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# Measurement of 3-methylhistidine in spot urine from HIV-infected persons: an alternative screening method for muscle protein degradation to serum CK

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## Purpose of the study

3-methylhistidine (3-MH) acts as an in vivo label of the rate of myofibrillar protein breakdown. The aim of this study was to evaluate 3-MH measurement in spot urine as a simple screening method for muscle protein degradation in HIV-infected persons compared to creatine kinase (CK) measurement in blood.

## Methods

We prospectively measured serum creatinine (mg/dl) and serum CK (U/L) and 3-MH (µmol/L) in spot urine from 162 HIV-positive subjects at each visit. 3-MH was determined by HPLC after derivatization with fluorescamine.

## Summary of results

162 HIV-positive subjects were screened; two patients were excluded because of renal dysfunction. 160 HIV-positive patients (101 male) entered the study and a total of 397 visits were analysed. The median age at all visits was 44 years (range 21–75). Body mass index (BMI) was 24.8 ± 5.1 (men 24.93 ± 0.29, women 24.5 ± 0.48). Patients were without antiretroviral treatment (ART) at 24% of visits and had an undetectable serum HIV load (<50 copies/ml) at 50% of visits. The median CD4 count was 437 cells/µl (SD 205.1). CK, creatinine and 3-MH did not correlate with the number of visits.

A positive correlation with the BMI was found for CK and creatinine, but not for 3-MH. Compared to men, women had significantly lower levels of 3-MH (195.5 ± 10.5 vs. 252.2 ± 9.6, $p = 0.0002$), creatinine (0.68 ± 0.01 vs. 0.85 ± 0.01, $p < 0.0001$) and CK (106 ± 7.6 vs. 156.9 ± 8.2, $p < 0.0001$). Patients with CK levels above 300 U/L (n = 31) had significantly higher 3-MH levels than patients with CK below 50 U/L (n = 41) ($p = 0.037$). Otherwise there was no correlation between CK and 3-MH. ART in general, and zidovudine (177 visits) and tenofovir (90 visits) in particular, did not influence the levels of CK, creatinine and 3-MH.

## Conclusion

In conclusion, measurement of 3-MH on spot urine samples is not useful for assessing changes in muscular protein degradation. A meat-free diet, 24-hour urine collection and refraining from physical activity might reduce confounding factors of 3-MH secretion.