

FOR SHORT ANSWERS

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FOR LONG ANSWERS

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ENDGAMES

We welcome contributions that would help doctors with postgraduate examinations

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STATISTICAL QUESTION

Allocation bias

Which, if any, of the following methods is unlikely to introduce bias in the allocation of people to treatments in a trial?

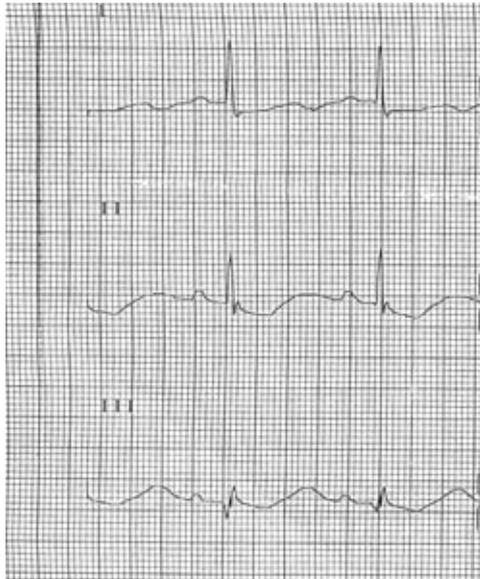
- People are matched according to age and sex, and for each person allocated to one treatment, a matching person is allocated to the other treatment
- The clinician treating the person tosses a coin to decide which treatment to give
- People whose initial letter of their last name is in the first half of the alphabet receive one treatment; those in the second half of the alphabet receive the other
- People with an even date of birth receive one treatment, those with an odd date of birth receive the other

Submitted by John Fletcher

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PICTURE QUIZ

The tired patient



A 66 year old female presented with a three week history of lethargy and malaise, reduced oral intake, and nausea but no vomiting. Medical history included hypertension, hypercholesterolaemia, and cervical spondylosis, and she was a lifelong smoker. Medications included simvastatin, aspirin, bendroflumethiazide, amlodipine, co-codamol, atenolol, and furosemide. Pulse oximetry showed reduced oxygen saturation (90% on air), but the patient was not tachypnoeic. She had a mild reduction in skin turgor; otherwise, the rest of her examination was unremarkable.

The patient's electrocardiogram is shown in the figure. In view of the reduced oxygen saturations, an arterial blood gas was performed. This test showed a pH of 7.631 (normal range 7.35-7.45), a pCO₂ of 6.49 kPa (4-6), a pO₂ of 7.79 kPa (10-13), a HCO₃ of 59.9 mmol/l (22-26), and a base excess of +35.2 (-2 to +2).

- What electrocardiogram abnormalities are present?
- What abnormalities are present in the arterial blood gas?
- What further investigation is needed?
- What is the unifying diagnosis?

Submitted by Bryan Renton Cite this as: *BMJ* 2009;338:b1623

ON EXAMINATION QUIZ

Head injury and brain anatomy

The answer to this question, and more questions on this topic, are available from www.onexamination.com/endgames until midnight on Wednesday.

This week's quiz is on infectious diseases and is taken from the MRCP Part 1 examination.

Which of the following statements, if any, apply to severe traumatic brain injury?

- Cerebral blood flow is usually maintained above a cerebral perfusion pressure of 50 mm Hg
- Cerebral oxygen consumption should be maximised
- Cerebral perfusion pressure is proportional to systolic blood pressure
- Mannitol increases cerebral blood flow
- There is loss of autoregulation

CASE REPORT

Persistently raised alkaline phosphatase in a woman with osteomalacia

A 45 year old woman was referred as an inpatient by psychiatrists for assessment of raised alkaline phosphatase. She was being treated for schizophrenia with fluphenazine and olanzapine, but had been otherwise well and denied any gastrointestinal symptoms or any bone or muscle pains. Her blood tests results were (normal ranges in brackets):

Sodium 141 mmol/l (135-145)
Potassium 3.9 mmol/l (3.5-5.0)
Chloride 105 mmol/l (98-110)
Anion gap 13 mmol/l (10-20)
Urea 7.8 mmol/l (3.0-7.1)
Creatinine 121 µmol/l (60-130)
Calcium 2.42 mmol/l (2.14-2.66)
Alkaline phosphatase 239 U/l (40-135)
Alanine transaminases 45 U/l (4-55)
Bilirubin 7 µmol/l (2-20)

Abdominal ultrasound showed normal anatomy of the gallbladder, common bile duct, common hepatic duct, and liver parenchyma. Further tests showed that the patient was vitamin D deficient, with a serum level of calcidiol of 23 nmol/l (normal range 25-250). Tests for anti-nuclear and anti-mitochondrial antibodies were negative. Vitamin D₂ (ergocalciferol) 5000 units daily and calcium 1500 mg daily were commenced.

Three months later, the patient's calcidiol level was

still only 22 nmol/l. On repeat testing, her alkaline phosphatase concentration had risen to 573 U/l. Vitamin D₂ was replaced with calcitriol 0.25 µg daily. Her calcidiol concentration went up to 126 nmol/l and alkaline phosphatase came down to 253 U/l when tested three months later.

Over the next five months, the patient's alkaline phosphatase concentration ranged from 267 U/l to 279 U/l, despite normal levels of calcidiol (i.e., 165 nmol/l). Given that the patient had no gastrointestinal symptoms, nutritional vitamin D deficiency was thought to be the cause of her vitamin D deficiency. However, the biochemical abnormalities did not return to normal after vitamin D replacement. Further investigations were positive for the following antibodies (normal values in brackets):

Anti-tissue transglutaminase IgA >200 U/ml (<10)
Anti-gliadin IgA >100 U/ml (<12)
Anti-gliadin IgG 60.5 U/ml (<12)

- This patient represents an atypical presentation of which disease?
- List three possible causes of a raised concentration of alkaline phosphatase.
- What is the most effective way to monitor patient adherence to a gluten free diet and to assess recovery of intestinal lesions?

Submitted by H U Rehman Cite this as: *BMJ* 2009;338:b1874