Is there a QTc interval prolongation in girls and women with Turner syndrome?

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Introduction

- Turner syndrome (TS) is caused by absence of a sex chromosome or abnormalities of the X chromosome.
- It is reported to be associated with electrocardiogram (ECG) abnormalities, such as QTc prolongation.[1]

Objectives

1. **What is the prevalence of QTc prolongation in patients with TS?**
2. **Is QTc prolongation more prevalent in patients with monosomy 45,X compared to other karyotypes?**

Methods

QT intervals of computerized and printed 12-leaded ECGs were measured manually.

Correction of QTc interval:
1. Bazett: QTc = QT / √ RR
2. Hodge: QTc = QT + 1.75 (heart rate – 60)

Baseline characteristics	
Number of patients	350 (125 girls, 225 women)
Median age (min/max) in years	23 (1-65)
Karyotype: n (%)	
• **Monosomy 45,X**	116 (34%)
• **Other**	229 (66%)
BAV n(%)	76 (22%)
COA n(%)	18 (5%)
Hypertension n(%)	46 (13%)

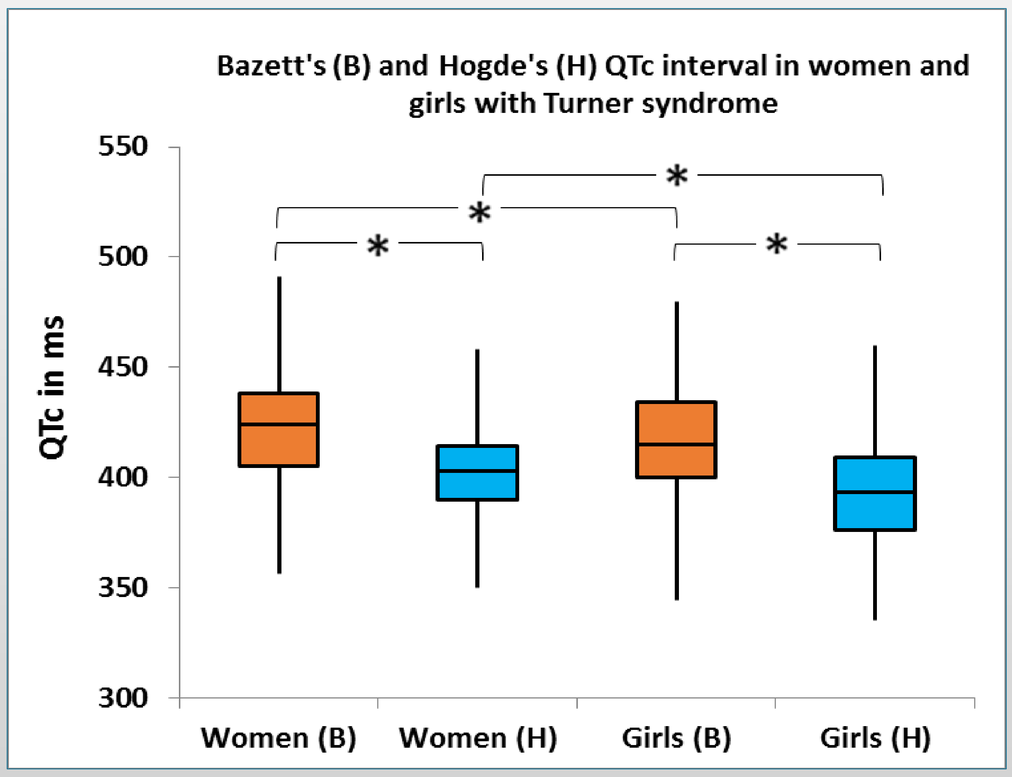
BAV = bicuspid aortic valve, COA = coarctation of the aorta

Karyotype was divided into two groups:
1. Monosomy 45,X
2. Other karyotypes

Prolonged QTc
1. >450 ms for girls[2]
2. >460 ms for women[3]

Prevalence of QTc prolongation was compared to the reported prevalence of the general population in literature.

Results



QTc interval in patients with TS	Total population N=350	45,X monosomy N = 116#	Other karyotypes N = 229#	P-value
Heart rate (bpm)	85 ± 18	89 ± 18	83 ± 18	*0.002**
QT interval (ms)	356 ± 33	352 ± 34	358 ± 32	*0.07*
QTc Bazett, bQTc (ms)	420 ± 25	423 ± 26	418 ± 24	*0.111*
Prolonged bQTc n(%)	19 (5%)	7 (6%)	11 (5%)	*0.647*
QTc Hodge, hQTc (ms)	400 ± 20	402 ± 19	398 ± 20	*0.084*
Prolonged hQTc n(%)	1 (0%)	0 (0%)	1 (0%)	*0.473*

Values are expressed as mean ± SD. Differences between the 45,X and 'other karyotype' group were tested with T-tests and Chi-square tests.*Statistically significant difference between 45,X and 'other karyotype' group. #Five patients with 'not to classify' karyotype were excluded from karyotype analysis.

Conclusions

- **The QTc interval in a large cohort of girls and women with TS is not prolonged compared to the general population using both Bazett's and Hodge's formulas, in contrast to what other studies have stated in small cohorts.**
- **Patients with monosomy 45,X show no clinically relevant difference in QTc interval nor prevalence of QTc prolongation compared to other karyotypes.**

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