

Deacon's Challenge

No. 39 Answer

A 33 year old woman investigated for subfertility had a mildly elevated serum prolactin level varying between 800 and 1400 mIU/L on three occasions over three months. The next specimen received in the laboratory a year later gave a prolactin result of 1900 mIU/L (Bayer Centaur ref range 59-619). The possibility of macrolprolactin was considered.

250 μ L of serum was mixed with 250 μ L polyethylene glycol (PEG 6000), centrifuged at 3000 rpm for 30 min and the supernatant re-analysed, the result being compared to a 1:1 dilution in Centaur diluent.

The result following PEG treatment was 354 mIU/L. The result of the diluted specimen was 948 mIU/L.

Calculate the recovery of prolactin in the presence of PEG and comment on the result.

MRCPath, May 2003

$$\begin{aligned}\text{Recovery (\%)} &= \frac{\text{Result for supernatant following PEG precipitation}}{\text{Result for similar dilution with diluent}} \times 100 \\ &= \frac{354}{948} \times 100 = 37\%\end{aligned}$$

This low recovery indicates that macrolprolactin is a major component of the serum prolactin. The non-precipitated result (354 mIU/L) can be multiplied by 2 to give the monomeric form ($2 \times 354 = 708$ mIU/L) but this is likely to be an underestimate. There are concerns that some monomeric prolactin precipitates with PEG giving artefactually low recoveries; gel filtration chromatography is the preferred technique. The concentration of the monomeric form can be estimated from the known relationship between PEG precipitation and gel filtration chromatography. ■

Question 40

The SHO in ITU carried out a blood gas analysis but failed to record all of the results in the patient's notes. The only available results are:

H ⁺ concentration	=	93 nmol/L
Standard bicarbonate	=	15 mmol/L
Actual bicarbonate	=	21 mmol/L

Calculate the pH and PCO_2 (in kPa). Assume the solubility coefficient of CO_2 (in kPa) is 0.225.