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

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CASE REVIEW

A woman with upper and lower airway symptoms

A 65 year old woman presented with a four week history of lethargy, cough, and feeling generally unwell. She had recently been treated for an ear infection and had occasional epistaxis but had no other medical history. She had never smoked. She did not have a fever. On examination she had crepitations in the base of her right lung. A chest radiograph showed right basal consolidation. Her blood tests showed: white blood cell count 17.5×10^9 cells/L (reference range 4-11), C reactive protein 3171 nmol/L (<47.6), urea 9.8 mmol/L (2.5-7.8), and creatinine 98 µmol/L (62-124). A diagnosis of community acquired pneumonia was made.

After seven days of treatment with antibiotics her symptoms had not improved. A repeat chest radiograph showed worsening bilateral inflammatory changes. Sputum and blood cultures were negative, as were tests for *Legionella* and *Pneumococcus* urinary antigens. Urine dipstick was positive for blood. At bronchoscopy, bloodstained mucus was found within the airways. Bronchial washings were negative for cancer cells and pathogens.

Her renal function then deteriorated (urea 10.6 mmol/L, creatinine 178 µmol/L) and intravenous fluids were started. A further chest radiograph showed progression of the inflammatory changes and a new left pleural effusion. A contrast enhanced computed tomogram of the chest was considered but not performed owing to worsening renal function. Further blood tests showed that she was positive for cytoplasmic antineutrophil cytoplasmic antibodies (c-ANCA).

1 What is the likely diagnosis?
2 What history or examination findings might have suggested the diagnosis?
3 How is this diagnosis confirmed?
4 How should this patient be managed once the diagnosis is confirmed?

Submitted by Jennifer Capps, Constantina Chrysochou, and William Flight

Patient consent obtained.

Cite this as: *BMJ* 2015;350:h2708

STATISTICAL QUESTION

A comparison of sampling error and standard error

The impact of a diet and physical activity programme on body weight in overweight or obese people initiated through a national colorectal cancer screening programme was investigated. A multicentre randomised controlled trial was performed. The intervention consisted of a personalised, behaviourally focused weight loss programme, delivered over 12 months. The control treatment consisted of a weight loss booklet only. Participants were overweight or obese adults (aged 50-74 years) who had undergone colonoscopy after a positive faecal occult blood test result and had a diagnosis of adenoma confirmed by histopathological examination. In total, 329 participants were recruited and randomised to the intervention (n=163) or control (n=166).

The primary outcome was weight change over 12 months. At follow-up, data were available on the primary outcome for 148 (91%) participants in the intervention group and 157 (95%) in the control group. At 12 months, mean weight loss was 3.50 kg (95% confidence interval 2.70 to 4.30; standard error 0.40) in the intervention group compared with 0.78 kg (0.19 to 1.38; 0.30) in the control group. The intervention group lost significantly more weight (mean difference 2.69 kg, 1.70 to 3.67; P<0.001). It was concluded that significant weight loss can be achieved by a diet and physical activity intervention initiated within a national colorectal cancer screening programme in older adults, offering considerable potential for reducing the risk of disease.

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

a) The sample estimates were prone to sampling error
b) Sampling error would have occurred as a result of taking a sample from the population
c) The standard error of the mean weight loss for a treatment group provided a measure of the accuracy of the sample mean as an estimate for the population parameter
d) Generally, the size of the standard error for a treatment group would be expected to increase if sample size increased

Submitted by Philip Sedgwick

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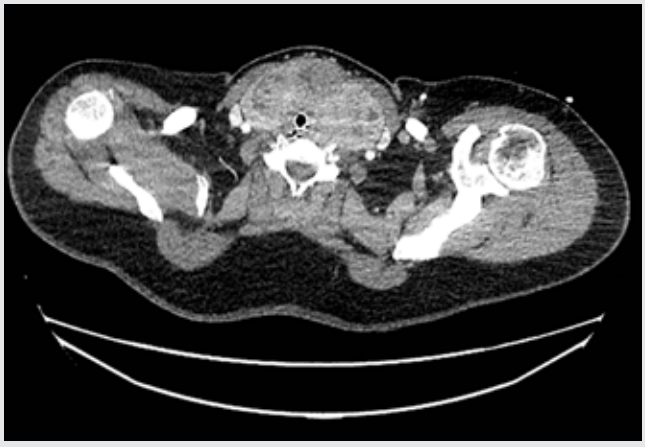
SPOT DIAGNOSIS

An occult cause of dyspnoea

A 69 year old man presented with severe dyspnoea. After respiratory arrest and emergency intubation, computed tomography of the neck was performed (figure). What is the diagnosis based on the results of computed tomography?



Submitted by Anthony Simon Bates and Salem Al-Hamali

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CONTRIBUTIONS

We welcome all contributions to the Endgames section. See online for our new article styles.
Longer versions are on the Education channel on thebmj.com.
Please submit via thebmj.com or contact Amy Davis at adavis@bmj.com

ANSWERS TO ENDGAMES, p xx

For long answers go to the Education channel on thebmj.com

CASE REVIEW

A woman with upper and lower airway symptoms

1 Granulomatosis with polyangiitis (previously known as Wegener's granulomatosis), a small vessel vasculitis that predominantly affects the kidneys and respiratory tract. Other possible differentials (before the positive cytoplasmic antineutrophil cytoplasmic antibody (c-ANCA) result) included atypical pneumonia, a complication of pneumonia, or another diagnosis such as pulmonary embolus or cancer.

2 Systemic features of granulomatosis with polyangiitis include fever, malaise, and anorexia. Focal symptoms tend to present in the ears, nose, respiratory tract, and urine. This patient had ear problems, recent episodes of epistaxis, changes on chest radiography, blood stained sputum, and haematuria on dipstick testing.

3 Biopsy of affected tissue, with identification of the disease process, such as necrotising glomerulonephritis on a renal biopsy, is needed to confirm the diagnosis.

4 Immunosuppression (usually with steroids and either cyclophosphamide or rituximab) and supportive management, which may include haemodialysis. Prevention and management of treatment related complications is also important.

SPOT DIAGNOSIS

An occult cause of dyspnoea

The diagnosis is compressive cervical goitre.

STATISTICAL QUESTION

A comparison of sampling error and standard error

Statements *a*, *b*, and *c* are true, whereas *d* is false.