Neuro Quiz 21

This quiz is being published on behalf of the Education Committee of the SNACC

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Quiz Team
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1. Which of the following are due to endocrine hypo-secretion secondary to pituitary disease?

A. Addison’s disease
B. Graves disease
C. Diabetes Insipidus
D. Galactorrhea
1 A. Addison’s disease

✗ Addison’s disease
  ✗ A primary adrenocortical insufficiency
  ✗ Causes: auto-immune, infection, hemorrhage, or malignancy

✗ Adrenocortical insufficiency secondary to pituitary disease (low ACTH)
  ✗ Low glucocorticoids
  ✗ Renin-angiotensin-aldosterone axis is preserved, and fluid and electrolyte disturbance is less severe
Graves disease is an autoimmune disorder leading to overactive thyroid (hyperthyroidism) and not ‘hypo-secretion’
1 C. Diabetes insipidus

- Diabetes Insipidus (DI) results due to failure of Anti-Diuretic Hormone secretion
- ADH or Vasopressin is a peptide hormone that increases water permeability of the kidney's collecting duct and distal convoluted tubule by inducing translocation of aquaporin, water channels in the plasma membrane of collecting duct cells
- Desmopressin, a synthetic analogue of ADH, longer half-life and lacking the vasoconstrictor action, is used to treat DI
1 D. Galactorrhea

- Hyper-prolactinemia causes galactorrhea and menstrual dysfunction in women and hypogonadism, reduced libido and erectile dysfunction in men
- Treatment of hyper-prolactinemia is dopamine agonists, such as bromocriptine & cabergoline
2. Which of the following combinations of endocrinal dysfunction and medical management are INCORRECT?

A. Acromegaly – Octreotide
B. Cushing’s disease – Ketoconazole
C. Prolactinoma – Cabergoline
D. Thyrotropinoma – L-iodothyronine
2 A. Acromegaly - Octreotide

- Although, surgical excision of pituitary adenoma is the primary treatment recommended, acceptable pharmacological therapy for acromegaly, include

  - Suppression of GH secretion
    - Somatostatin analogues- Octreotide
    - Dopamine analogues – Bromocriptine, Cabergoline

  - Block GH action
    - GH receptor antagonists - Pegvisomant
2 B. Cushing’s disease - Ketoconazole

Management of Cushing’s disease include
- Surgical excision of pituitary or adrenal tumor if present
- Control cortisol production in adrenal
  - Ketoconazole, Metyrapone
- Block cortisol effect on tissues
  - Mifepristone
- Decrease ACTH production from the pituitary
  - Pasireotide
The first line of treatment for prolactinomas is dopamine agonists like cabergoline and bromocriptine. Surgery is indicated only if medical therapy fails or is not tolerated.
2 D. Thyrotropinoma – L-iodothyronine

- Pituitary tumor secreting TSH will cause increased production of tri-iodo-thyronine (T3) and T4 from the thyroid gland, causing hyperthyroidism

- Management of thyrotropinoma are
  - Surgery – excision of pituitary tumor
  - Anti-thyroid drugs – block production of T3, T4
    - Methimazole
    - Propylthiouracil
    - Beta-blockers
3. Anesthetic implications of Acromegaly include all, EXCEPT

A. **Upper airway obstruction**
B. **Hypertension**
C. **Cardiomyopathy**
D. **Reactive airway disease**
3 A. Upper airway obstruction

- The combination of macrognathia, macroglossia, and enlargement of the upper airway soft tissue can contribute to upper airway obstruction
- Up to 70% of acromegalic have obstructive sleep apnea
- Large size equipment would be required for airway management
3 B. Hypertension

❌ Patients with acromegaly may have refractory hypertension with eccentric left ventricular hypertrophy
3 C. Cardiomyopathy

- Patients with acromegaly may have ischemic heart disease, arrhythmias, heart block, cardiomyopathy, and bi-ventricular dysfunction
- Preoperative echocardiography is useful to assess left ventricular size and function
3 D. Reactive airway disease

- Along with a high incidence of obstructive sleep apnea, the respiratory function may be additionally compromised by kyphoscoliosis and proximal myopathy, resulting in a restrictive respiratory pathology.
- Reactive airway disease is not a feature of acromegaly
4. Anesthetic implications of Cushing’s disease include all, EXCEPT

A. **Systemic hypertension**
B. **Obstructive sleep apnea**
C. **Glucose intolerance**
D. **Increased sensitivity to succinylcholine**
4 A. Systemic hypertension

× More than 80% of patients with Cushing’s disease have systemic hypertension, and may be refractory to usual treatment

× Eccentric left ventricular hypertrophy and diastolic dysfunction is seen in patients with long-standing disease
4 B. Obstructive sleep apnea

✗ With truncal obesity, soft tissue fat deposition, ‘moon facies’, and ‘buffalo hump’, these patients have a high incidence of obstructive sleep apnea
4 C. Glucose intolerance

✗ Impaired glucose tolerance is seen in almost two-thirds of patients with Cushing’s disease, half of whom have diabetes
4 D. Increased sensitivity to succinylcholine

✗ Cushing’s disease is associated with myopathy and proximal muscle weakness, however, a change in susceptibility to depolarizing or non-depolarizing muscle relaxants has not been documented
5. Which of the following statements about use of a Lumbar Intrathecal catheter during trans-sphenoidal pituitary surgery is FALSE?

A. Can be used to assist visualization of the tumor by injecting air

B. Injection of saline through the catheter can aid to ‘push’ the tumor into the surgical field

C. Can be used postoperatively to reduce inadvertent CSF rhinorrhea

D. Can be used to administer antibiotics for postoperative meningitis
5 A. Can be used to assist visualization of the tumor by injecting air

- Small amount of air injected through the intrathecal catheter can delineate the dural layer around the sella turcica during fluoroscopy.
- This was used to assist the surgical approach
5 B. Injection of saline through the catheter can aid to ‘push’ the tumor into the surgical field

- During anesthesia, the brain tissue would recede into the cranium due to the lowered intracranial pressure
- An aliquot of saline injected through the intrathecal catheter would transiently raise the ICP and ‘push’ the brain and the pituitary tumor, into the surgical field
5 C. Can be used postoperatively to reduce inadvertent CSF rhinorrhea

✖ One of the complications of trans-sphenoidal pituitary surgery is CSF rhinorrhea
✖ Draining the CSF through the intrathecal catheter, helps lower the CSF pressure and thus the rhinorrhea, aiding in the early healing of the dural tear
D. Can be used to administer antibiotics for postoperative meningitis

- In the unfortunate event of a patient developing meningitis in the postoperative period, the intrathecal catheter is removed so as to remove the possible source of infection.
- Systemic antibiotics is used to manage meningitis following trans-sphenoid surgery.

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References

- Smith M, Hirsch NP. Pituitary disease and anaesthesia. BJA 2000; 85: 3-14