A case study on escitalopram induced QTc prolongation and adverse drug reaction

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ABSTRACT
Antagonistic medication response (ADR) can be characterized as any toxic change which is suspected to be because of a medication, happens at dosages ordinarily utilized in man, requires treatment or decline in portion or shows alert later on the utilization of similar medication. Escitalopram is a medication which goes under the classification of particular serotonin reuptake inhibitors (SSRIs) (antidepressants). It is the S-enantiomer of the racemic subsidiary of citalopram, which specifically restrains the reuptake of serotonin with practically no impact on norepinephrine or dopamine reuptake. Practically all the antidepressants and antipsychotics have been connected to QT prolongation. In a patient with previously diagnosed congenital QTS, we present a drug-induced QT extension owing to the escitalopram overdose. A 15-year-old Caucasian woman was presented with an escalopram overdose after a suicide attempt. The patient has a lengthy QT period of torsade de point incidents. The patient was received and monitored in the telemetry facility. She proceeded to exhibit the persistently extended QT period after the resolution of torsades de punes. She was diagnosed with a congenital QT condition by the cardiology clinic. In this situation, an escitalopram overdose is seen to trigger an immediate QT extension for a patient who has congenital LQTS and the value of an electrocardiogram before SSRIs are started, particularly for those at high risk of QT prolongation.

INTRODUCTION
Unfavorable medication response (ADR) can be characterized as any poisonous change which is suspected to be because of a medication, happens at dosages ordinarily utilized in man, requires treatment or decline in portion or demonstrates alert later on the utilization of a similar medication.

A QT intermission or QTC is an electrocardiographic amount of ventricular repolarization and depolarization. (Singh and Maldonado-Duran, 2014) The usual value of QT intermission is below 450ms in men and 460ms in women. (Schwartz et al., 2009) Antiarrhythmics, antibiotics, antipsychotics, antide-
pressants are some of the medications/drugs can lead to prolonged QT interval. (Bazett, 1920)

There are some hazard issues for QT continuation are feminine sex, age superior than 65year, electrolyte conflicts (hypokalemia, hypomagnesemia) attendant QT-prolonging medicines. (Bhuiyan et al., 2013)

The United States Food and Drug Administration (FDA) ICH E14 leadership for scientific assessment of QT/QTc intermission continuation and pro-arrhythmic possible for non-arrhythmic drugs recognized the threshold is in Column 1 In Table 1.

Table 1: US FDA E14 supervision for drug-induced QTc maintenance

| Change from baseline QTc  | Interpretation         |
|---------------------------|------------------------|
| placebo correct           |                        |
| <10 ms                    | Low concern            |
| 10-20ms, QTc outliers + clinical AES | Increasing concern |
| >20ms, +QTc outliers -- clinical AES | Definite concern |

QTc outliers: individual-level QTc > 500ms or change in QTc>60ms. Clinical AEs (Adverse Events): TdP, unexpected death, ventricular tachycardia, ventricular fibrillation or flutter, syncopation, appropriation. AE: TdP, torsades de pointes; US FDA; US Food and Drug Administration (Kanjanauthai et al., 2008). The study conducted in the Unites States from 2011 – 2014 reported that the prevalence of QTc prolongation in adults on antidepressant therapy is 1% above in 60years or more of age.

Escitalopram is a drug which originates below the group of discriminating serotonin reuptake inhibitors (SSRIs) (antidepressants). It is the S-enantiomer of the racemic copied of citalopram, that selectively constrains the reuptake of serotonin by little to no result on norepinephrine or dopamine reuptake. Escitalopram is metabolized by hepatic metabolism via CYP2C19 and CYP3A4 to S-desmethyl citalopram (S-DCT). S-DCT is absorbed to S-di- desmethyl citalopram (S-DDCT) via CYP2D6 (Funk and Bostwick, 2013).

There are some monitoring parameters to check if a patient is on escitalopram, including QTc changes, electrolyte, liver and renal function tests. Prolonged QT interval on ECG is reported in several studies as an adverse drug reaction. (Chatfield, 2015)

Situation Account

A 68-year-old feminine patient is acknowledged for the diagnosis of osteoporotic fracture with cord compression in Figure 1. She was a known case of hypertension and on medication T.Amlong 10mg for the past 3 years (Camm et al., 2012). She was admitted under the department of neurosurgery in a quaternary care hospital. She was treated with calcium and phosphorus with vitamin D chewable tablets once daily, Teriparatide 20mg once daily, Inj.paracetamol 1gm thrice daily after the fixation surgery (Beach et al., 2014). The patient showed signs of depression and was advised to take Tab. Escitalopram 10mg from the second day of admission. Electrolyte disturbances were seen, a mainly hypokalemic pattern was shown in the ECG (Chapel et al., 2011).

Figure 1: ECG report before escitalopram treatment

The ECG report shows a QTc interval of 454ms on the first day. After the escitalopram treatment was initiated, the patient showed a QTc interval of 505ms in Figure 2. The potassium level was found to be 2.8mg/dl on the first day (hypokalemia), along with QTc prolongation, which was treated with syrup potassium chloride 15ml thrice daily and serum potassium level increased to 3.4mg/dl. (Noord et al., 2009)

Figure 2: ECG report after escitalopram treatment

DISCUSSION

Unhappiness is presently one of the wildest increasing diagnosis completed by the physicians throughout the previous 5 years, and hence this is an
increasing trend in the operation of escitalopram. Three cases of QTc prolongation with escitalopram was reported. (Dietle, 2015; Harrigan et al., 2004) The drug-prompted QT prolongation is believed to be brought about by the restraint of deferred potassium rectifier current IKr (fast) by explicit medications. IKr is an outward current constrained by the potassium divert that is dependable partially for the repolarization of ventricular myocytes. At the point when a medication meddles with this current, it along these lines upsets repolarization, and thus the QT stretch is delayed. (Hasnain et al., 2014; Potkin et al., 2013)

CONCLUSIONS

Practically all the antidepressants and antipsychotics have been connected to QT prolongation. The basic meds that are considered to have high danger are Selective serotonin reuptake inhibitors primarily escitalopram. New examinations on this point are relied upon to develop inferable from the FDA's prerequisite to explore the heart profiles of the medication.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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