Sphingoid Bases as Possible Diagnostic Parameters

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Aim. To determine the concentrations and ratios of sphingoid bases, sphinganine and sphingosine, in the serum and urine of healthy individuals, as a basis for the normal value range, which may be useful in the diagnosis of diseases characterized by sphingolipid metabolism impairment. Possible sex differences were also investigated, as well as effects of hormonal changes on sphingoid base concentrations during pregnancy or menopause.
Method. Sphingolipids were extracted from the serum and urine and hydrolyzed. Sphinganine and sphingosine were determined by high performance liquid chromatography. The analysis included serum and urine samples of 20 men and 20 women, and urine samples of 5 healthy postmenopausal and 5 healthy pregnant women.
Results. Serum concentrations of free and total sphingoid bases showed no major variations in healthy individuals of both sexes: total sphingosine 28.28±8.96×103 pmol/mL in men and 22.52±10.19×103 pmol/mL in women (p=0.080); total sphinganine 0.61±0.15×103 pmol/mL in men and 0.58±0.25×103 pmol/mL in women (p=0.574). Urine concentrations showed greater variability. Hormonal changes associated with menopause or pregnancy significantly decreased the urinary concentrations of total sphinganine in postmenopausal women, and increased free sphinganine/sphingozine ratio.
Conclusion. Serum but not urine concentrations of sphingoid bases could be used as a sensitive indicator in the diagnosis of the diseases associated with sphingolipid metabolism impairment.

Key words: blood chemical analysis; chromatography, liquid; reference values; sphingolipids; sphingosine; urine