

## Usefulness of urinary nicotine metabolite levels to estimate smoking frequency

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### Objectives

Nicotine (NIC) is metabolised to cotinine (COT) and further to trans-3'-hydroxycotinine (HCOT) by the CYP P450 2A6 enzyme. The ratio of HCOT to COT is an index of CYP2A6 activity, thus a marker of nicotine metabolism rate. Evidence shows that this ratio could predict responses to smoking cessation medication and guide pharmacotherapy. Since literature on the association between this ratio and cigarettes smoked Per Day (CPD) or nicotine dependence is conflicting, our aim was to investigate these relationships using urine samples from daily smokers. We also wanted to assess the usefulness of urinary nicotine metabolites to estimate smoking frequency.

### Design

Urine samples from 87 smokers aged 19-59 years were collected in three Belgian hospitals. Concentrations of NIC, COT and HCOT were determined by on-line Solid Phase Extraction (SPE) combined with Ultra Performance Liquid Chromatography (UPLC) coupled to tandem mass spectrometry (MS/MS). The amount of CPD, time to the last smoked cigarette (TTLC) and Fagerström score for nicotine dependence were obtained by questionnaires.

### Main results and conclusions

CPD were significantly correlated with urinary NIC, COT and HCOT levels and COT levels correlated with HCOT levels. The TTLC was inversely correlated with NIC, COT and HCOT but positively correlated with COT/NIC. HCOT/COT was not significantly correlated with CPD nor with Fagerström score.

Urinary levels of NIC, COT and HCOT (but not HCOT/NIC ratio) were thus useful to characterise smoking frequency of active smokers taking into account that the time to the last smoked cigarette influences these nicotine metabolite levels.

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