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STATISTICAL QUESTION
Selection bias versus allocation bias

The effectiveness of supported self management in reducing hospital readmissions and death in patients with chronic obstructive pulmonary disease was evaluated. Researchers performed a randomised controlled trial. The intervention consisted of training patients to detect and treat exacerbations promptly, with ongoing support for 12 months. Patients in the control group continued to be managed by their general practitioner, hospital based specialists, or both.

Participants were patients admitted to one of six hospitals in the west of Scotland with an acute exacerbation of chronic obstructive pulmonary disease. In total, 464 patients were recruited and allocated to the treatment group using stratified randomisation based on demographic and disease severity factors. The main outcome measures included time until first hospital readmission or death owing to chronic obstructive pulmonary disease. The researchers reported that supported self management had no effect on time to first hospital readmission or death from chronic obstructive pulmonary disease.

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

a) The method of patient recruitment meant there was the potential for selection bias
b) Selection bias would result if patients were selected for treatment groups on the basis of a preference by one of the researchers
c) The randomisation of patients to treatment group minimised allocation bias
d) The randomisation of patients to treatment group minimised selection bias

Submitted by Philip Sedgwick

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CASE REPORT
A man with bilateral loin pain

A 65 year old man presented with a 12 month history of bilateral flank pain but no fever or lower urinary tract symptoms. Over the preceding 10 years he had had multiple interventions, including extracorporeal shock wave lithotripsy and ureteroscopic laser stone fragmentation, for cystine renal stones. He had type 2 diabetes and hypertension, and he was also obese.

A plain radiograph showed a large renal pelvic calculus measuring 3.4 cm in the right kidney and a 4.4 cm partial staghorn calculus projected over the left kidney. A dimercaptosuccinic acid scan showed a relative function of 47.5% for the right kidney and 52.5% for the left kidney.

A staged percutaneous nephrolithotomy was performed successfully on the simpler right stone, but postoperatively he developed pain in the right loin. A nephrostogram showed debris partially occluding the right ureter, which resulted in a filling defect; this was thought to be a clot and it later passed. Stone analysis confirmed cystine stones. Three months later a percutaneous nephrolithotomy was undertaken on the left side. Postoperative recovery was uneventful and radiography showed no residual stones.

1 What is the most common clinical presentation of renal tract stones?
2 What are the causative factors for renal tract stones?
3 What are the causes of loin pain and what investigations are used to differentiate them?
4 What is the best management approach for staghorn calculi?

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PICTURE QUIZ The acute abdomen

A 45 year old woman presented to the emergency department with an eight hour history of sudden onset abdominal pain. The pain was severe, sharp, and worse on movement. She felt nauseous but had not vomited. She had last opened her bowels earlier that day, passing a small amount of hard stool. Her medical history included osteogenesis imperfecta, which caused hip pain, and for which she took 140 mg of oxycodone daily.

On examination she was in obvious distress. She was tachypnoeic at 22 breaths/min and tachycardic at 110 beats/min. Blood pressure, peripheral oxygen saturation, and temperature were all in the normal range. Her abdomen was exquisitely tender to palpation, with maximum tenderness in the right iliac fossa, localised guarding, and percussion tenderness. Digital rectal examination identified hard faeces in the rectum. Bowel sounds were absent. Initial blood tests showed haemoglobin 14.5 g/L (reference range 12.0-15.0), white cell count 17.5×10^9/L (4.0-11.0), C reactive protein 5.5 mg/L (0-8). Urea, electrolytes, and liver function tests were normal. A venous blood gas showed a raised lactate of 4.2 mmol/L (0.5-2.0; 1 mmol/L=9.01 mg/dL). Urgent chest radiography (in the erect position) was performed (figure).

1 What abnormality is apparent on the erect chest radiograph?
2 What is the sensitivity of this radiological sign?
3 What is the differential diagnosis?
4 What immediate management should be implemented for this patient?
5 What definitive treatment options should be considered?

Submitted by B H van Duren, M Moghul, S G Appleton, and G I van Boxel

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