Detecting pheochromocytoma: defining the most sensitive test

Ulrich Gueller, Joe Turek, Steve Eubanks, Elizabeth R Delong, Daniel Oertli & Jerome M Feldman

OBJECTIVE
To define the most sensitive biochemical test to establish the diagnosis of pheochromocytoma and also to assess the potential role of iodine 131-labeled metaiodobenzylguanidine scintigraphy (I-MIBG) in the diagnosis of this tumor.

SUMMARY BACKGROUND DATA
Pheochromocytoma is a rare, catecholamine-producing tumor with preferential localization in the adrenal gland. Despite its importance, the most sensitive test to establish the diagnosis remains to be defined.

METHODS
Prospective data collection was done on patients with pheochromocytoma treated at the Duke University Medical Center and the Durham Veterans Affairs Medical Center, Durham, NC. All urinary, plasma, and platelet analyses were highly standardized and supervised by one investigator (J.M.F.). I-MIBG scans were independently reviewed by 2 nuclear medicine physicians.

RESULTS
A total of 152 patients (55.3% female) were enrolled in the present analysis. Patients were predominantly white (73.7%). Spells (defined as profuse sweating, tachycardia, and headache) and hypertension at diagnosis were present in 51.4% and 66.6%, respectively. Bilateral disease was found in 12.5%, malignant pheochromocytoma in 29.6%, and hereditary forms in 23.0%. The most sensitive tests were total urinary normetanephrine (96.9%), platelet norepinephrine (93.8%), and I-MIBG scintigraphy (83.7%). In combination with I-MIBG scintigraphy, platelet norepinephrine had a sensitivity of 100%, plasma norepinephrine/MIBG of 97.1%, total urine normetanephrine/MIBG of 96.6%, and urine norepinephrine/MIBG of 95.3%.

CONCLUSIONS
The tests of choice to establish the diagnosis of pheochromocytoma are urinary normetanephrine and platelet norepinephrine. A combination of I-MIBG scintigraphy and diagnostic tests in urine, blood, or platelets does further improve the sensitivity. We thus advocate performing an MIBG scan if the
diagnosis of pheochromocytoma is clinically suspected and catecholamine measurements are within the normal range.

type: journal paper/review (English)
date of publishing: 1-2006
journal title: Ann Surg (243/1)
ISSN print: 0003-4932
pages: 102-7