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A comparative study of screening instruments and biomarkers for the detection of cannabis use.

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Abstract

BACKGROUND: The aim of this study was to compare the usefulness of three different screening instruments (questionnaires) for the detection of cannabis use (CU) with biological markers in blood and hair.

METHODS: Ninety-four students were recruited in October 2013. Participants filled out the Severity of Dependence Scale (SDS), the CAGE-AID and ProbCannabis-DT questionnaires concerning their possible CU. Blood and hair samples were taken and analyzed by gas chromatography-mass spectrometry. Logistic regression (Nagelkerke R^2) and Receiver Operating Characteristic (ROC) curve analyses were performed. THCCOOH plasma of ≥ 5 ng/mL and THC hair concentrations of ≥ 0.1 and ≥ 0.02 ng/mg were used as gold standard for CU. The questionnaire results were compared to different concentration ranges for THCCOOH in plasma (< 5 , 5-75 and > 75 ng/mL, indicating the intensity of use) and THC in hair (≥ 0.02 ng/mg, ≥ 0.1 ng/mg).

RESULTS: The Nagelkerke R^2 for comparing the SDS, CAGE-AID and ProbCannabis-DT, to THCCOOH in plasma was 0.350, 0.489 and 0.335 respectively. The area under the ROC curve (95% confidence interval) was 0.772 (0.662-0.882), 0.797 (0.710-0.884) and 0.769 (0.669-0.870) respectively. Corresponding sensitivity/specificity were: 70%/84%, 100%/59% and 87%/67% respectively. These values were similar to those compared to a 0.02 ng/mg THC cut-off in hair.

CONCLUSIONS: Moderate agreement was found between all questionnaires and biomarkers of CU. The CAGE-AID and probCannabis-DT questionnaires were very sensitive, but less specific. SDS was less sensitive, but more specific.

KEYWORDS: CAGE-AID; ProbCannabis-DT questionnaire; SDS; cannabis use; sensitivity; specificity

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