JOURNAL-BASED LEARNING EXERCISES

Each article's contents should be read, researched and understood, and you should then come to a decision on each question. The pass mark is 17 out of 20 questions answered correctly. JBL exercises may be completed at any time until the published deadline date. Please select your choice of correct answers and complete the exercises online at: **www.ibms.org/cpd/jbl**

DEADLINE WEDNESDAY 4 JULY 2018

Uncertainty of measurement in andrology: UK best practice guideline from the Association of Biomedical Andrologists. Sanders D, Fensome-Rimmer S, Woodward B. *Br J Biomed Sci* 2017; **74** (4): 157–62. Assessment No 041118

01	By understanding the uncertainty associated with a given value, as measured by andrologists, we are better placed to determine how close the measured value is likely to be to the actual value.
02	Type A uncertainties are heuristics, or uncertainties that do not have a numerical value assigned to them.
03	Seminal fluid lacks homogeneity and is classed as a heterogenous biological fluid.
04	The semen analysis report summarises a group of individual tests to provide an indication of the fertility potential for an individual.
05	According to World Health Organization guidelines, semen analysis should begin no longer than 10 hours after ejaculation.
06	When considering calibration of equipment, it is imperative that the calibration covers the full working range of the equipment.
07	Assessment of semen volume can be performed only by volumetric assessment using a serological pipette.
08	The accuracy of a serological pipette is determined at a specified temperature, normally 37°C.
09	It may be considerably more difficult to assess the volume of a highly viscous sample, compared to a low-viscosity sample.
10	Once loaded, a haemocytometer should be allowed to settle sufficiently in a moist environment, to enable the sperm to be easily counted.
11	The Improved Neubauer haemocytometer is considered the "gold standard" for the assessment of sperm concentration.
12	Sperm motility is not affected by fluctuations in temperature but does start to decline from the moment of ejaculation.
13	Use of a heated microscope stage, when used correctly and independently verified to ensure the sample is assessed at 37°C, is an effective way of ensuring that all samples are assessed at a constant temperature.
14	Morphology assessment is considered to be an objective part of semen analysis.
15	To prevent fixed morphology slides from deteriorating, they should be mounted and stored in the dark.
16	Preparation of the dilution requires the use of two different micropipetters: an air displacement micropipetter to sample the semen, and a positive displacement micropipetter to measure the diluent.
17	Modern computer-assisted semen analysis is now regarded as an alternative to skilled and experienced andrology staff.
18	Uncertainty factors in the examination phase of semen analysis include verification, validation and documentation.
19	As part of the sample collection process, the laboratory should have a procedure to ensure that the patient has understood and complied with the instruction.
20	Losing the first portion of the ejaculate has less influence on the results of semen analysis than does losing the last portion.

Role of miR-29 as marker of risk of acute rejection after heart transplant. Guo S, Guo X, Wang S, Nie Q, Ni G, Wang C. *Br J Biomed Sci* 2017; **74** (4): 187–92. Assessment No: 041218

01	Up to 50% of heart transplant recipients experience a rejection episode during the first year.
02	Measurement of N-terminal pro-B-type natriuretic peptide (NT-proBNP) or C-reactive protein (CRP) is effective in predicting acute cellular rejection.
03	Circulating miRNAs are stable to RNase digestion, but are damaged by repeated freeze-thawing and other harsh conditions.
04	A total of 506 stored blood samples from 1824 transplant cases were analysed in this study.
05	Endomyocardial biopsies were graded according to the International Society for Heart and Lung Transplantation (ISHLT) 2004 revised grading scale.
06	Heparinised plasma samples were stored at –20°C after centrifugation prior to being analysed.
07	Serum NT-proBNP levels were determined using the commercially available Elecsys proBNP sandwich electrochemiluminescence immunoassay on an Elecsys 2010 analyser.
08	Mild cellular rejection and moderate to severe acute cellular rejection represented 51/506 (10%) and 224/506 (44.2%) of patients, respectively.
09	miR-29 was measured at specific time points after transplantation in accordance with the predefined biopsy protocol.
10	The positive predictive value (PPV) of serum miR-29 to diagnose R0, R1 and R2/R3 was 87.4%, 84.6% and 71.8%, respectively.
11	Serum miR-29 level after heart transplant negatively correlated with rejection score, cTnI, NT-proBNP and WBC counts.
12	In the study by Arora *et al.* the median value of cTnI was lower in patients with acute rejection than that in patients without acute rejection.
13	Arnold *et al.* reported that immunosuppressant rapamycin treatment increased the expression of cardiac miR-29 family miRNAs in ZDF rats.
14	In routine clinical practice, rejection scores ≥2R usually lead to a treatment intervention.
15	Creatinine (Cr) level showed a strong association with miR-29.
16	Non-ischaemic cardiomyopathy was the indication for cardiac transplantation in 190 cases in this study.
17	Both donor and recipient were cytomegalovirus serology positive in 152 cases in this study.
18	MicroRNAs (miRNAs) are non-coding RNAs of 19–25 nucleotides that recognise complementary mRNAs.
19	Of the 3544 biopsies studied, 41% showed no evidence of cellular rejection.
20	Serum miR-29 levels correlate positively with time after transplant, and negatively with the grades of risk of acute rejection.

REFLECTIVE LEARNING

01	The responsibility for semen analysis is undertaken by different pathology specialties across the country. How does your laboratory's practice compare with the Association of Biomedical Andrologists' guideline?
02	Discuss the use of computer-assisted semen analysis. Are there any disadvantages to its implementation in a routine pathology laboratory?

01	MicroRNAs regulate gene expression post-transcriptionally, and have been studied as biomarkers in the assessment of solid organ transplantation. Discuss their application in the monitoring of kidney transplant recipients.
02	Discuss the role of cardiac markers other than miR-29 in post-transplant surveillance.