Evaluation of Latent Fingerprints for drug screening in a social care setting

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BACKGROUND

- Sweat in latent fingerprints (LFPs) deposits have shown to contain illicit drugs and their metabolites¹
- Quantitative mass spectrometry techniques paired with qualitative point-of-care tests (POCT) have been utilised to detect cocaine, opiates and amphetamines²
- POCT require minimum sample preparation allowing a rapid turnaround time³
- This pilot study trialled a POCT utilising LFPs in a social care setting, where quick and confidential screening tests are required

METHODS

Samples collected:
1) 1 natural LFP → screened for Amphetamine, Opiates and Cocaine via Intelligent Fingerprinting screening test
2) 1 mL of Oral Fluid (OF) via Quantsal kit

10 mins run-time

OF and LFP confirmation samples analysed by UPLC-MS/MS at LGC
10 groomed LFP collected on confirmation cartridge

• Both screening and confirmation cartridge were from Intelligent Fingerprinting (DOA114 and DOA150)

RESULTS: Screening tests

- Out of 131 tests, 13% were ad-hoc testing

RESULTS: Confirmation

Table 1 - Drug and metabolite concentrations in 10 LFP confirmation samples analysed via UPLC-MS/MS (n = 32).

<table>
<thead>
<tr>
<th>Drug/metabolite</th>
<th>No. of samples</th>
<th>Median quantity (pg/µL)</th>
<th>Quantity range (pg/µL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzoylecgonine</td>
<td>22</td>
<td>90</td>
<td>11 - 1485</td>
</tr>
<tr>
<td>Cocaine</td>
<td>22</td>
<td>1400</td>
<td>177 – 6260</td>
</tr>
<tr>
<td>Morphine</td>
<td>3</td>
<td>139</td>
<td>35 – 177</td>
</tr>
<tr>
<td>6-MAM</td>
<td>5</td>
<td>194</td>
<td>48 – 1524</td>
</tr>
<tr>
<td>Codeine</td>
<td>2</td>
<td>222</td>
<td>38 – 406</td>
</tr>
</tbody>
</table>

Table 2 - Drug and metabolite concentrations in OF confirmation samples analysed via UPLC-MS/MS (n = 130).

<table>
<thead>
<tr>
<th>Drug/metabolite</th>
<th>No. of samples</th>
<th>Median concentration (ng/mL)</th>
<th>Concentration range (ng/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benzoylecgonine</td>
<td>5</td>
<td>18</td>
<td>8 – 50</td>
</tr>
<tr>
<td>Cocaine</td>
<td>12</td>
<td>14.5</td>
<td>8 – 207</td>
</tr>
<tr>
<td>6-MAM</td>
<td>6</td>
<td>2.5</td>
<td>2.5 – 49</td>
</tr>
<tr>
<td>Dihydrocodeine</td>
<td>1</td>
<td>83</td>
<td>83</td>
</tr>
<tr>
<td>Codeine</td>
<td>4</td>
<td>65</td>
<td>26 – 652</td>
</tr>
<tr>
<td>THC</td>
<td>19</td>
<td>26</td>
<td>2 – 150</td>
</tr>
<tr>
<td>Negative</td>
<td></td>
<td>89</td>
<td></td>
</tr>
</tbody>
</table>

RESULTS: Demographics

- 36 subjects were tested:
  - 53% female
  - Mean age 36 ± 11 years (range 17 – 36 years)
  - Main ethnicity was white (61%)
  - Alcohol and illicit drug use:
    - Two-thirds smoked, of which 21% smoked <5 a day
    - 39% of subjects stated alcohol consumption (14% drink > 10 units)
  - Cocaine was the most frequently used drug in the last month (14%) followed by cannabis (11%)

CONCLUSIONS

- Overall, the LFP POCT successfully detected cocaine and opiates in a social care setting
- Cocaine was the most dominant analyte in LFP screening test and both confirmation samples
- Additionally, THC was observed in OF
- Factors affecting results included: drug’s physicochemical properties, time of drug administration and the dose consumed

The authors declare that there is no conflict of interest