

Performance of Fecal Leucocyte Test in Predicting Infection in the Gastrointestinal Tract of Children

Badriul Hegar

Department of Child Health, Faculty of Medicine, Universitas Indonesia/
Dr. Cipto Mangunkusumo General National Hospital, Jakarta

Gastrointestinal tract infections in children are still a major problem in some developing countries, including Indonesia. The problem is primarily in establishing early diagnosis and providing rational therapy. Gastrointestinal infections caused by pathogenic bacteria must be adequately managed, since infections that cause loss of epithelial cell layer integrity, tissue damage, and inflammatory cell exudates are rapidly spreading resulting in systemic infection and sepsis, especially in younger children or infants.^{1,2}

Fecal cultures are still the gold standard to determine pathogens as causes of infectious diarrhea in children, however it may take several days to get the results, therefore it is constrained to take early diagnosis and promptly provide rational therapy.³ On the other hand, stool culture facilities are not available in all health care facilities in Indonesia, so getting the germs that cause gastrointestinal infections becomes impossible, therefore not infrequently the therapy given to be empirical with ineffective results.

The World Health Organization (WHO) recommends the use of fecal leukocyte as a tool to determine the presence of Shigella infection as pathogen bacterial in children with bloody diarrhea. WHO stipulates the number of fecal leukocytes above 10/LPB as a marker of gastrointestinal infection by pathogenic bacteria, and in areas with no fecal culture facilities can provide antibiotics according to existing sensitivity data. Studies for other pathogenic bacteria as a cause of gastrointestinal infections are still very limited, so this opportunity becomes a challenge for clinical practitioners especially for those who work in areas with limited laboratory facilities.⁴

Uncontrolled use of antibiotics in recent years has caused the pattern of bacterial sensitivity to change, as well as the disease progression and clinical symptoms shown to be non-specific. In clinical practice, it is often seen that clinical symptoms are severe enough, although the markers of inflammation or mucosal damage are moderate. This condition provides important information for a further study whether

pathogenic bacteria other than Shigella provide a pattern of mucosal damage or inflammation that is not the same, so antibiotic treatment need to be given earlier.

Limited study on bloody stools and stool leukocytes as an infectious diarrhea screening showed pathogenic bacterial infection in 70% of children with stool leukocytes >5/LPB. Another study shows the association of gastrointestinal infection by pathogenic bacteria with the numbers of stool leukocytes > 10/LPB. The presence of blood in the stool is strongly associated with fecal leukocytes > 10/LPB.^{5,6}

The study conducted by Nuraini et al showed the prevalent bacterial colitis infection in children with acute diarrhea of 6.82%, including strain EPEC of *E.coli* (16.67%), *Salmonella sp* (33.3%), *C. Difficile* (33.3%) and *Shigella sp* (16.67%). The leukocyte cutting point < 8/LPB and > 8/LPB was the best value, with a sensitivity value of 0.833 and a specificity of 0.549. Fecal leukocyte and fecal cultures examination showed an insignificant correlation in the diagnosis of bacterial infection colitis.⁷

The role of the number of fecal leukocytes and clinical appearance as a marker of gastrointestinal infection by pathogenic bacteria becomes a challenge for scientists to study, so that clinical practitioners in areas with limited laboratory support facilities can still provide health care based on scientific, rational, and cost effective evidence.

REFERENCES

1. Guandalini S. Acute diarrhea. Pediatric Gastrointestinal Disease. 4th ed. United States: BC Decker Inc 2004.p.166-76.
2. Oyofa BA, Lesmana M, Subekti D, Tjahjadi P. Surveillance of bacterial pathogens of diarrhea disease in Indonesia. Diagn Microbiol Infect Dis 2002;44:227-34.
3. Gogate A, De A, Nanivadekar R, Mathur M. Diagnostic role of stool culture and toxin detection in antibiotic associated diarrhea due to *Clostridium difficile* in children. Indian J Med Res 2005;Dec:518-24.
4. World Health Organization. Diarrhoeal Treatment Guidelines. Geneva: World Health Organization 2009.p.1-46

5. Huicho L, Sanchez D, Contreras M, Paredes M. Occult blood and fecal leucocytes as screening test in childhood infectious diarrhea: an old problem revisited. *Pediatr Infect Dis J* 1993;12:474-7.
6. Mercado EH, Ochoa TJ, Ecker L, Cabello M, Durand D. Fecal leukocytes in children infected with Diarrheagenic *Escherichia coli*. *J Clin Microbiol* 2011;49:1376-81.
7. Nuraini IN, Reynaldo, Kekalih A, Karuniawati A, Hegar B. Microscopic examination of fecal leucocytes as a simple method to detect infective colitis in children. *Indones J Gastroenterol Hepatol Dig Endosc* 2017;18:73-9.