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ORIGINAL TITLE	Rapid diagnosis of typhoid in a poorly resourced clinical microbiology Laboratory
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ABSTRACT	Four hundred adult patients from General Hospital, Kandy and Base Hospital, Trincomalee were studied for a one year period. But only 159 patients were included in the study because the others have not had confirmative alternative diagnosis. Whole blood, blood clot, urine and stool sample were obtained from patients for culturing. These patients were classified into 3 groups according to the clinical and laboratory findings. Group 01 comprised 30 patients ,,-ho .were definitively diagnosed as having typhoid/paratyphoid by isolation of Salmonella typhi or S. paratvphi A from blood. Group 02 consisted of 50 patients who had a strong presumptive diagnosis of typhoid, ie., a clinical illness suggestive of typhoid with an "O" antibody titre of >1/240 in the SAT and isolation of S .tvphi from urine. Group 03 included 79 patients whose blood culture was negative and had proven non - typhoidal illnesses in whom typhoid was considered in the differential diagnosis. An improved blood culture system was developed using Tryptone Soya broth-Sodium Polyanethol Sulphonate combination. Thirty eight S.tvphi and two S.paratvphi A were isolated from the patients' blood. S.typhi was also isolated from stool cultures of 4 patients and a urine culture of one patient. Antibody status of group 1, group 2 and group 3 were assessed by the single Widal tube agglutination test. Widal testas maximally efficient at "0" antibody titre of 1/480 and "H" antibody titre of 1/120. At "0" titre of 1/480 Widal test had sensitivity of 92.0per cent, specificity of 94.9per cent, positive predictive value of 85.1per cent, negative predictive value of 97.4per cent with efficiency of 94.2per cent. At "H" titre of 1/120 Widal test had sensitivity of 80.0per cent, specificity of 94.9per cent, positive predictive value of 83.3per cent, negative predictive value of 93.8per cent and efficiency of 91.3 per cent.Bacterial antigen detection was carried out by coagglutination (COAG) procedure from blood culture broth, clot culture broth, urine supernatant and serum in parallel to the routine cultures. In addition, COAG was done on 24 hour growth on Kligler Iron Agar (KIA) slopes. Twenty six out of 26 blood culture supernates (100per cent) became COAG positive 1 day before the presumptive blood culture results. Eighteen out of 18 clot cultures supernates (100per cent) supernates were positive by COAG 1 day before the presumptive clot culture results. None of the 30 non S.typhi and S.paratyphi A blood and/or clot culture isolates were positive with the COAG. Therefore, COAG is 100per cent sensitive, specific and rapid for identifying Salmonella typhi

in blood and clot cultures. Sixteen out of 28 urine samples (57per cent) in group 1, 37 out of 50 urine samples (74per cent) in group 2 and 23 out of 76 urine samples (30per cent) in group 3 became positive for COAG test but S.tvphi was isolated only in one urine sample belonging to group 1. Although Urine COAG has a relatively high sensitivity in groups 1 and 2, false positive reactions occurred all groups (1, 2 and 3) mainly from patients who had fever at the time of urine collection. This results indicate that something other than the presence of antigens of S.typhi or S.paratvphi A gave positive reaction. Further studies are necessary to eliminate the false positivity problem in order to improve the efficiency of this test in all 3 groups. The COAG test was not helpful in serum as all patients with typhoid gave negative results. 100per cent serological identification of all the 115 S.tvphi isolates and 05 S.paratvphi A isolates were made using COAG reagents. 134 non S. tvphi and S. paratvphi A enterobacteriaceae isolates were negative by COAG. The "0" antigen gave weakly positive results in 5 minutes with 9-0 coated COAG reagent. Ninety four out of one hundred and fifteen S.tvohi isolates (85.2per cent) were positive on direct testing. A further 14 out of twenty one (66.7per cent) required 50per cent ethanol treatment and the rest (33.4per cent) immersed in a boiling water bath for 10 minutes. d-H reaction were much stronger (2+) and appearing wi thin 2 minutes. The 5 strains of S. paratvohi A gave strong positive reactions for both "0" and "H'T antigens. Although COAG has been explored in the diagnosis of typhoid, its value in the Sri lankan diagnostic laboratory has not hitherto been tested. Although insensitive in antigen detection in serum, it appears to have a potential value in antigen detection in urine which needs further study. However, its main value at present could be its use in the laboratory both for early identification of positive cultures and for serological identification of likely isolates of S.typhi and S.paratyphi A.