

QRS AND QTc ELECTROCARDIOGRAM (ECG) DURATIONS IN PATIENTS PRESENTING WITH ACUTE TOXICITY RELATED TO EITHER SELF-REPORTED SIMULTANEOUS COCAINE-ETHANOL USE OR SELF-REPORTED LONE COCAINE USE.

David M Wood (1,2), Shaun L Greene (1), Paul I Dargan (1,2). 1. Clinical Toxicology, Guy's and Thomas' NHS Foundation Trust, London, UK; 2. King's Health Partners, London, UK.

Introduction: QRS and QTc prolongation, and associated cardiac arrhythmias, following cocaine use are due to cocaine-related cardiac ion channel dysfunction. The simultaneous use of cocaine and ethanol leads to an increased production of the cocaethylene metabolite, which has greater binding to cardiac ion channels and potentially therefore greater risk of cardiac arrhythmias. The effects of simultaneous cocaine-ethanol use on the QRS and QTc duration compared to those seen with lone cocaine use have not been reported.

Methods: A 24 month retrospective review of patients with acute toxicity related to self-reported lone cocaine or simultaneous cocaine-ethanol use was undertaken. Data on the sex, presenting symptoms/signs and physiological parameters were extracted on these presentations. ECGs were reviewed for all presentations, where available, and QRS duration and QTc calculated using Bazett's formula were extracted. Comparison of the QRS and QTc durations was undertaken between the two groups.

Results: There were 48 and 31 presentations with acute toxicity related to self-reported simultaneous cocaine-ethanol use and self-reported lone cocaine use respectively. There was no significant difference in the mean (SD) age of those with simultaneous cocaine-ethanol use (29.8 ± 10.2 years) compared to those with lone cocaine use (29.3 ± 7.7 years) ($p=0.80$). There were no significant differences between the mean (SD) heart rate ($p=0.90$), systolic blood pressure ($p=0.81$) and temperature ($p=0.61$) in the simultaneous cocaine-ethanol and lone cocaine use groups. The mean (SD) QRS and QTc durations were 87.3 ± 10.8 msec (range 60–108) and 397.4 ± 32.0 msec (range 323–484) for the simultaneous cocaine-ethanol use and 86.9 ± 12.5 msec (range 67–126) and 396.2 ± 34.6 msec (317–488) for lone cocaine use groups ($p=0.87$ and $p=0.88$ respectively). There were no QTc or QRS related cardiac arrhythmias in either group.

Conclusions: In this study, we have not detected a significant difference in the QRS and QTc durations between those self-reported simultaneous cocaine-ethanol use compared to those with lone cocaine use. Further studies are needed correlate the concentrations of cocaine and its metabolites, including cocaethylene, to confirm the findings seen in vitro and animal models of cardiac ion channel dysfunction.