Correlation of Leukocyte Esterase Activity and Bacterial Isolation from Body Fluids

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We evaluated 230 body fluid samples, of which 131 were peritoneal effluents and 99 were other body fluids. Of these, 63 dialysates were culture positive, and 54 (85.7%) of these 63 were leukocyte esterase positive. Of 99 other body fluids, 8 were both culture positive and leukocyte esterase positive.

During the past several years, the leukocyte esterase test (LET) has been evaluated for use in the detection of pyuria (1). More recently, workers in our laboratory correlated LET results with cell counts in peritoneal fluid and cerebrospinal fluid (2). We determined that a 15-min LET was satisfactory in detecting inflammatory response suggestive of bacterial infection (4). To further define the use of the LET, the present investigation correlated the 1-min LET results with those of bacterial cultures of various body fluids.

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A total of 230 body fluid samples were evaluated, including 131 peritoneal effluent samples from continuous ambulatory peritoneal dialysis patients and 99 other body fluid samples, including: cerebrospinal fluid, 42; pleural fluid, 40; joint fluid, 11; pericardial aspirate, 3; and other body fluids, 3. The 1-min LET (Bio-Dynamics, a Boehringer Mannheim Co., Indianapolis, Ind.) was performed as previously described (3). Peritoneal effluents were cultured by using the pellet obtained after centrifugation of 50 ml of fluid at 3,000 rpm for 15 min. Pellets were inoculated onto blood, chocolate, and MacConkey agar and chopped meat and thioglycolate broth. Any cultural growth was considered significant within 72 h of incubation. The total volume of the other body fluids was centrifuged and plated as before, with any bacterial growth considered significant.

Among the 131 peritoneal dialysates, 63 had positive cultures, of which 54 (85.7%) were also LET positive. Of the nine dialysates that had positive cultures and a negative LET, six had small amounts of coagulase-negative staphylococci, one had a few Enterobacter agglomerans and Citrobacter freundii organisms, and one had numerous Pseudomonas vesicularis organisms. The clinical significance of these isolates was not determined in all cases; however, the isolation of P. vesicularis was not considered clinically significant by the attending medical staff. The E. coli isolate, on the other hand, was from a severe peritonitis case. In addition, nearly 60% of all peritonitis cases in ambulatory-dialysis patients are caused by gram-positive cocci (2); therefore, some of the coagulase-negative staphylococci isolates may have represented true infections.

The remaining 68 dialysates were culture negative, of which 43 (63.2%) were also LET negative. Twenty-five dialysates were LET positive and culture negative. However, several of these fluids were cultured after the initiation of antibiotic therapy, which could have interfered with the culture results. Also, ca. 20 to 30% of peritonitis cases with inflammatory response in ambulatory-dialysis patients have been reported not to have positive bacterial cultures (2).

Among the 99 other body fluid samples, 8 were both culture positive and LET positive, 7 were LET positive but culture negative, and the remaining 84 were negative by both culture and the LET.

In summary, the 1-min LET results correlated well with the isolation of bacteria from peritoneal effluents; the sensitivity was 85.7%. The LET may be considered a substitute for the cell count method before culture, with additional evidence. The LET had a sensitivity of 100% in correlating with the results of bacterial isolation from other body fluids and may prove to be useful after further evaluation.

LITERATURE CITED


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