Pheochromocytoma:

Definition

Introduction to Pheochromocytoma

25-50% of Pheo patients who die in hospital do so during anesthesia induction or surgery. Can be part of multiple endocrine adenoma IIa or IIb, autosomal dominant. MEN IIa is medullary thyroid, parathyroid adenoma, and pheo. MEN IIb aka pheo in assoc w/ phakomatoses (von Recklinghausen neurofibromatosis, VHL, cerebellar hemangioblastoma). MRI or CT to locate tumors. Familial often bilateral.

Signs/Symptoms/Diagnosis

sweating, HA, HTN, orthostatic hypotension, Hx HTN or arrhythmia w/ anesthesia or abdomainal exam. Paroxysmal HA + sweating + HTN more sensitive than any single blood test. Other Dx tests include : Vanillylmandelic acid, Catecholamine (nl 200-2000, pheo 2000-20,000), Metanephrine

Treatments

Using alpha-blocker (prazosin, phenoxybenzamine) prior to surgery reduces mortality from 50% to 5%. Alpha-blocker Rx also reduces fasting glucose level and decreases myocarditis. If arrhythmia or tachycardia use propranolol with alpha blocker. Don’t use beta-blocker alone, can have unopposed alpha severe hypertension. If bp is < 165/90 for 48hrs, orthostatic hypotension IS present, no ST-T changes, and no PVC’s pt can most safely undergo anesthesia and surgery. Avoid desflurane because of non-neurogenic chatecholamine release. Use nitroprusside for HTN, surgerical manipulation of tumor can cause blood chatechol levels of 200,000-1,000,000. My need exogenous chatecholamines after venous drainage ligated.

Pheochromocytoma Markers

- Vanillylmandelic acid excretion (Sensitivity/Specificity/PPV/NPV) 81/ 97/ 27.0/ 0.20
- Catecholamine excretion (Sensitivity/Specificity/PPV/NPV) 82/ 95/ 16.4/ 0.19
- Metanephrine excretion (Sensitivity/Specificity/PPV/NPV) 83/ 95/ 16.6/ 0.18
- Abdominal computed tomography (Sensitivity/Specificity/PPV/NPV)92/ 80/ 4.6/ 0.10
- Concurrent paroxysmal HTN, H/A, sweating, and tachycardia[‡] (Sensitivity/Specificity/PPV/NPV) 90/95/18.0/0.10

Pheochromocytoma: Rx of HTN

Definition

Preoperative Hypertension Treatment: Adrenergic blockade is most helpful in treating hypertension preoperatively. These drugs probably reduce the complications of hypertensive crisis, the wide BP fluctuations during manipulation of the tumor (especially until venous drainage is obliterated), and the myocardial dysfunction that occurs perioperatively. A reduction in mortality associated with resection of pheochromocytoma (from 40% to 60% to the current 0% to 6%) occurred when α-adrenergic receptor blockade was introduced as preoperative therapy for such patients. Perioperative α-adrenergic receptor blockade with prazosin or phenoxybenzamine (t 1/2 ~ 24 hours) will help by counteracting the excessive catecholamine stimulation that results in hypertension. This medication has been recommended to commence at least 10-14 days prior to surgery. β-Adrenergic receptor blockade with propranolol is suggested for patients who have persistent arrhythmias or tachycardia because these conditions can be precipitated or aggravated by α-adrenergic receptor blockade. β-Adrenergic receptor blockade should not be used without concomitant α-adrenergic receptor blockade lest the

vasoconstrictive effects of the latter go unopposed and thereby increase the risk for dangerous hypertension.

Other drugs, including calcium channel blocking drugs, clonidine, dexmedetomidine, and magnesium, have also been used to achieve suitable degrees of α-adrenergic blockade before surgery.

Intraoperative Hemodynamic Treatment: because of ease of use, there is a preference to give phenylephrine hydrochloride or norepinephrine for hypotension and nitroprusside for hypertension. Phentolamine (t 1/2 19 mins) has too long an onset and duration of action.

For further reading. Please refer this below article.

https://academic.oup.com/bjaed/article/16/5/153/2389873

https://doi.org/10.1093/bjaed/mkv033