Demographic and Clinical Characteristics of Genetic Variants (KCNQ1, KCNH2, SCN5A, KCNE1, KCNJ2) of Long QT Syndrome and Vulnerability to QTc Prolongation With Psychotropics: A Case Report and Systematic Review of the Literature

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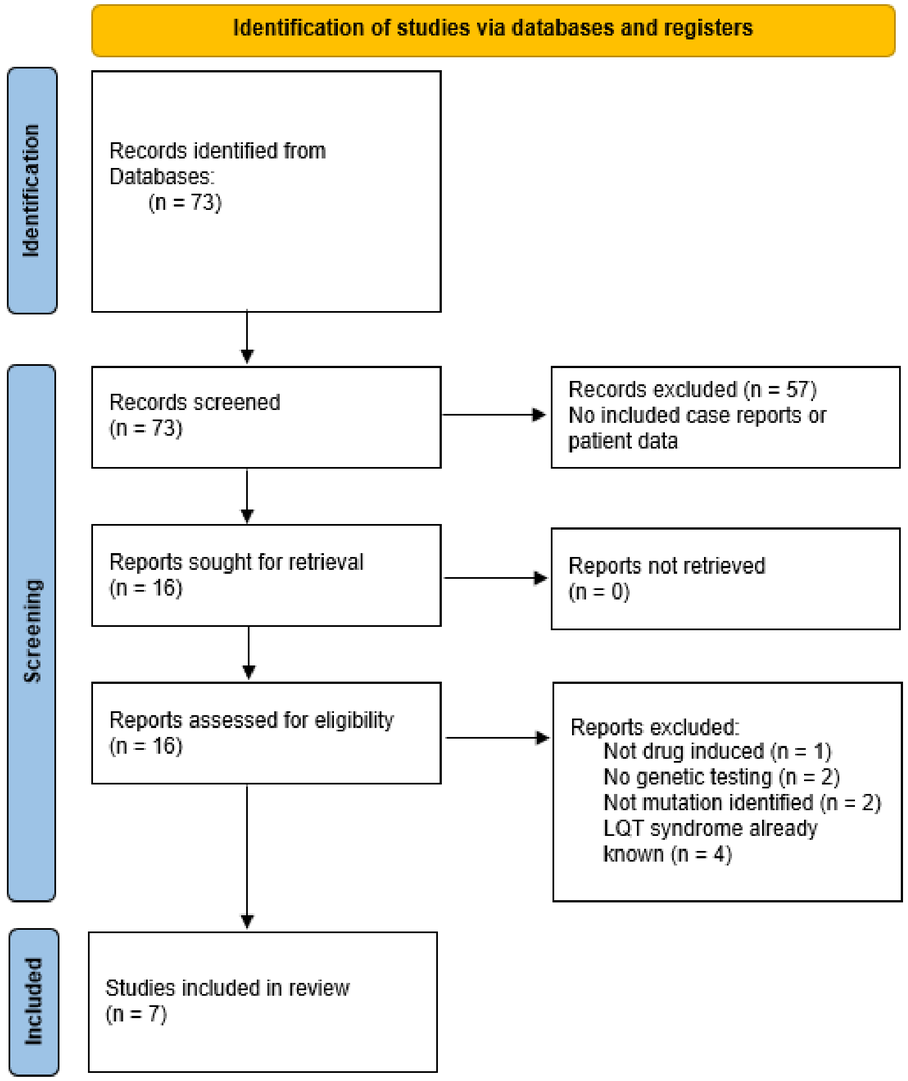
BACKGROUND

- CL psychiatrists often assess the risk-benefit of psychotropics related to QTc prolongation.
- Underlying genetic syndromes impart vulnerabilities to QT-prolonging drugs.

PRISMA FLOW DIAGRAM



Year and Author	Age/ Gender/ Sxs	Mutation/ Syndrome	EKG Findings	Inciting Agent
2010 McKechnie	11F; elective surgery	Genetic testing performed, No mutation report	Max QTc: 590 pVT Last QTc: 490	ondansetron
2014 Kumar	21F; presyncope	KCNH2/ LQT2	Max QTc: 616 T wave notching, VF Last QTc: 380	crystal meth
2014 Singh	15F; lethargy, dizziness	KCNQ1/ LQT1	Max QTc: 521 TdP Last QTc: 465	escitalopram
2015 Issa	24F; difficulty breathing	KCNH2/ LQT2	Max QTc: 771 pVT and TdP Last QTc: 550	levetiracetam
2017 Blusztein	36F; confusion, incoherent speech	KCNH2/ LQT2	Max QTc: 540 afib, sinus brady, pVT Last QTc: 500	domperidone
2018 Marstrand	54F; syncope	KCNE1/ LQT5	Max QTc: 640 TdP Last QTc: 460	citalopram
2020 Kambayashi	57F; insomnia, nocturnal delirium	SCN5A/ LQT3	Max QTc: 560 TdP Last QTc: 470	blonanserin
2024 Dang	67F; no sxs	KCNE1/ LQT5	Max QTc: 624 NSR Last QTc: 503	citalopram

Key: afib = atrial fibrillation; BB = beta-blocker; ICD = implantable cardioverter-defibrillator; NSR = normal sinus rhythm; pVT = polymoprhic ventricular tachycardia; sinus brady = sinus bradycardia; sxs = symptoms; TdP = torsades de pointes; txt = treatment; VF = ventricular flutter

RESULTS

- Most Common:
  - Inciting drug classes: SSRIs (3 cases) and antiemetics (2 cases)
  - Variant: KCNH2 (3 cases), followed by KCNE1 (2 cases); single cases of SCN5A and KCNQ1
  - Treatment: BB (4 cases), ICD (3 cases)

REFERENCES

SCAN ME

CASE REPORT

- We present case of a 67 y/o woman w/ MDD on citalopram presenting for transplant eval.
- QTc was 624 ms. After citalopram DC'd, QTc decreased (520 ms). Sertraline was started; QTc was 503 ms two weeks later.
- Genetic testing: Heterozygous mutation in KCNE1 gene (variant occurs at 0.81% in the general population +increases risk for QTc prolongation w/ external factors).

DISCUSSION

- There was a discordance between the prevalence of LQTS in the population versus which syndromes were identified in this small sample size.
- The most common long QT syndromes (LQT1, 40%-55% prevalence; LQT2, 30%-45% prevalence) comprised 4 cases and represented the youngest patients.
- The lesser common long QT syndromes (LQT3, 5%-10% prevalence; LQT5, <1% prevalence) were observed in 3 cases and represented the oldest patients.

CONCLUSIONS

- First presentations of LQTS unmasked by QT prolonging drugs may involve less common mutations, particularly in older women.
- For child and adolescent psychiatrists, drug-induced prolonged QT may be associated with the more common LQT syndromes.
- Further research into treatment for individuals with less common LQT syndromes may help guide risk-benefit ratio when QT prolonging drugs are unavoidable.