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Editorial

Leukocyte esterase reagent strips for Spontaneous Bacterial Peritonitis: what now?

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It has been more than thirty years since Harold Conn gave the name «spontaneous bacterial peritonitis» (SBP) to the dreaded and all too ominous complication of decompensated liver disease. From this initial step a great degree of clinical research has taken place, resulting in a very significant reduction in mortality rates from 90% to less than 20%.¹

Other pioneers in the field fought for years to establish the current practice of more liberal diagnostic paracentesis of ascites.² Current guidelines (American Association for the study of Liver Diseases and British Society of Gastroenterology) recommend performance of paracentesis in all cirrhotic patients with ascites admitted to hospital, and also in all patients who develop other signs suggestive of peritoneal infection i.e. encephalopathy, renal impairment and peripheral blood leucocytosis without a precipitating factor.^{3,4}

A polymorphonuclear (PMN) count of ≥ 250 cells/mm³ constitutes an indication for immediate antibiotic treatment. The PMN cell count is routinely performed (in most laboratories) with the traditional method i.e. with a light microscope in a manual counting chamber (Burker chamber), although that procedure is laborious and time consuming. Evidence is now available that automated blood cell counters provide results in good agreement with manually obtained measurements. Hopefully, their use gains ground in ascitic fluid PMN measurement.⁵

Whichever way your local laboratory works one thing is certain; the ascitic fluid analysis is by no means the first priority for the on-call technician whilst at the same time most junior clinicians underestimate its urgency.²

Other specialties, attracted by the possibility of an on-the-spot diagnosis, have for quite some time now used leukocyte esterase reagent strips (LERS) in the algorithmic approach to infections of the urinary tract, the pleural fluid and the cerebrospinal fluid. The relevant square of the strip (dipstick) contains an ester and the reaction is based on the esterase activity of activated PMNs.⁶ The possibility of reducing the aspiration-to-diagnosis time from a few hours to a couple of minutes make the dipsticks an attractive diagnostic tool. To date, 18 studies (published as full papers) have checked the validity of reagent strips in the diagnosis of SBP. A plethora of LERS came under scrutiny in one multi-centre and many single or two centres trials from around the world. Compared to the manual ascitic fluid PMN count, LERS were found to have sensitivity ranging from 45 to 100%; specificity ranging from 81 to 100%; positive predictive value (PPV) ranging from 42 to 100%; and negative predictive value (NPV) ranging from 87 to 100%.⁷ The latest of these, aimed to validate the use of the nitrite reagent as an additional tool of the same (LERS) armamentarium. The results though, as the authors expected and explain, were disappointing.⁸

The existing studies are free of major methodological flaws but the assessed heterogeneity does not allow for the pooling of data and meta-analysis. In the large multicenter (70 centres) study of Nousbaum *et al* a total of 2,123 paracenteses were performed.⁹ The LERS used showed a slim 45% sensitivity but a consistently (with previous single-centre studies) NPV of 97%. Undoubtedly, when it comes to life-threatening infections like SBP, high sensitivity of a diagnostic test is important.¹⁰ However, at the very least, a high NPV allows a further step forward in the diagnostic workup of the sick cirrhotic patient.

LERS testing of ascitic fluid is simple and inexpensive. It can be performed at the bedside and the results are available within a maximum of 2 min representing a useful test for practising physicians of smaller, less equipped/low-staffed units.¹¹ An effort should be placed in persuading companies to produce and validate a strip specifically for the ascitic fluid. This has the possibility

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of improving the interface between emergency departments and general medical wards, thus facilitating informed decision-making, timely antibiotic prescription and improved patient outcomes.

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