ENDGAMES

We welcome contributions that would help doctors with postgraduate examinations.
We also welcome submissions relevant to primary care. ▶ See thebmj.com/endgames for details

STATISTICAL QUESTION

Randomised controlled trials: understanding confounding

Researchers assessed the effectiveness of an exercise programme in reducing injurious falls among women at increased risk of falls and injuries. A multicentre parallel group randomised controlled trial study design was used. The intervention consisted of weekly supervised group sessions of progressive balance training offered in community based premises for two years, supplemented by individually prescribed home exercises. The control treatment was standard care. The study took place in 20 study centres throughout France. Participants were aged 75-85 years, living in their own home, and with reduced balance and gait capacities. In total, 706 women were recruited and randomly allocated to the intervention group (exercise programme; n=352) or control group (standard care; n=354). The random allocation of participants was stratified by study centre and body weight (<59 kg v ≥59 kg).

The primary outcome was the rate of injurious falls (moderate and severe). Secondary outcomes included physical tests and perception of overall physical function. Of those women allocated to the intervention, 306 completed the trial protocol compared with 294 of those women allocated to the control treatment. Analysis was by intention to treat. The risk of injurious falls was significantly reduced in the intervention group when compared with the control group (hazard ratio 0.81, 95% confidence interval 0.67 to 0.99). At two years, women in the intervention group performed significantly better on all physical tests and had significantly better perception of their overall physical function than women in the control group. It was concluded that the exercise programme was effective in reducing the risk of injurious falls, and in improving measured and perceived physical function in women aged 75-85 years at risk of falling.

Which of the following statements, if any, are true?

a) The random allocation of the women to treatment group minimised confounding

b) Stratifying the random allocation of women controlled for the effects of study centre and body weight as potential confounders

c) The trial was prone to attrition bias

d) Intention to treat analysis minimised the effects of confounding

Submitted by Philip Sedgwick
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CASE SCENARIO

An unusual cause of headache in pregnancy

A pregnant 35 year old woman with known migraines presented with severe headaches. Magnetic resonance imaging showed an enlarged sella turcica containing a macroadenoma with a fluid-fluid level. Signal characteristics were consistent with subacute haemorrhage within the pituitary adenoma.

Pituitary apoplexy is a medical emergency caused by haemorrhage or infarction (or both) of the pituitary gland.

Learning points:

• Pregnancy is a risk factor for pituitary apoplexy so this diagnosis should be considered in any pregnant woman presenting with acute severe headache or a major change in headache phenotype

• Corticosteroid replacement may be life saving

• Neurosurgical intervention should be considered in cases with persistent visual field defects or deteriorating level of consciousness

Submitted by Jonathan Bedford, Pooja Dassan, Miranda Harvie, and Sanjeev Mehta. Patient consent obtained.
Cite this as: *BMJ* 2015;351:h4681
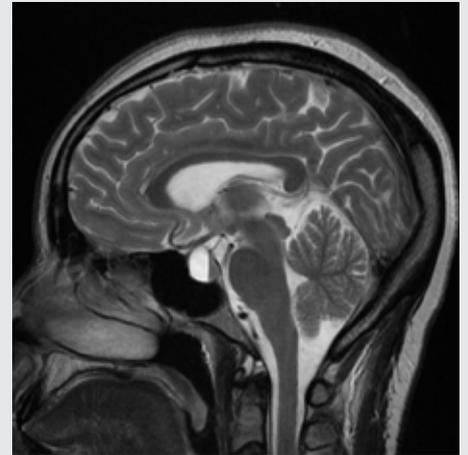
CASE REVIEW

Respiratory tract infection associated with seizures

A two year old girl presented to her local hospital with breathing difficulties. She was diagnosed with virus induced wheeze. On day one of admission she deteriorated and developed respiratory failure, which required ventilatory support and transfer to our paediatric intensive care unit. The figure shows her chest radiograph on arrival. A multiplex polymerase chain reaction (PCR) panel performed on respiratory secretions identified a micro-organism. She was successfully extubated to nasal cannula oxygen two days later and transferred to a paediatric ward. Four hours after transfer she had a prolonged tonic-clonic convulsion. Owing to profound respiratory depression after two doses of lorazepam she required re-intubation and transfer back to the paediatric intensive care unit.

1 What abnormalities can be seen on her chest radiograph?

2 What organism is most likely to be causing both her respiratory and neurological illnesses?

3 Which imaging studies would be the most useful in determining the cause of her neurological illness?

4 Which additional sample may help confirm the presumptive diagnosis?

Submitted by Nathan J Brendish, Sarah Williams, Saul N Faust, and Marc Tebruegge
Parental consent obtained.
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ANSWERS TO ENDGAMES, p 35   For long answers go to the Education channel on thebmj.com

CASE REVIEW
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1 Marked diffuse interstitial changes are present in the lung fields bilaterally. An endotracheal tube and a nasogastric tube are in place.

2 The most likely micro-organism is adenovirus, which is responsible for 5-15% of respiratory tract infections in children. Adenovirus can cause a variety of complications, including hepatitis, nephritis, and encephalitis.

3 Cranial magnetic resonance imaging (MRI) is the most appropriate investigation for presumed encephalitis.

4 A cerebrospinal fluid sample, which can be used to test for a range of viral pathogens by means of viral cultures or PCR.

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Statements *a*, *b*, *c*, and *d* are all true.