NEURO QUIZ 45
EHLERS DANLOS SYNDROME

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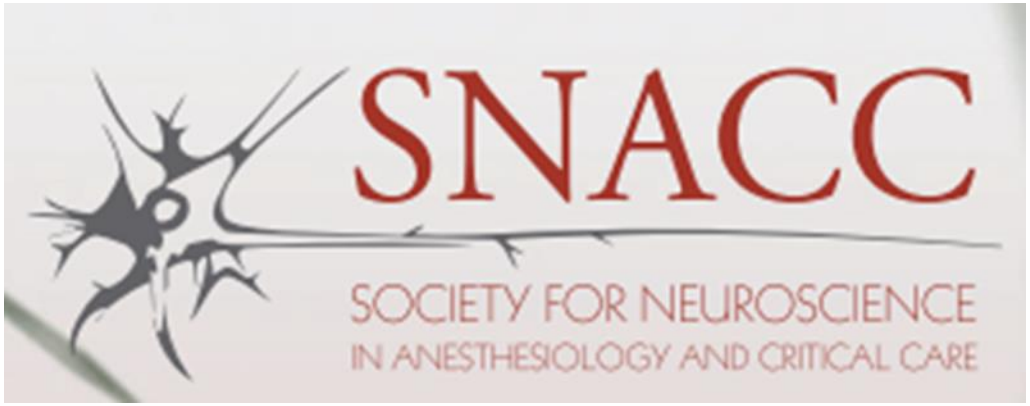
START



1. Regarding Ehlers Danlos Syndrome (EDS) which of the statement is CORRECT?

A. Chronic pain is usually localized to the hypermobile joints
B. Headache is rare, but severe when it occurs
C. EDS is more common among males
D. May be associated with Mast cell suppression

NEXT QUESTION

1A. Chronic pain is usually localized to the hypermobile joints

- Chronic pain in EDS is common (90%) and may be severe
- Most times pain is the first symptom to present
- The pain could be localized to the joints that sub-luxates and are injured OR can be generalized myalgia with fatigue

BACK TO QUESTION

NEXT QUESTION

1B. Headache is rare, but severe when it occurs

- EDS patients commonly suffer headaches with exacerbations
- The headache type can be varied
  - Migraines, Intracranial hypertension, cranio-cervical instability, temporomandibular joint dis.
- EDS may be considered a risk factor for migraine

BACK TO QUESTION

NEXT QUESTION

1C. EDS is more common among males

- EDS is a heterogeneous group of genetic connective tissue disorders, characterized by
  - Joint hypermobility
  - Skin extensibility
  - Tissue fragility
- EDS has a female predilection

BACK TO QUESTION

NEXT QUESTION

1D. May be associated with mast cell suppression

- Mast cells are found in connective tissues and mucosa and congregate around vessels, nerves and lymphatics
- Possible link between EDS and Mast cell Activation disorders (NOT suppression) have been suggested

BACK TO QUESTION

NEXT QUESTION

2. Which of the following statement about EDS and Chiari Malformation (CM) is CORRECT?

A. Evidence suggests a causal relationship between EDS and CM
B. The headache associated with CM is worse on lying down
C. In patients with EDS, clinical manifestations of CM presents at a later age
D. Definitive surgery is indicated urgently if neurological symptoms develop

PREVIOUS QUESTION NEXT QUESTION

2A. Evidence suggests a causal relationship between EDS and CM

- Chiari malformation (type I) has been associated with hypermobile EDS but there are NO evidence to suggest a causation

BACK TO QUESTION

NEXT QUESTION

2B. The headache associated with CM is worse on lying down

- The downward migration of the cerebellar tonsils and brainstem through the foramen magnum causes obstruction of normal circulation of CSF, resulting in occipital headache
- Headache in CM is worsened by coughing and straining and relieved by lying down
- Often confused with post-dural puncture headache

BACK TO QUESTION

NEXT QUESTION

2C. In patients with EDS, clinical manifestations of CM presents at a later age

- The average age of onset tends to be younger in the CMI and EDS subgroup, when compared to the general CMI population

BACK TO QUESTION

NEXT QUESTION

2D. Definitive surgery is indicated urgently if neurological symptoms develop

- There is no universally agreed upon surgical threshold for CMI, but surgery should be urgently performed in the presence of progressive neurological deficits, and expanding syringomyelia

BACK TO QUESTION

NEXT QUESTION

3. Which of the following clinical manifestation seen in EDS is NOT a direct effect of the hyperlaxity of the connective tissues?

A. Tethered Cord Syndrome
B. Atlantoaxial instability
C. Occipital headache
D. Movement disorders

PREVIOUS QUESTION NEXT QUESTION

3A. Tethered Cord Syndrome

- Tethered cord syndrome (TCS) in EDS is most often associated with a structurally abnormal *filum terminale*
- Characterized by low back pain, and…
- Clinical triad of
  - Neurogenic bladder
  - Lower extremity weakness and sensory loss
  - Musculoskeletal abnormalities

BACK TO QUESTION

NEXT QUESTION

3B.Atlantoaxial instability

- Atlantoaxial instability is a potential complication of EDS due to ligamentous laxity at the atlanto-occipital and atlantoaxial joints

BACK TO QUESTION

NEXT QUESTION

3C.Occipital headache

- Occipital headache could be due to Cranio-cervical instability, which is recognized as a manifestation of ligamentous laxity in EDS
- Other cause for occipital headache could be CM or intracranial hypertension

BACK TO QUESTION NEXT QUESTION

3D.Movement disorders

- Pain and trauma are frequent components of EDS, and there is a significant body of literature suggesting movement disorders may arise from extracranial trauma
- Movement disorders could be hyperkinetic (dystonia, myotonia, tremor) or hypokinetic
- Movement avoidance to limit pain can lead to fixed dystonia

BACK TO QUESTION NEXT QUESTION

4. Which of the following statements about EDS is FALSE?

A. There could be a variety of causes for headache in EDS
B. Idiopathic intracranial hypertension could be due to a cerebral venous abnormality
C. Dystonia and movement disorders are usually post traumatic
D. Musculoskeletal pain is a late manifestation of EDS

PREVIOUS QUESTION NEXT QUESTION

4A.There could be a variety of causes for headache in EDS

- EDS patients commonly suffer headaches with exacerbations
- The headache type can be varied
  - Migraines, Intracranial hypertension, cranio-cervical instability, temporomandibular joint dis.
- EDS may be considered a risk factor for migraine

BACK TO QUESTION

NEXT QUESTION

4B. Idiopathic intracranial hypertension (IIH) could be due to a cerebral venous abnormality

- IIH, or *pseudotumor cerebri*, is characterized by increased intracranial pressure (ICP), headaches, visual disturbances, photophobia, and occasionally tinnitus
- 93% of patients with IIH have focal venous sinus stenosis on MR venography, suggesting a reduced CSF absorption due to an abnormal venous system

BACK TO QUESTION NEXT QUESTION

4C. Dystonia and movement disorders are usually post traumatic

- Movement disorders could be hyperkinetic (dystonia, myotonia, tremor) or hypokinetic
- Pain and trauma are frequent components of EDS, and there is a significant body of literature suggesting movement disorders may arise from extracranial trauma
- Movement avoidance to limit pain can lead to fixed dystonia

BACK TO QUESTION NEXT QUESTION

4D. Musculoskeletal pain is a late manifestation of EDS

- EDS is associated with high prevalence of myalgia, nocturnal muscle cramps involving the calves, hypotonia, progressive muscle weakness, poorly developed musculature
- Musculoskeletal pain starts early, is chronic and debilitating
- So, this statement is false

BACK TO QUESTION

NEXT QUESTION

5. Cardiovascular autonomic dysfunction in EDS is multifactorial and the possible mechanisms include all, EXCEPT?

A. Reduced compliance of the blood vessel wall to venous congestion
B. Adrenergic hyper-responsiveness
C. Mast cell activation and histamine release
D. Brain-stem impingement due to Chiari malformation

PREVIOUS QUESTION FURTHER READING

5A. Reduced compliance of the blood vessel wall to venous congestion

- Abnormal connective tissue in dependent blood vessels with veins distending excessively in response to ordinary hydrostatic pressures
- Increased venous pooling and its hemodynamic and symptomatic consequences
- This statement is false as the veins can be excessively compliant

BACK TO QUESTION

FURTHER READING

5B. Adrenergic hyper-responsiveness

- There is evidence of alpha-adrenergic and beta-adrenergic hyper-responsiveness

BACK TO QUESTION

FURTHER READING

5C. Mast cell activation and histamine release

- Histamine can induce hypotension and tachycardia and recently mast cell activation, and excessive histamine release has been identified in cases of EDS

BACK TO QUESTION

FURTHER READING

5D. Brain-stem impingement due to Chiari malformation

- Chiari malformation may also trigger cardiovascular autonomic disturbances that resolve following decompressive surgery

BACK TO QUESTION

FURTHER READING

Ehlers–Danlos syndromes (EDS)

- The Ehlers–Danlos syndromes (EDS) are a heterogeneous group of heritable connective tissue disorders characterized by joint hypermobility, skin extensibility, and tissue fragility
- Headache is common and with various etiology
  - Migraines, muscle tension, intracranial hypertension, cranio-cervical instability, and cervical spine disorders, temporomandibular joint disease, & carotid dissection

BACK TO QUESTION 1, 2, 3, 4, 5

FURTHER READING

Neurological manifestations of EDS

- Neurological manifestations that arise include weakness of the ligaments of the cranio-cervical junction and spine, early disc degeneration, and weakness of the epineurium and perineurium surrounding peripheral nerves
- Increased prevalence of migraine, idiopathic intracranial hypertension, Tarlov cysts, tethered cord syndrome, and dystonia

Henderson Sr. FC, et al.. Neurological and spinal manifestations of the Ehlers–Danlos syndromes. AmJ Med Genet Part C Semin Med Genet 2017; 175C:195–211.

BACK TO QUESTION 1, 2, 3, 4, 5

FURTHER READING

Autonomic dysfunction in EDS

- Tachycardia, hypotension, gastrointestinal dysmotility and disturbed bladder function and sweating regulation
- Cardiovascular autonomic dysfunction can present as
  - Postural tachycardia syndrome (POTS)
  - Neurally mediated hypotension (NMH), also referred to as vaso-vagal syncope or neuro-cardiogenic syncope
  - Orthostatic hypotension (OH) or delayed orthostatic hypotension
  - Orthostatic intolerance (OI)

Hakim A, et al,. Cardiovascular autonomic dysfunction in Ehlers–Danlos syndrome—Hypermobile type. Am J Med Genet Part C Semin Med Genet 2019;175C:168–174

BACK TO QUESTION 1, 2, 3, 4, 5

FURTHER READING

EDS & Mast Cell (MC) Activation

- MC are seen in two locations
  - Connective tissue, skin, and peritoneal cavity
    - Contain tryptase in their granules and express interleukin-5 (IL-5) and interleukin-6 (IL-6)
  - Mucosa (gut and respiratory)
    - Contain tryptase and chymase and express IL-4
- MC activation cause release of neuro-transmitters including histamine
- Strong evidence to suggest an association between EDS and Mast Cell activation disorder

Seneviratne SL, et al. Mast cell disorders in Ehlers–Danlos syndrome. Am J Med Genet Part C Semin Med Genet 2017;175C:226–236

BACK TO QUESTION 1, 2, 3, 4, 5

BACK TO FURTHER READING