

SELF ASSESSMENT IN NEUROANAESTHESIA

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Multiple Choice Questions - time allowed 30 minutes

1 Brain swelling causes

- a) a compensatory loss of CSF from inside the skull
- b) a reduction in cerebral arterial blood volume
- c) a reduction in cerebral venous blood volume
- d) an immediate rise in intracranial pressure (ICP)
- e) an estimated increase in ICP to 20 mmHg in a patient who has had a recent head injury which caused a brief period of unconsciousness

2 Cerebral venous blood volume is altered significantly by

- a) hyperventilating the patient
- b) placing the patient in a head-up position
- c) airway obstruction
- d) the patient coughing
- e) a fall in arterial blood pressure

3 Autoregulation

- a) is a central mechanism controlling ICP
- b) prevents a fall in cerebral blood flow (CBF) when there is a fall in arterial BP
- c) causes cerebral arterial dilatation when the arterial BP falls
- d) when the arterial BP rises to normal levels it leads to a fall in ICP in a patient with a swollen brain
- e) is unaffected by volatile inhalational agents

4 When the brain is stiff (low compliance) and enlarged, ICP

- a) rises only minimally when the patient coughs
- b) rises significantly with a small increase in arterial CO₂

- c) is unaffected by arterial desaturation (hypoxia)
- d) falls if the patient is put in the head-down position
- e) rises if the head is twisted to the left or right

5 Cerebral perfusion pressure (CPP)

- a) is satisfactory if more than than 70 mmHg in a patient with a head injury
- b) is calculated by adding mean arterial pressure (MAP) and ICP
- c) falls if arterial BP falls following induction of anaesthesia
- d) can be calculated by “guessing” ICP to be 20 mmHg after a head injury causing 5 min unconsciousness
- e) when low should be treated by infusing dextrose-saline solution

6 Cerebral blood flow

- a) is increased by acute hypocapnia (arterial CO₂ 30 mmHg)
- b) changes affect ICP when brain compliance is low (brain stiffer or less squashy)
- c) is decreased by inhalation volatile agents
- d) is unaltered directly by opioids
- e) is decreased by the hypnotic agent thiopentone

7 Following a severe head injury, ICP will rise to damaging levels if

- a) the patient develops airway obstruction
- b) the patient becomes severely hypertensive
- c) the patient is allowed to breathe halothane spontaneously during an anaesthetic
- d) arterial hypoxaemia occurs
- e) the patient suffers severe pain from other injuries which is not treated

8 In a multi-trauma patient with a head injury, opioids

- a) can be used to treat severe pain
- b) cannot be given to a ventilated patient

- c) can be given intramuscularly (IM) in the general ward
- d) will cause a change to ICP in a ventilated patient whose blood pressure remains constant
- e) will require the use of supplemental oxygen

9 Concerning inhalational volatile agents

- a) the increase in ICP with halothane can be minimised by hyperventilating the patient
- b) halothane is less soluble in blood than sevoflurane
- c) recovery following anaesthesia with isoflurane is more rapid than after sevoflurane
- d) during ether anaesthesia for neurosurgery, spontaneous respiration is acceptable
- e) when the brain is swollen, if arterial blood pressure falls during halothane anaesthesia, it will not cause harm

10 Concerning intravenous agents

- a) ketamine has no effect on ICP

- b) thiopentone reduces ICP by direct cerebral vasoconstriction
- c) a moderate fall in arterial BP following thiopentone in a patient with cerebral decompensation (raised ICP) need not be treated immediately
- d) propofol does not effect cerebral metabolic rate

SHORT ESSAY QUESTIONS - Time 45 mins

1 A patient who has had a head injury 12h previously which caused a brief period of unconsciousness now requires an urgent general anaesthetic. Describe your management and technique with reasons.

2 What are the methods of pain relief which can be used in a patient who has a fractured ankle and a recent significant head injury.

Answers for the self assessment section can be found on page 49.