JOURNAL-BASED LEARNING EXERCISES

Institute of Biomedical Science Continuing Professional Development

Please select your choice of correct answers and complete the exercises online at: **www.ibms.org/cpd/jbl**

DEADLINE WEDNESDAY 7 OCTOBER 2020

Predicting hepcidin level using inflammation markers and iron indicators in patients with anemia of chronic disease.
Suega K, Widiana GR. *Hematol Transfus Cell Ther* 2019; **41** (4): 342–8.
Assessment No: 070320

01	Anaemia of chronic disease (ACD) presents with a normal or increased level of ferritin.	11	Anaemia of chronic disease always presents as a normochromic normocytic anaemia.
02	Chronic kidney disease (CKD) is an inflammatory disease.	12	Hepcidin is a steroid hormone.
03	Hepcidin increases the availability of iron for erythropoiesis.	13	Stepwise regression shows that IL-6, ferritin and creatinine correlate significantly with hepcidin levels.
04	Hepcidin synthesis is regulated by interleukin (IL)-6 levels.	14	Anaemia of chronic disease is characterised by falling RBC production.
05	The influence of iron status on hepcidin levels is increased during the inflammation process.	15	Tumour necrosis factor-alpha (TNFα) antibody and anti-IL-6 receptor antibody therapy increase C-reactive protein (CRP) levels.
06	Ferroportin is the only receptor for hepcidin.	16	The mathematical model reported can predict 65% of hepcidin levels.
07	Hepcidin levels are increased in all infections.	17	Increased hepcidin secretion inhibits duodenal iron absorption.
08	The results of this study show a strong negative correlation between hepcidin and ferritin levels.	18	In inflammation, most of the circulating ferritin is released by the liver.
09	Kidney disease affects hepcidin levels due to decreased renal clearance of pro-inflammatory cytokines.	19	Hepcidin has antimicrobial properties.
10	Serum iron and transferrin saturation correlate with hepcidin levels.	20	Patients with ACD have increased levels of iron.

REFLECTIVE LEARNING

01	Which investigations are currently used in your hospital to make a diagnosis of ACD?	02	Could measurement of serum hepcidin levels contribute towards the differential diagnosis of anaemia?

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Measurement and interpretation of *Salmonella typhi* Vi IgG antibodies for the assessment of adaptive immunity.
Parker AR, Bradley C, Harding S, Sánchez-Ramón S, Jolles S, Kiani-Alikhan S. *J Immunol Methods* 2018; **459:** 1–10 (www.sciencedirect.com/science/article/pii/S0022175917304544). Assessment No: 070520

01	ViCPS vaccines are currently not licensed for use in adults and children over two years old, but are used in areas where typhoid fever is endemic, as well as for travellers to those areas.	**11**	Impairment of specific antibody responses is characteristic of a number of humoral immunodeficiencies, rendering individuals susceptible to recurrent and severe infections with encapsulated bacteria as well as rare opportunistic pathogens.
02	ViCPS is a linear homopolymer of poly-alpha (1.4)GalNA*cp* whose immunogenicity, in the organism *Salmonella typhi*, may depend on pre-translation modification.	**12**	Purified Vi antigen is a potent immunogen and hence a prime target for vaccine development against typhoid fever.
03	The clinical measurement of T-cell-independent immunity can be achieved by measuring the antibody response to several polysaccharide antigens.	**13**	The antibody response to ViCPS vaccination generates antigen-specific plasmablasts.
04	The measurement of IgM response to polysaccharide vaccines has been suggested as additional tools to assess humoral immunity.	**14**	Global baseline Typhi Vi IgG concentrations will likely remain relatively low since administration of the conjugate vaccine will only be directed towards countries with endemic typhoid fever and individuals travelling to them.
05	The comparison between children and adult responses in a healthy population has been demonstrated by Kumarage *et al.*; a lesser response was elicited in the paediatric group compared with the adult group, but it did not reach statistical significance.	**15**	The IgG response to ViCPS vaccine may be defective in patients with primary antibody deficiencies.
06	Independent studies have reported low baseline concentrations of Typhi Vi IgG antibodies in children and adult blood donors (median children 11.4 AU/mL, median adults 15.3 AU/mL).	**16**	A lower post-vaccination concentration was reported where typhoid fever is endemic.
07	It is essential that vaccines used in the diagnosis of antibody deficiencies are able to induce responses in healthy individuals that are relatively stable for at least a year post-vaccination.	**17**	Guidelines have suggested measuring the response to two protein vaccines for the assessment of antibody deficiency.
08	Infants are unable to mount polysaccharide-specific responses before the age of two years.	**18**	Kroon and colleagues demonstrated that the response to Typhim Vi is compromised in individuals infected with HIV.
09	In patients undergoing immunological evaluation, the responses to Typhim Vi and Pneumovax 23 can divide the patients into three groups.	**19**	Poor IgM responses to pneumococcal antigens in patients with antibody deficiencies has been associated with increased risk of infections and co-morbidities.
10	Sánchez–Ramón and colleagues proposed that differentiation of CVID patients using a five-fold increased cut-off may identify a subset of CVID patients.	**20**	Two main types of typhoid vaccines are currently available: ViCPS vaccines and a live-attenuated oral vaccine that contains the *Salmonella typhi* strain (Ty12a).

REFLECTIVE LEARNING

01	Discuss the utility of protein and polysaccharide vaccines for the evaluation of the immune system in patients suspected of having primary immunodeficiency.	**02**	Compare and contrast the use of Typhim Vi and Prevenar vaccine for investigation of immunodeficiency.