CONTINUOUS AMBULATORY PERITONEAL DIALYSIS USING STRAIGHT TYPE VS COILED TYPE TENCKHOFF CATHETER IN END-STAGE RENAL DISEASE PATIENTS AT SARDJITO HOSPITAL

[1]Eka Yudha Rahman, [2]Sungsang Rochadi, [2]Trisula Utomo.

[1]Department of Urology, Faculty of Medicine/Indonesia University, Cipto Mangunkusumo Hospital, Jakarta.
[2]Division of Urology/Department of Surgery, Faculty of Medicine/Gadjah Mada University, Sardjito Hospital, Yogyakarta.

ABSTRACT

Objective: *The purpose of this study was to compare straight type versus coiled type Tenckhoff catheter for continuous ambulatory peritoneal dialysis (CAPD) in end stage renal disease.* ***Material & method:*** *A prospective cohort study enrolled end-stage renal disease patients undergoing CAPD for renal replacement therapy in Urology and Nephrology Department, Sardjito Hospital from January to December 2007. Identity and type of Tenckhoff catheter were recorded. Patients were grouped into two groups who used straight type catheter and coiled type catheter for CAPD, then observed for post-operative complication. Statistical analysis was done using SPSS 14.0 with chi-square test.* ***Results:*** *There were 27 patients included in this study. The cause of end-stage renal disease was mostly DM and hypertension. The most common complication after operation was catheter obstruction (9 patients). Another complication was intraabdominal bleeding (1 patient), and catheter migration (1 patient). In patients with straight catheter (20 patients), there were 8 patients (40%) with complication. In patients with coiled catheter (7 patients), there were 3 patients (42%) with complication. There was no significant difference in complications between straight and coiled catheter groups (p = 0,895).* ***Conclusion:*** *The result of this study revealed that no significant difference in complication between straight and coiled catheter for CAPD in end-stage renal disease patients.*

Keywords: *Continuous ambulatory peritoneal dialysis, Tenckhoff catheter type, complication, end-stage renal disease.*

Correspondence: Eka Yudha Rahman, c/o: Department of Urology, Faculty of Medicine/Indonesia University, Cipto Mangunkusumo Hospital. Jl. Diponegoro No. 71, Jakarta 10430. Phone: 021-3152892, 392 3631-32. Email: eyudtropmed2002@yahoo.com.

INTRODUCTION

The incidence of chronic kidney disease in Indonesia has increased to 1 - 2% of total population.[1,2] A previous study reported that 57% of end-stage renal disease patients were male and 43% were female, with the most common incidence found in age group of 50 - 59 years, comprising 25% of total patients. Rubin (2003) wrote that the most frequent causes of end-stage renal disease were diabetes mellitus (DM) and hypertension (26%). Another study reported that the causes of end-stage renal disease was DM (47%), hypertension (26%), and glomerulonephritis (8,7%).[3]

Patients with end-stage renal disease require renal replacement therapy (RRT) to replace reduced renal function, either naturally by replacement of a healthy kidney (renal transplantation) or artificially by replacing with artificial kidney (dialysis), either by hemodialysis or peritoneal dialysis. Renal transplantation is a surgical procedure to remove a healthy and well-functioning kidney from a living donor or a brain-dead individual to another patient with renal failure. Hemodialysis is the most frequent method to overcome end-stage renal disease. Hemodialysis requires a dialysis machine and dialysis fluid (dialysate). Hemodialysis is usually performed for 2,5 - 5 hours and in a frequency of 2 - 3 times a week.

Peritoneal dialysis is one type of therapy for patients with end-stage renal disease. Continuous ambulatory peritoneal dialysis (CAPD) has been employed since 1979 by Chris Hani Baragwanath

Hospital in Sowento. CAPD is found to be an inexpensive and effective method for end-stage renal disease patients who need dialysis. Peritoneal dialysis is a type of dialysis that uses a semipermeable peritoneal membrane as dialysis membrane. The basic principle is the ultrafiltration between dialysate fluid in peritoneal cavity and blood plasma. Until now, various techniques are employed and developed, supported by the availability of various types of commercial catheter and dialysate fluids as well as development of better antibiotics.

Use of peritoneal dialysis with CAPD as choice for renal replacement therapy reached 14% in United States, 6% in Japan, and approximately 9% in Hongkong and Mexico.[4] In Sardjito Hospital, Yogyakarta, end-stage renal disease patients who require RRT have been treated with hemodialysis since 1986. From 1991 renal transplantation has been performed, with up to 26 patient until July 2005. CAPD was started in 1995 and performed on 118 patients. Current data indicate that the surviving CAPD patients are 53 individuals.

Infection is the primary cause of complications in the CAPD program. Several studies wrote that socioeconomic factors, limited transportation, no permanent residence, and low level of education may limit the success of CAPD.[5] In addition, surgical technique and the type of catheter may also influence development of complications. In Sardjito Hospital, the technique employed by all operators are similar, which is the blind percutaneous maneuver with Tenckhoff trocar. However, the type of Tenckhoff catheters are different. Some operators use straight type and some others use coiled type. Until recently, there has been no comparative data regarding complications resulting from the use of both catheters.

OBJECTIVE

To compare complications of straight type and coiled type Tenckhoff catheters among end-stage renal disease patients undergoing continuous ambulatory peritoneal dialysis.

MATERIAL & METHOD

This study used an analytic prospective design, and was carried out at the Department of Urology and Nephrology, Sardjito Hospital, from January to December 2007. Subjects were all end-stage renal disease patients undergoing CAPD from January to December 2007. Identity, cause of renal disease (DM, non DM), and type of Tenckhoff catheter used were recorded. The presence or absence of post-CAPD complication was followed-up monthly. Data were analyzed statistically using Chi-square test with level of significance of $p < 0,05$, using SPSS 14.

RESULTS

In this study, 27 patients with end-stage renal disease underwent CAPD catheter from January to December 2007. Twenty patients used straight-type Tenckhoff catheter and 7 patients used the coiled type. Most subjects were male, comprising 18 patients, and most of the subjects were more than 50 years old (14 patients) (Table 1). The causes of renal failure are presented in table 2. The result of Chi-square test in table 3 and Post-CAPD complications are presented in table 4.

Table 1. Patient characteristics.

Characteristics		Freq	%
Sex	Male	18	66,66
	Female	9	33,33
Age	< 50 years	13	48,14
	> 50 years	14	51,85

Table 2. Cause of end-stage renal disease.

Disease	Freq	%
Diabetes mellitus	9	33,33
Hypertension	11	40,74
Chronic glomerulonephritis	5	18,51
Obstructive uropathy	2	7,4
Total	27	100

Table 3. Post-CAPD complications.

Type of compication	Freq	%
Catheter obstruction	9	33,3
Intraabdominal bleeding	1	3,7
Catheter migration	1	3,7
No complication	16	59
Total	27	100

Table 4. Correlation between catheter type and post-operative complication.

		Post-operative complication		Total	Chi square test *p*
		Absent	Present		
Type of catheter	Straight	12	8 (40 %)	20	0,895
	Coiled	4	3 (42%)	7	
Total		16	11	27	

DISCUSSION

Peritoneal dialysis is one of the therapies for patients with end-stage renal disease. Continuous ambulatory peritoneal dialysis (CAPD) has been employed since 1979. Peritoneal dialysis is one type of dialysis using peritoneum as a natural permeable membrane to regulate water and fluid balance. Peritoneal dialysis causes less physiological stress than hemodialysis. It does not need vascular access, can be carried out at home, and allows the patient more flexibility. Nevertheless, it requires more patient participation.

Currently there have been many techniques used and developed, supported by the availability of various types of commercial catheters and dialysis fluids, as well as development of better antibiotics. There are several operating techniques in peritoneal dialysis since first introduced until now, such as (1) Blind percutaneous maneuver using Tenckhoff trocar, (2) Blind percutaneous maneuver using guide wire, (3) Open surgical procedure, (4) Peritoneoscopy/laparoscopy/videolaparoscopy using minitrocar, (5) Modified technique (Moncrief-Popovich, Presternal-Swan Neck).[6] This study used blind percutaneous maneuver using Tenckhoff trocar.

This study found that complications post-CAPD operation were present in 11 patients (40,7%) and those without complications were 16 (59,3%). This indicated that the complication rate of post-CAPD operation in Sardjito Hospital was relatively high. The most common types of complication were obstructed catheter, which were found in 9 patients (33,3%). Other complications, intraabdominal bleeding and migrated catheter, were found in 1 patient (3,7%). Common catheter-related complications in the use of CAPD for the treatment of end-stage renal disease are surgical wound infection, peritonitis, internal organ trauma or perforation, bleeding, abdominal pain, ileus, early leakage, hematoma, catheter malfunction, and catheter obstruction. Based on the type of Tenckhoff catheter used, there were 8 patients using straight catheter who had complication (40%), while those using coiled catheter, 3 had complications (42%). Statistical analysis with Chi-square test revealed no significant difference (p = 0,895) between the use of straight and coiled type of Tenckhoff catheter in post-operative complications among CAPD patients.

CONCLUSION

This study showed that there is no significant difference between use of straight and coiled Tenckhoff catheter among CAPD patients regarding occurrence of post-operative complications.

REFERENCES

1. Junger P, Choukron G, Robino C, Massy ZA. Epidemiology of end stage renal disease in the Ile-de-France area: A prospective study in 1998. Nephrol Dial Transplant 2000; 15: 2000-6.
2. Stuart J. Kidney transplantation and dialysis access. Basic science and clinical evidence surgery. Springer-Verlag: New York, Inc; 2001. p. 1449-62.
3. George P, Robert AG. Health-related quality of life predictorof survival and hospital utilization. Health Care Financing Review 2000; 21 (3): 171-84.
4. Anupkumar S, Oreopolus DG. Peritoneal dialysis, its indication, and contraindication. Dialysis and Transplantation 2000; 29 (2): 71-7.
5. Ivor JK, Lana S, Mark H. An African community-based chronic ambulatory peritoneal dialysis programe. Nephrol Dial Transplant 2001; 16: 2395-400.
6. Moncrief JW, Popovich RP, Dopbros. Continous ambulatory peritoneal dialysis; The Textbook of Peritoneal Dialysis. Kliwers Academic Publisher; 1994. p. 257-397.