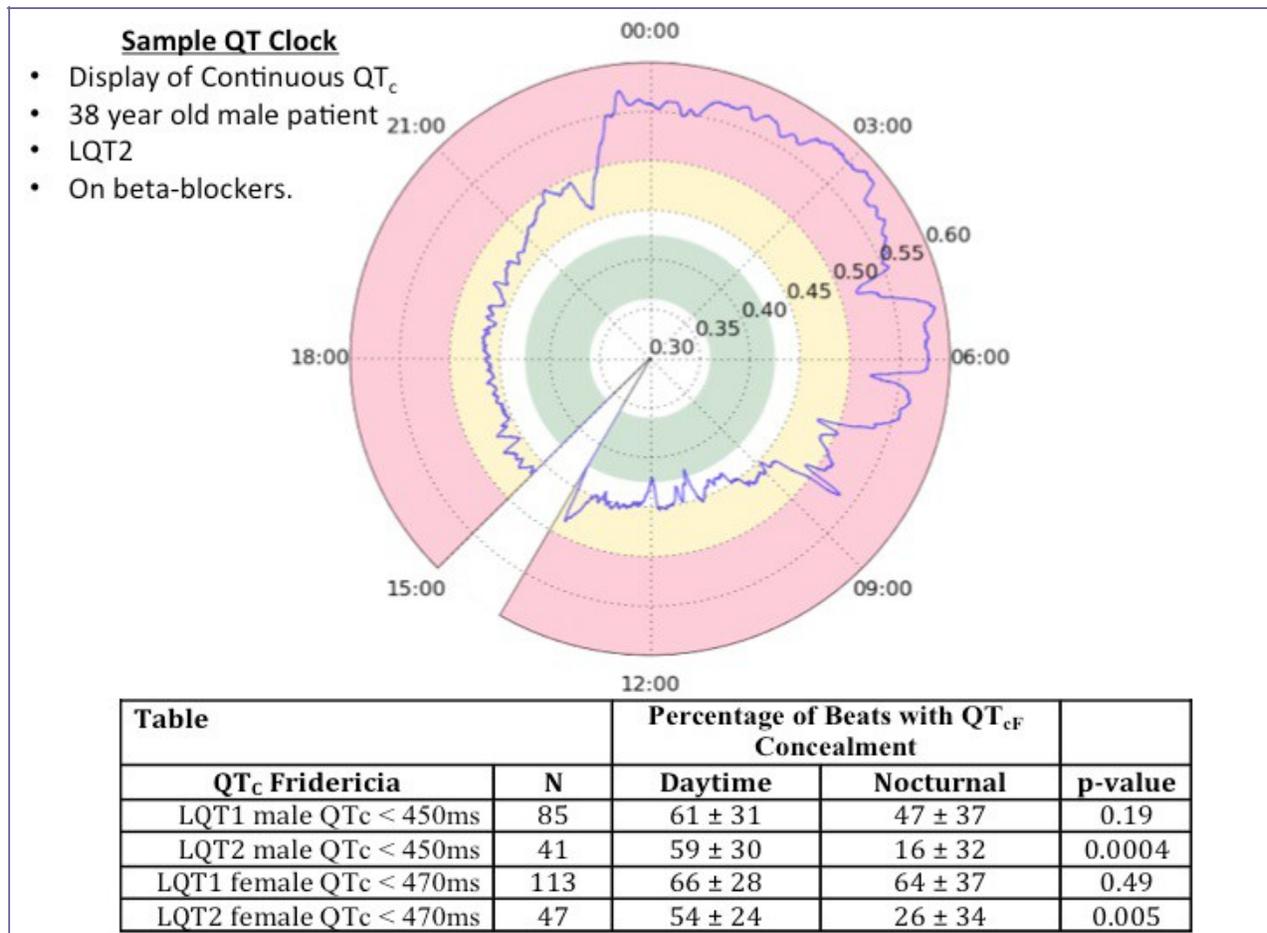
Abstract:

Introduction: Patients with congenital Long QT syndrome (LQTS) are at high risk for sudden death. About 30% of LQTS patients have a concealed form of the syndrome. We used 24 Holter recordings to evaluate dynamic changes in the QTc interval in genotype positive LQT1 and 2 patients.

Methods: We developed a method to automatically measure QTc intervals continuously in 24-hour Holters. The QT intervals were corrected using Bazett's (QTcB) and Fridericia (QTcF) correction formulas. We measured the percentage of beats with QTc below the gender-specific threshold (QTc≤470ms in women and QTc≤ 450ms in men) during the day (9am-4pm) and night (11pm-6am) time. The percentage of beats with QTc concealment was determined.

Results: We analyzed Holters from 198 LQT1 and 88 LQT2 patients. In LQT1 43% and in LQT2 54% were on beta-blockers. In LQT1 male patients QTcB concealment was seen in 36 ± 32% of beats during the day and 48 ± 37% of the beats during the night, p=0.19. LQT2 male patients had 28 ± 29% and 12 ± 29%, of beats with QTcB concealment during the day and night, respectively, p=0.005. In LQT1 female patients, 47 ± 28 and 55 ± 34% of beats showed QTcB day and night concealment respectively, p=0.27. In LQT2 female patients, daytime and nocturnal QTcB concealment was noted in 39 ± 24% and 24 ± 28% of beats, p=0.005. Table shows the percentage of QT concealment using the Fidericia correction formula.

Conclusions: In patients with genotype positive LQTS, significant differences exist in the degree of daytime and nocturnal QTc concealment, especially in patients with LQT2. Holter monitoring in such patients may provide a more accurate assessment of their true burden of QTc prolongation.

Sample QT Clock
- Display of Continuous QT_c
- 38 year old male patient
- LQT2
- On beta-blockers.

Table		Percentage of Beats with QT_{cF} Concealment		
QT_C Fridericia	N	Daytime	Nocturnal	p-value
LQT1 male QTc < 450ms	85	61 ± 31	47 ± 37	0.19
LQT2 male QTc < 450ms	41	59 ± 30	16 ± 32	0.0004
LQT1 female QTc < 470ms	113	66 ± 28	64 ± 37	0.49
LQT2 female QTc < 470ms	47	54 ± 24	26 ± 34	0.005