Long QT interval induced by clindamycin

P B Maduranga[1], K C Chathurangani[1], C J Dharmaratne[1], U D De Silva[1], S Amarasinghe[1]

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Introduction

QT prolongation can lead to torsades de pointes and life threatening complications such as ventricular tachycardia and ventricular fibrillation. Normal QT interval depends on age and sex. Usually QT interval is longer in femalesand in older persons. On average QT interval of 450 ms for males and 470 ms for females is considered normal [1]. Prolonged QT interval can be genetic or acquired. Acquired long QT_c occurs due to many causes such as drugs (class I A and class III anti arrhythmic drugs, antipsychotics, antibiotics), hypokalaemia, hypomagnesaemia, hypocalcaemia and heart disease [2,4]. Prescribers should be aware of drugs that could cause QT prolongation. Although several antibiotics are known to cause long QT_c, there is little evidence that clindamycin causes torsades de pointes by causing QT prolongation [3, 4].

Case report

An 83 year old female patient with chronic stage 3a kidney disease, stable renal function and normal urine output, without proteinuria who was on calcium and vitamin D supplementation presented with a two weeks history of right knee joint pain, swelling and restricted movements. She did not have a history of cardiac symptoms or family history of sudden cardiac death. She was not on any QT prolonging drugs.

Patient was diagnosed with septic arthritis of the knee joint. She was started on IV clindamycin 300 mg 6 hourly and IV flucloxacillin 500 mg 6 hourly. ECG on admission was in normal sinus rhythm with normal QT interval (QT_c 388 msec). Serum potassium, calcium and magnesium were normal throughout hospital stay. The initial period after admission was uncomplicated. On day fourteen of intravenous clindamycin treatment patient suddenly developed episodes of generalized tonic seizures with sweating which lasted less than one minute. Patient was put on continuous cardiac monitoring which revealed torsades de pointes with absent carotid pulse. Patient was defibrillated (Figure 1) followed by IV $MgSO_4$ infusion and rhythm reverted to sinus rhythm.

Later a 12 lead ECG was done for further evaluation and it revealed prolongation of corrected QT interval (QT_c 671 msecs).

We looked for the aetiology for the torsades de pointes and prolonged QT interval and the most possible cause according to literature was clindamycin. Clindamycin was withheld while continuing all other drugs and twice daily QT interval calculation was done. The QT interval gradually reduced (Table 1).

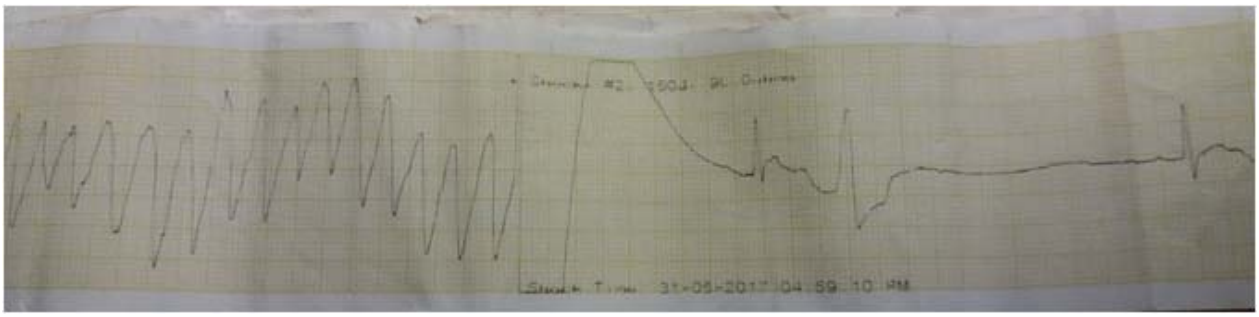

Figure 1. **Polymorphic pulseless VT reverted by DC shock.**

[1]*Teaching Hospital Karapitiya, Sri Lanka.*

Correspondence: PBM, *e-mail: <bhathiyamg@gmail.com>.* *Received 17 January 2018 and revised version accepted 14 February 2018.*

Table 1. Change in QT_c while on clindamycin and after omitting it

Timing of the ECG	*Actual QT interval (msecs)*	*Corrected QT interval (msecs)*
Patient's normal ECG	320	388
15 days of antibiotics (Day of torsa de pointes)	600	671
3 days after omitting clindamycin	440	475
7 days after omitting clindamycin	400	447
15 days after omitting clindamycin	400	383

Patient was discharged without any residual complications and the ECG showed a normal QT interval. Further follow up of the patient did not reveal any similar episodes. Relatives were requested to undergo screening for subclinical long QT syndrome.

Discussion

This patient developed QT prolongation fourteen days after the commencement of clindamycin. She had a number of factors making her liable to clindamycin induced QT prolongation and its consequences such as female gender, old age and chronic kidney disease [1]. Even though there was no family history, it is possible that this patient had subclinical long QT syndrome with normal ECG making her liable for this reaction.

Clindamycin induced LQTS is an idiosyncratic reaction (type B) and is therefore unpredictable. Clindamycin has a short half-life (2-3 hours), is metabolized in the liver and the kidney plays a minor role excreting 10% of the active drug in urine slowly over many days. Severe renal failure results in prolongation of half-life [5]. This patient was in CKD stage 3a with a eGFR of > 45 ml/min with preserved urine output and absent urinary albumin levels. Thus she was in mild to moderately reduced renal function category rather than severe CKD according to KDIGO 2012 classification.

Causality was assessed according to Naranjo causality assessment tool (NCAT) and she obtained 7 points [6]. This causality assessment tool gives two points if the drug is reintroduced and the patient develops the reaction again. In this patient reintroduction of the drug was not an option since it was a life threatening reaction. NCAT score of 5-8 indicates a probable association while a score of ≥ 9 indicates a definite reaction. In this patient a score of 7 obtained without reintroduction of the drug makes it a probable reaction.

Conclusion

Though clindamycin induced QT prolongation is rarely reported, in the presence of other risk factors and in patients with family history of long QT it is prudent to start the drug cautiously and carry out ECG monitoring. Unless essential it is best to avoid the medication in high risk patients.

Conflicts of interest

There are no conflicts of interest.

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