EDTA IMPROVES THE CELL COUNT RESULTS IN THE LABORATORY DIAGNOSIS OF PD PERITONITIS

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INTRODUCTION

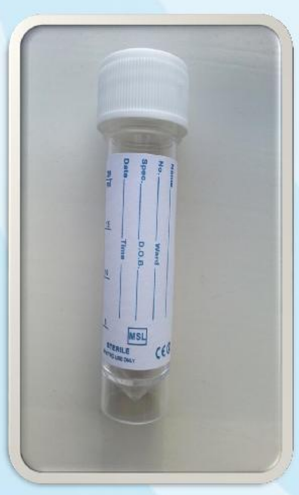
- Peritonitis remains a common complication of peritoneal dialysis (PD) and is associated with significant morbidity, catheter loss and transfer to haemodialysis.
- Patients with peritonitis usually present with abdominal pain and cloudy peritoneal effluent.
- A presumptive diagnosis is made if the peritoneal fluid yields a white cell count (WCC) >100 /mm³ and the percentage of neutrophils is > 50%. Diagnosis may be made in the presence of >50 % polymorphonuclear (PMN) cells independent of the absolute WCC among APD patients. Diagnosis of peritonitis is confirmed by a positive dialysate culture [1].
- Laboratory analysis can provide a total as well as a differential cell count (DCC), gram stain and culture for diagnosis of peritonitis from PD fluid sent in a universal container.
- Frequently PD fluids received in universal containers are clotted and therefore unsuitable for a cell count.
- Time delays in processing samples may lead to inaccurate results, since white cells degrade with time.
- Guidelines already recommend submitting ascitic fluid samples in ethylenediaminetetraacetic acid (EDTA) in order to perform cell count for the diagnosis of spontaneous bacterial peritonitis [2].
- A previous study has shown that leukocytes stability in dialysis effluents is increased when samples are drawn in tubes containing EDTA [3].

OBJECTIVES

- To compare the PD fluid DCC collected in universal containers and EDTA tubes.

METHODS

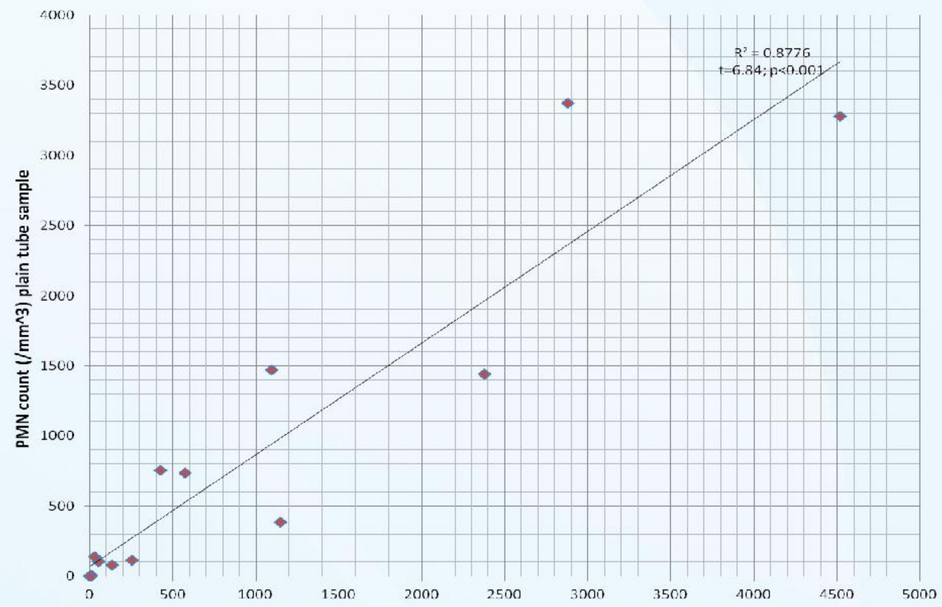
- The study was carried out between June 2013 and January 2014.
- Twenty PD fluid samples were collected in duplicate, both in a sterile universal container and an EDTA tube.
- 0.1% toluidine blue stain was added to 2-3 drops of the PD fluid sample to differentiate between neutrophils and other white cells.
- The cell counts were performed simultaneously on both types of specimens to provide a true comparison.
- Time delay in processing the specimens was recorded to evaluate its impact on the results.
- Gram stain and culture were only carried out on the centrifuged sterile universal container samples.
- Training of laboratory staff was straightforward.



RESULTS

- Of the 20 samples collected, 50% of specimens in the universal containers had a WCC of >100/ mm³.
- 4 out of the 20 samples (20%) were clotted and the cell count could be performed only from the EDTA specimen.
- Three out of the 4 showed a WCC of >100/ mm³.
- When the remaining (unclotted) 16 samples were compared with each counterpart, there was an average 14% increase in the PMN count in the EDTA compared to the universal sample.
- The PMN counts by the two methods showed a good correlation with an R^2 value of 0.88 ($p < 0.001$).

Comparison of peritoneal fluid PMN cell counts done on plain tube and EDTA tube samples (n=16)



CONCLUSION

- Out of all PD fluid samples submitted in universal containers for cell count in cases of suspected peritonitis, a significant proportion clot.
- Using specimen containers with EDTA may improve the diagnosis of PD peritonitis.
- This practice therefore may have an impact on the management of culture negative peritonitis.

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