
Urinary neurotransmitter testing is the preferred method of assessing nervous system function due to its stability and sensitivity. Neurotransmitters in the urine can be applied to clinical practice to evaluate nervous system function and monitor treatment efficacy. Historically, urinary neurotransmitters have been utilized to diagnose pheochromocytoma, but more recent research shows this testing may be valuable in assessing psychiatric and inflammatory disorders.


The purpose of this paper is to investigate an improved method for extracting, processing and measuring serotonin in platelets, and to investigate the correlations of levels of serotonin in CSF with levels in platelets, plasma, and urine.

- The correlations for the two groups are very similar, with the highest correlations for CSF vs. platelets (r=0.97 for both humans and rats), and lower correlations for CSF vs. plasma (r=0.77 for rats and r=0.57 in humans) and urine (0.67 in rats and r=0.62 in humans).
- For urine, the level of serotonin in the present study is in good agreement with several other studies, after converting the present units (nmol/24 h) to nmol/mol creatinine, and assuming urinary creatinine production is 10 mmol/day.
- The strong correlations between serotonin levels in the different samples for both humans and rats suggest that all methods of measuring serotonin give somewhat similar results.


Urinary and CSF neurotransmitters and metabolites were tested before and after treatment of manic patients with lithium carbonate. Before treatment, 3-methoxy-4-hydroxyphenylglycol (MHPG) and norepinephrine were elevated in manic patients compared to depressed or normal subjects. During lithium treatment, both CSF MHPG and urinary norepinephrine were reduced regardless of response to treatment. However, urinary MHPG correlated with symptom severity indexes and increased during treatment in non-responders compared to responders. The results of this study support a connection between increased noradrenergic activity and mania. As reduction in noradrenergic activity following lithium treatment did not significantly differ by treatment response, a relationship between the two variables was not established.


Groups were compared for cardiovascular reactivity to mental stress, 24-hour urinary neuroendocrine measures, and psychosocial profiles. Urinary cortisol, NE (norepinephrine), EPI (epinephrine), and DA...
(dopamine) were measured to examine circulating indices of HPAC (hypothalamic-pituitary-adrenal-cortical) vs. SAM (sympathetic-adrenal-medullary) axis activation.

- The HEDI (high eating disorder inventory scores) group had significantly lower 24-hour urinary NE levels compared with the LEDI (low eating disorder inventory scores) group.
- HEDI women exhibited exaggerated, and not blunted, cardiovascular reactivity to laboratory stress relative to LEDI women. We found that the HEDI women had increased blood pressure and HR reactivity compared with women who scored lowest on the same subscale.
- We also observed that they [HEDI women] had lower 24-hour urinary NE levels. This relationship between cardiovascular reactivity and NE may at first seem paradoxical because both are thought to reflect sympathetic nervous system (SNS) activation. However, consistent with pharmacological theory, catecholamine-induced changes in β-adrenergic receptor responsivity may underlie this relationship. For example, the decreased 24-hour urinary NE evident in our HEDI group is consistent with studies by George et al. and Pirke et al., which found decreased basal plasma NE in women with established BN relative to controls. Of particular relevance is that George et al. also found increased cardiac response to isoproterenol (β-receptor agonist) in BN women vs. controls, suggesting that lower NE levels may be associated with up-regulation of the cardiac β-adrenergic receptors in bulimic women. If this is the case, this could account for both the increased cardiovascular reactivity and decreased 24-hour urinary NE level observed in the HEDI women in the present study.


Results of the present study show that in patients with ADHD, catecholamine concentrations in urine are higher compared to healthy children. Moreover, NA (noradrenaline) concentrations correlated significantly with hyperactivity of children with ADHD.

- It may be argued that urine catecholamine levels reflect the changes in peripheral autonomic system and that their measurements have little value in psychiatric disorders. However, as reviewed by Pliszka et al. (1996), peripheral sympathetic nervous system activity correlates with that in the locus coeruleus and altering peripheral catecholamines has been found to induce central effects.
- The present observation of positive correlation between NA concentrations in urine and the degree of hyperactivity in children with ADHD suggest that concentrations in urine, though only indirect measures of catecholamine activity, may be of clinical relevance


Fifteen children diagnosed with autism spectrum disorder were treated with sulforaphane in this open label study. Improvement was measured using the Aberrant Behavior Checklist (ABC) and the Social Responsiveness Scale (SRS). Fasting urine metabolites were measured to find if a correlation existed between certain metabolites and whether study subjects improved with the treatment. Increases in the urinary neurotransmitters tested, with the exception of N-methylglutamate, correlated with improved scores on both the ABC and the SRS.


Cortisol and catecholamine levels were measured from 12-hour urine samples taken from 82 children upon admission to a Level 1 trauma center. Symptoms of PTSD and depression were assessed at a 6-week follow-up. The researchers concluded that elevated initial urinary cortisol and epinephrine levels directly after a trauma may correlate with increased risk of developing PTSD symptoms. This association was stronger in boys.


Ninety-one women in their 40s and 50s were evaluated using the Beck Depression Inventory and a portion of the
Spielberger State-Trait Anxiety Inventory. Epinephrine, norepinephrine and cortisol was then measured from a 24-hour urine collection. Higher levels of norepinephrine and cortisol were seen in women with higher scores of depression and anxiety symptoms, while epinephrine levels were unrelated to symptoms scores. These findings suggest that depression and anxiety may be associated with increased sympathetic nervous system activity.


2-hour urinary epinephrine, norepinephrine and their metabolites were measured in children with ADHD while completing mentally stressful tasks. Children with comorbid anxiety had higher epinephrine levels than children without.


The aim of this study was to identify possible peripheral biological markers for AD-HKD in order to aid with diagnosis and to monitor the efficacy of treatment. This required the development of an accurate and robust method for the analysis of the possible biomarkers.

- A variety of methods have been developed to measure serotonin including spectrophotometry, LC-fluorometry, enzyme immunoassay, and LC-electrochemical detection. LC-mass spectrometric method is, however, the method of choice as tandem LCMS method provides increased selectivity while reducing the need for dependence on chromatographic separation.
- The LC-MS/MS based method described herein delivers excellent sensitivity, selectivity and robustness for dopamine, serotonin and its key metabolite, 5-HIAA, in clinical samples.
- This study outlines a validated method for the multiplex assay of serotonin, dopamine and 5-HIAA in urine. The method presented is a robust, sensitive and selective method for the quantitation of these analytes.


Catecholamines (CATs) are natural molecules that act as neurotransmitters and hormones. Each of the primary endogenous CATs has characteristic physiologic actions. Epinephrine (E) is quantitatively the most important substance produced by the adrenal medulla; dopamine (D) and norepinephrine (NE) are important neurotransmitters in the central nervous system. Determination of CATs in body fluids is used to help identify neuroendocrine disorders and other physiologic and pathologic conditions.

- A commonly accepted method of catecholamine analysis in biological fluids is liquid chromatography (LC) using a reversed-phase LC column in conjunction with ion-pairing reagents with electrochemical (ECD) or fluorescent detection.
- The method comparison was performed on 120 patient urine specimens submitted for analysis of free CATs.
- We present a method for the selective analysis of CATs that uses positive-ion mode ES ionization. The advantages of the method include its high specificity, which allows the selective quantification of E, NE, and D in the presence of drugs that commonly interfere with HPLC analysis.


In this study we present a rapid, sensitive and precise gas chromatography/mass spectrometry method for quantification of tryptophan in the urine of autistic and healthy children. This method was used for monitoring the level of tryptophan in urine among autistic children (on a diet low in casein and gluten and without a restricted diet) and healthy children.

- In this study a simple, precise, sensitive, non-invasive, cost-effective gas chromatographic/mass spectrometry method for determination of tryptophan was developed and validated. An excellent linearity was obtained over the entire concentration range, and the correlation coefficient (r2) was greater than 0.998.
- The control group showed higher values of tryptophan in urine than in the autistic children from A1 (autistic children with restricted diet) and A2 (autistic children without diet) groups. There were significant differences between urinary tryptophan values in groups C and A1 (p<0.05).