

URINARY COTININE TO ASSESS EXPOSURE TO ENVIRONMENTAL TOBACCO SMOKE

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Background and Aims: Tobacco smoke is a major source of exposure to thousands of chemicals and may represent a relevant confounder in biomonitoring studies aimed to assess exposure to environmental pollutants. In this study we compared urinary cotinine and self-administered questionnaire to investigate tobacco smoke habit and environmental tobacco smoke (ETS).

Methods: One hundred and sixty eight working individuals of a medium size city of Northern Italy entered the study. A self-administered questionnaire was used to evaluate tobacco smoke exposure. Urinary cotinine was measured by LC/MS/MS.

Results: Based on questionnaire 21% of the investigated subjects classified themselves as active smokers, 32% as ex-smokers and 47% as never smokers (total 79% present non-smokers); additionally 13% of subjects declared to be ETS exposed (6% active smokers).

Considering urinary cotinine as a gold standard, subjects were re-classified using a cut-off value of 50 µg/l: on this base 20% and 80% of individuals were identified as true smokers (S) and true non-smokers (NS), respectively. On this base 1.2% of subjects self-classified as never or ex-smokers were identified as S. The false self-classification was confirmed after further interview.

Among NS a further classification in subjects with and without ETS exposure was attempted (yesETS and noETS). Based on questionnaire 69% of subjects declared to be noETS, while 11% yesETS. with median urinary cotinine (5th-95th percentile) of 0.5 (0.2-2.0) µg/l and 1.3 (0.2-38.4) µg/l. Possible cotinine cut-off values to classify ETS exposure of 1.0, 1.5 and 2.0 µg/l were evaluated. In all cases higher specificity than sensitivity was found, with values ranging from 0.83 to 0.95, and from 0.56 to 0.37, respectively.

Conclusions: Our study confirms urinary cotinine as a good biomarker of tobacco smoke exposure, and the cut-off of 50 µg/l appropriate to classify active smokers; the classification of ETS exposure is critical, and needs further investigation.