

EDITORIAL

A Glimpse of New Diagnostic Laboratory Tests

Umer Saeed Ansari; MBBS, M.Phil, PhD

Medical laboratories perform numerous *in vitro* diagnostic tests for the diagnosis and prognosis of a variety of diseases. There are some well renowned medical laboratories in Pakistan performing a spectrum of advanced diagnostic tests. This editorial provides a glimpse of few advanced laboratory tests with diagnostic significance.

Calprotectin (detected in stools): Calprotectin is a protein released by neutrophils, & its presence in the stool is indicative of inflammation in the intestines; its detection also enables to distinguish between inflammatory bowel disease & non-inflammatory bowel conditions, thus also estimated to monitor Ischemic Bowel Disease (IBD) activity, or Irritable bowel syndrome (IBS)

High fecal concentration of calprotectin is suggestive of Crohn's disease, Ulcerative colitis, Colon carcinoma or Colitis due to other causes. In year 2021, a research study was conducted to determine the diagnostic accuracy of fecal calprotectin concentration in evaluating the therapeutic outcomes of patients with Ulcerative Colitis¹. The study concluded that fecal calprotectin concentration can be used to distinguish patients with current microscopic inflammation of intestines from patients with histological remission of inflammation

Interpretation:

- **If normal range** = GIT inflammation ruled out, therefore, further investigations not required
- **If slightly high levels** = low state of inflammatory activity in the GIT. If required, the test can be repeated. Further investigations required if clinical suspicion of intestinal inflammation persists
- **If significantly elevated** = active organic disease of the GIT, further diagnostic tests for confirmation required (such as colonoscopy, biopsies) and specific treatment is required

Procalcitonin: (PCT; detected in serum): Procalcitonin (PCT) is a 116 amino acid protein precursor of calcitonin hormone, and serves as a useful bio marker of disease severity in a variety of disorders such as septicemia, meningitis, pneumonia, urinary tract infections, fungal & parasitic infections. Although serum Procalcitonin concentration rises in bacterial infections but the levels remain low in most of the viral infections, thus making PCT a potentially useful marker for distinguishing between bacterial and viral infections.

Normal range: Males; less than 0.08ng/dl and in females; less than 0.05ng/dl

Recently, during Covid 19 pandemic, the estimation of PCT served as a useful tool for assessment of severity of disease and poor prognosis in critically ill patients². The study conducted on 56 critically ill patients with covid 19 infections, admitted in ICU highlighted higher mortality in these patients with high plasma levels of PCT.

Interpretation and clinical significance; PCT is estimated for the diagnosis of lower respiratory tract infections. If the value is less

than 0.1ng/dl, then it is indicative of absence of respiratory tract infection

- If the value is greater than, or equal to 0.25ng/dl, then the use of antibiotic should be discouraged
- If the value is greater than, or equal to 0.25ng/dl, but less than 0.5 ng/dl, then bacterial infection is likely present, and the use of antibiotic treatment is recommended
- If the value is greater than 0.5ng/dl (antibiotic treatment strongly recommended)
- Bacterial infection possible; Suggestive of bacterial infection;

Diagnosis of systemic bacterial infection or generalized sepsis:

- Systemic infection unlikely; less than 0.5ng/dl
- Systemic infection possible; greater than 0.5 but less than 2ng/dl
- Systemic infection unlikely; greater than 2 but less than 10ng/dl
- Severe sepsis or septic shock likely; greater than 10 ng/dl

Quantiferon TB gold plus: Diagnosing or excluding TB and assessing the possibility of latent TB infection requires a combination of epidemiological, historical, medical & diagnostic findings which should be taken into account when interpreting QFT-TB GOLD PLUS results. The specificity of this analysis is broadly evaluated in adults worldwide with approximately 90% specificity in patients with tuberculosis

In a systematic review in 2021, the Quantiferon TB Gold test was compared with other latent tuberculosis infection tests, and the study concluded significantly better diagnostic performance of Quantiferon TB Gold Test³.

Interpretation; Test is positive, if greater than 0.35 (M. tuberculosis infection likely).

Test is negative, if less than 0.35 (TB not likely, but cannot be excluded)

REFERENCES

1. Toer W. Stevens, Krisztina Gecse, Jerrold R.Turner, Gertde Hertogh, David T. Rubin, and Geert R.D'Haens. Clinical Gastroenterology and Hepatology. Volume 19, Issue 11, November 2021; 2333-2342
2. Pedro Garrido, Pitter Cueto, Conxita Rovira, Elisabet Garcia, AnaParra, Raquel Enriquez, Armando Pinos, Manuel Sosa, Anna Hernández-Aguilera, Immaculada Vallverdú. The American Journal of Emergency Medicine. Volume 46, August 2021; 525-531
3. Chi Eun Oh, Edgar Ortiz-Brizuela, Mayara L Bastos, Dick Menzies. Comparing the Diagnostic Performance of QuantiFERON-TB Gold Plus to Other Tests of Latent Tuberculosis Infection: A Systematic Review and Meta-analysis. *Clinical Infectious Diseases*, Volume 73 (5), September 2021, e1116-e1125.