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SHORT COMMUNICATION

Results of application of the ISPD guidelines to the management of peritoneal dialysis in a single center in Sudan

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Summary The culture negative peritonitis in Sudan 2010 was 46% exceeding 20% of the recommended ISPD (International Society for Peritoneal Dialysis) guidelines. This study reports an update after applying the standard ISPD protocol. The routine method was replaced by ISPD protocol. The culture negative rate using the ISPD guidelines dropped from 46% in the year 2010, to 39% in the year 2011, to 5% in the 2012 and to zero percent in the year 2013. Bacterial and fungal species represent (86.76%) and (13.23%) of infection and most isolates showed low resistance rate to antibiotics. Touch contamination added significantly ($p = 0.0006$) to the risk of contracting Peritonitis. The risk of contracting Peritonitis was 1.53 times higher in the group exposed by touch contamination. None of the other risk factors contributed significantly to Peritonitis. The study highlights the importance of implementing high hygiene practice.

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Introduction

Peritonitis and exit site infection represents an obstacle in the management of patients undergoing continuous ambulatory peritoneal dialysis (CAPD) [1] and stress the need for rapid and reliable diagnostic methods. The ISPD guidelines are developed to improve diagnosis [2]. CAPD was launched in Sudan as a national service in 2005. It is considered as an alternative method to hemodialysis treatment due to its low cost; require less dietary restrictions and not requiring a hospital/center care, as well as offering a better quality of life. A Peritonitis rate of 1 episode/14 month was reported in Sudan [3]. The rate of culture negative after lunching CAPD in Sudan in 2007 was 53% [3]. Obtaining a false negative result may be serious and cost the patient his life. That is why over the past few years the diagnostic tools were improved and the ISPD guidelines were implemented in our center, in an effort to reduce the culture negative rate. Based on this improvement we thought to analyze the current situation regarding the negative culture rate, causative agents and antimicrobial profile of microorganism isolated from patients undergoing CAPD in our peritoneal dialysis centers in Khartoum State, Sudan.

Material and methods

Study design

This retrospective cross-section study was conducted at a single PD center in Khartoum State, Sudan from January 2010 to December 2013. All the 53 patients undergoing CAPD are routinely given questionnaires by medical staff to identify predisposing factors for peritonitis. Data about causative agent, age, gender, predisposing factors for peritonitis and incidences of peritonitis and exit site infections were also analyzed.

Laboratory diagnosis

The diagnosis of peritonitis was based on the presence of abdominal pain, signs of peritoneal irritation and peritoneal fluid turbidity and effluent white blood cell count >100 cells/ml, with >50% neutrophils.

The previous protocol used from 2005 to 2010 consists of 10 ml withdrawn from peritoneal dialysis (PD) bags of patients. Samples were centrifuged at 3000 g for 10 min and deposit was inoculated directly onto MacConkey agar, blood agar and chocolate agar. From 2010, this protocol was modified by the ISPD guideline, whereas the peritoneal dialysis fluids were increased to 50 ml and centrifugation parameters were changed to 3000 g for 15 min. In addition to the use of brain heart infusion and Thioglycolate broth. Briefly, the dialysate bags were delivered to the laboratory immediately after the diagnosis of peritonitis case. A total white cell count was performed using an improved Neubauer ruled chamber. Differential white cell count was done. Fifty ml or more (maximum 100 ml) of the dialysate fluid was taken with a sterile syringe under aseptic conditions. This fluid was centrifuged in sterile container at rate of 3000 g for 15 min using (EBA 21 Hettich, Germany) centrifuge, the supernatant was discarded and the deposit was resuspended in 3—5 ml of dialysate fluid instead of the normal saline [2]. Then divided into three parts, the first part was used for direct smears, stained with Ziehl-Neelsen (ZN) and gram stain. The second part was inoculated into blood agar, chocolate agar in 5% CO_2 and MacConkey agar incubated at 37 °C for 24—48 h, in addition to Sabouraud-dextrose slopes incubated at 37 °C and examined daily for growth for up to 7 days. The third part was inoculated into brain heart infusion broth, Thioglycolate broth and incubated at 37 °C for 7 days. Exit site swab was taken with the presence of purulent discharge with or without the erythema of the skin [2]. Species identification performed using conventional phenotypic methods [4].

Susceptibilities to cefazolin, vancomycin, gentamicin, ciprofloxcin, amikacin, ceftazidime, and meropenem antibiotics were determined using a standard disc diffusion method (Kirby Bauer) according to the National Committee for Clinical Laboratory Standard [5].

Statistical analysis

Data are expressed as percentages for categorical variables and as mean ± standard deviation for continuous variables. For each risk factor the proportion test, as implemented in the function prop.test in S-Plus 8.2, was used for, to test if the factor increased the risk of contracting Peritonitis. *p*-Values less than or equal to 0.05 were considered statistically significant.

Results

The total number of patients receiving CAPD during January 2010 to December 2013 was 53 patients. 46 (86.7%) had a previous episode of