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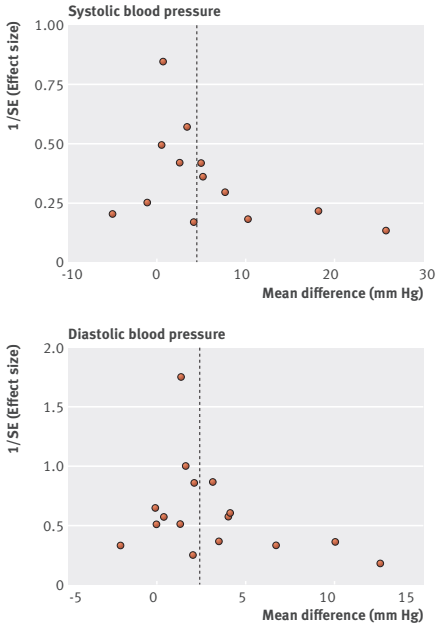
STATISTICAL QUESTION

How to read a funnel plot in a meta-analysis

Researchers undertook a meta-analysis of the effects of home blood pressure monitoring on blood pressure levels. Randomised controlled trials were included if home or "self" monitoring was compared with standard monitoring in the healthcare system. Participants were patients with essential hypertension, followed for two to 36 months. The main outcomes included measurements of systolic and diastolic blood pressure and the achievement of hypertension targets.

Eighteen trials were eligible for inclusion. When the results of the trials were combined, home monitoring resulted in significantly lower systolic blood pressure than standard monitoring (mean difference 4.2 mm Hg, 95% confidence interval 1.5 to 6.9) and significantly lower diastolic blood pressure (2.4 mm Hg, 1.2 to 3.5). Home monitoring patients were more likely to achieve predetermined targets (relative risk 1.11, 1.00 to 1.11). The researchers presented funnel plots for the outcomes of systolic and diastolic blood pressure (figure). Egger's test gave P=0.038 for systolic blood pressure and P=0.095 for diastolic blood pressure.



Funnel plots for the meta-analysis of the effects on blood pressure of home monitoring compared with standard monitoring in the healthcare system

It was concluded that home monitoring results in lower blood pressure than standard monitoring. Although the difference in blood pressure between the two methods was small it may contribute to an important reduction in vascular complications in the hypertensive population.

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

a) Failure to include in the meta-analysis all of the relevant trials that have been conducted may have been due to reporting bias

b) A funnel plot can suggest whether relevant trials were not included in the meta-analysis only as a result of publication bias

c) The funnel plots for systolic and diastolic blood pressure indicate that not all of the relevant trials that have been conducted were identified

d) The result of Egger's test indicates that asymmetry exists in the funnel plot for the outcome of systolic blood pressure

Submitted by Philip Sedgwick and Louise Marston
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CASE REVIEW

A 22 year old woman with bilateral panuveitis and parotid swelling

A 22 year old white woman presented with a three month history of bilateral red eyes and severely reduced vision in her left eye. The vision loss had occurred a few weeks before presentation. She had recently seen her general practitioner because of weight loss and facial swelling, and had been experiencing night sweats and reduced exercise tolerance related to fatigue.

Before this presentation she had been well. She was a non-smoker and worked as a hairdresser. She had no pets, no recent travel history, and no other history of note. On examination she was thin and pale and her best corrected Snellen visual acuity was 6/5 on the right and 3/60 on the left. Slit lamp examination showed bilateral panuveitis (inflammation in anterior and posterior segment). Her parotid glands were bilaterally enlarged and two small volume cervical nodes were palpable on the right. A cardiac, respiratory, neurological, skin, and joint examination was unremarkable. A recording of her vital signs included: respiratory rate 16 breaths/min, peripheral capillary oxygen saturation 99% on air, and temperature 36.8°C.

The results of a full blood count, electrolytes, liver function tests, erythrocyte sedimentation rate, C reactive protein, thyroid stimulating hormone, glucose, lipids, and bone profile were available from her GP and were all within normal ranges. A Paul Bunnell test was negative. Chest radiography was also performed (figure).

1 What abnormality does the chest radiograph show?

2 What are the differential diagnoses and the most likely diagnosis?

3 How would you investigate this patient further to establish the diagnosis?

4 How would you manage this patient?

Submitted by James Lowe, Ben Whatley, Shahram Kashani, and David Howlett
Patient consent obtained.
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