

The role of plasma metanephrines and plasma catecholamines in the biochemical testing for Pheochromocytoma

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Background

First line screening for pheochromocytoma, as recommended by Endocrine Society guidelines, is to determine plasma, free or urinary fractionated metanephrines. We routinely offer the latter. Although negative results rule out pheochromocytoma, it is not uncommon to see borderline results which require further investigation. In this situation we have historically relied on the measurement of plasma catecholamines in the clonidine suppression test (CST). Plasma metanephrines, however, offer a simpler and cheaper alternative. We compared results for CST with plasma metanephrine results.

Aim

To compare results for plasma metanephrines with clonidine suppression test results.

Method

To date 26 patients attending clinic for clonidine suppression test to rule out pheochromocytoma also had a sample collected for plasma metanephrine analysis. This sample was collected after the patient had been supine for at least 30 minutes and before the clonidine suppression test commenced.

Results

Patient	Urinary Metanephrines	Plasma Metanephrines	Clonidine Suppression Test
1	Elevated Urinary NMET	Abnormal	Abnormal
2	Elevated Urinary NMET and MET	Abnormal	Abnormal
3	Elevated Urinary NMET	Abnormal	Abnormal
4	Elevated Urinary NMET	Abnormal	Abnormal
5	Elevated Urinary NMET and MET	Abnormal	Abnormal
6	Elevated Urinary NMET	Abnormal	Abnormal
7	Elevated Urinary NMET	Abnormal	Equivocal
8	Elevated Urinary NMET	Abnormal	Normal
9	Elevated Urinary NMET	Abnormal	Abnormal
10	Elevated Urinary NMET	Normal	Normal
11	Elevated Urinary NMET	Normal	Normal
12	Elevated MET	Normal	Normal
13	Elevated Urinary NMET and MET	Normal	Normal
14	Elevated NMET 06/17, normal 10/17	Normal	Normal
15	Elevated Urinary NMET	Normal	Normal
16	Elevated Urinary NMET	Normal	Normal
17	Elevated NMET 06/17, normal 10/17	Normal	Normal
18	Elevated MET	Normal	Normal
19	Elevated Urinary NMET	Normal	Normal
20	Elevated Urinary NMET	Normal	Normal
21	Elevated Urinary NMET	Normal	Normal
22	Elevated Urinary NMET and MET	Normal	Normal
23	Elevated Urinary NMET	Normal	Normal
24	Elevated Urinary NMET	Normal	Normal
25	Elevated NMET 06/17, normal 04/18	Normal	Normal
26	Elevated Urinary NMET and MET	Normal	Normal

NMET-normetanephrine, MET-metanephrine

Discussion

Results demonstrate concordance between supine plasma metanephrine and CST results when both were normal (n=17). Nine had abnormal supine plasma metanephrine results, 7 of which also had abnormal clonidine suppression test confirming the biochemical diagnosis of pheochromocytoma. In the remaining 2 patients with abnormal supine plasma metanephrines one had equivocal clonidine suppression test (this patient was on Imipramine and adrenal imaging was negative and there was a low suspicion of pheochromocytoma) and the other had a normal clonidine suppression test and negative imaging and pheochromocytoma was excluded.

Conclusion

These preliminary results from 26 patients demonstrate that in the diagnosis of pheochromocytoma plasma metanephrines are an appropriate test in patients with elevated urinary metanephrines. If plasma metanephrine is normal then a CST is not required and pheochromocytoma can be excluded. For cases where supine plasma metanephrines are abnormal and diagnostic uncertainty remains then CST can be used.

Reference

Pheochromocytoma and Paraganglioma: An Endocrine Society Clinical Practice

Guideline. Lenders JWM, Quan-Yang D, Eisenhofer G et al *The Journal of Clinical Endocrinology & Metabolism*, Volume 99, Issue 6, 1 June 2014, Pages 1915–1942