



## Krytyczna ocena wartości dopuszczalnych stężeń morfiny w moczu w badaniach medycznych i antydopingowych

Critical assessment of threshold limits of morphine concentration in the urine in medical and anti-doping screening

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**Abstract – Introduction.** On the basis of morphine concentrations in urine, established as maximum permissible values in medical (300 ng/ml) and anti-doping (1000 ng/ml) examinations, it cannot be univocally assessed if we deal with doping or substance dependence. The consumption of poppy products and drugs may influence on positive results of anti-doping controls and other narcotic tests.

**Methods.** This problem is exemplified by six volunteers, who consumed poppy seeds (100 g), filling of poppy seed (150 g) and anti-cough tablets containing codeine (30 mg of codeine). Each volunteer collected urine sample in 0, 2, 4, 6, 10, 18 hours since intake. The urine concentration of total morphine, codeine, thebaine, papaverine and noscapine was measured using UPLC/MS/MS with positive ionization ESI.

**Results.** In urine samples collected between zero to 18 hours from poppy seeds consumption, morphine, codeine and thebaine were detected and in two samples traces of papaverine were found. Noscapine was not detected in any sample. After consumption of two tablets of the Thiocodin drug, the maximum values of morphine in urine concentrations reached 920–5130 ng/ml. Only for one volunteer the morphine in urine concentration did not exceed the limit of 1000 ng/ml.

The results presented here highlight the need for a more realistic approach to detect the presence of morphine uploads in urine, and the necessity to raise the limit of morphine concentration to the values unequivocally indicating intentional and excessive consumption of morphine uploads.

**Key words:** morphine in urine, interpretation of concentrations, assessment of mandatory limits

**Streszczenie – Wstęp.** Stężenia morfiny w moczu, ustalone jako dopuszczalne maksymalne wartości w badaniach medycznych (300 ng/ml) i antydopingowych (1000 ng/ml), nie pozwalają jednoznacznie osądzić, czy mamy do czynienia z przypadkiem dopingu czy uzależnienia od substancji psychoaktywnych. Konsumpcja produktów makowych i leków może wpłynąć na pozytywny wynik kontroli antydopingowej i innych testów narkotykowych.

