INTRODUCTION

- Recreational drug use is common in the UK, particularly amongst clubbers and others within the night-time economy.
- The British Crime Survey of 2010/2011 estimated that 8.8% of the adult population had used illicit drugs in the last year.
- An on-line survey, conducted over the same period by the dance magazine MixMag, showed significantly higher use in the population who frequent the night-time economy reporting that 50-75% of clubbers had used MDMA (Ecstasy), cocaine or mephedrone over the previous year.
- In a more recent survey of attendees at a London nightclub, 41% of those surveyed claimed to have used mephedrone over the last month.
- In a study designed to assess the feasibility of using pooled urines to confirm what drugs are currently being used, a series of samples were collected using an adapted portable urinal at a London nightclub.
- Samples were analysed using a variety of analytical techniques; this paper presents the results of screening using a method based on UPLC in combination with TOF-MS².

METHODS

Sampling site and urine collection

Setting: A large south London nightclub catering predominantly for men who have sex with men (MSM; ‘gay’) in July 2011. Urinal: A portable standalone four-person urinal, use was voluntary and anonymous—other standard toilets were also available within the club.

Samples: Pooled urinal samples were collected from the urinal (using a manual vacuum pump) during two club promotions:
- Event 1: Friday/Saturday (11 pm - 4 am)
  Collection times: 2 am (sample #1), 3 am (sample #2) and 4 am (sample #3)
- Event 2: Saturday/Sunday (11 pm - 10 am)
  Collection time: 10 am (sample #4).

Sample preparation: Dilution 5-fold with mobile phase.

Instrumentation

Waters® ACQUITY UPLC® System in combination with the XEVO G2 QTOF in MSE mode; this involves the rapid alternation between low and high-energy conditions (Waters). Data shows analysis of a 4-Fluoroamphetamine (4-FA) reference standard for appending to database. Relative mass error for 4-FA was 10 ppm. Data were matched to a database comprising 950 drugs and metabolites. All substances have an associated RT, >65% of entries have additional fragment ions. Substance identification is thus based on retention time and an exact mass ‘fingerprint’ for each analyte, the latter comprising exact mass of the precursor ion and up to four fragment ions.

RESULTS AND DISCUSSION

Data was collected using a Waters XEVO G2 QTOF in M$^+$ mode; this involves the rapid alternation between two functions and provides the exact mass of the parent ion in addition to fragment ions for additional confirmatory purposes. Acquired data were compared to a comprehensive database, prepared under the same conditions, containing 950 drugs and metabolites. All substances have an associated RT, >65% of entries have additional fragment ions. Substance identification is thus based on retention time and an exact mass ‘fingerprint’ for each analyte, the latter comprising exact mass of the precursor ion and up to four fragment ions.

Pooled urine analysis

A total of 72 parent drugs and their metabolites were detected in the four samples. Detected drugs could be broadly divided into the following categories: