

A Rare Case of Refractory Peritonitis after Draining High-Temperature Peritoneal Dialysis Fluid into Abdominal Cavity

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Abstract

Peritonitis is a common complication of peritoneal dialysis (PD), but peritonitis due to draining high-temperature peritoneal dialysis fluid into abdominal cavity was unusual and no lecture reported so far. Here we report a case of daytime ambulatory peritoneal dialysis (DAPD)-related peritonitis due to draining high-temperature peritoneal dialysis fluid into abdominal cavity. Importantly, we made a culture of the peritoneal dialysis fluid instantly the patient was admitted though she without any symptom of peritonitis. And be different with previous treatment, here peritoneal dialysis was stopped and replaced by hemodialysis and using intravenous antibiotics treatment, but without abdominal catheter removal. Final, peritonitis was controlled and the patient restarted to DAPD.

Keywords: Peritoneal dialysis; High-temperature; Peritoneal dialysis fluid; Peritonitis; Dialysis fluid culture

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Introduction

Peritoneal dialysis common complication is Peritonitis. This case report states that ambulatory peritoneal dialysis (DAPD)-related peritonitis leads to draining high-temperature peritoneal dialysis fluid into abdominal cavity. The report concludes that peritonitis was controlled and the patient restarted to DAPD.

Case Study

A 57 year old female was admitted to hospital in January 2016 because abdominal discomfort after draining high-temperature peritoneal dialysis fluid into abdominal cavity for 10 min.

She suffered from end stage renal failure due to unknown cause and was resumed on daytime ambulatory peritoneal dialysis (DAPD) in June 2015. Peritoneal permeability in the fast-peritoneal equilibrium test remained at low average transport (D/Pcr=0.61) and peritoneal Kt/V urea was 1.83. She had been prescribed with 1.5% glucose dialysate (2 L/bag, 3 bags/day, 4 h/bag) and kept abdomen dry at night. She had no past history of infectious peritonitis.

The moment admitted to hospital, she had no fever and abdominal pain and peritoneal dialysis (PD) fluid was clear. Physical examination revealed her blood pressure was 155/92

mm Hg, pulse 72 beats/min and temperature 36.4°C. Her abdomen was soft, no tenderness and rebound tenderness. Meanwhile, inflammatory markers (white blood cells, C-reactive protein [CRP] and procalcitonin) were not evidently elevated (11970 μ L, <1 mg/L and 0.18 ng/ml, respectively) and the total leukocyte count of the dialysis fluid was only 5×10^6 /L (**Table 1**). Though she without any symptom of peritonitis we made a culture of the peritoneal dialysis fluid instantly. Over the next two days, abdominal discomfort gradually disappeared and the general condition of the patient was well. But at the third day of admission she presented with fever (39.0°C), abdominal pain and PD fluid became turbid without known cause. Blood analysis showed neutrophils, CRP and procalcitonin levels elevated significantly (**Table 1**). The total leukocyte count of the dialysis fluid was 830×10^6 /L, with 95% neutrophils (**Table 1**) shows the clinical condition). Infectious peritonitis was tentatively diagnosed based on these findings. Intraperitoneal (IP) ceftizoxime and vancomycin were started for empirical treatment of PD peritonitis. Culture of the dialysis effluent yielded streptococcus oralis which was sensitive to vancomycin, while blood culture was negative. However, after five days of IP antibiotics therapy (vancomycin) her peritonitis did not respond and she still with fever and abdominal pain. We explained the necessity of a surgical operation to the patient,

Table 1 The clinical condition at different time point of the patient.

Clinical index	Different time points (day)					
	d1	d3	d8	d13	d15	d21
Clinical symptoms						
Abdomen pain	(-)	(+)	(+)	(±)	(-)	(-)
Fever	(-)	(+)	(+)	(±)	(-)	(-)
Turbid PD fluid	(-)	(+)	(-)	(-)	(-)	(-)
Blood WBC ($\times 10^9/l$)	11.97	14.92	7.47	7.15	-	6.12
N (%)	95	88	87	0.71	-	0.68
CRP(mg/l)	<1	32	39	35	-	3
Procalcitonin (ng/ml)	0.18	-	4.0	1.89	-	-
Ascites cell count ($\times 10^6/l$)	5	830	2280	799	395	350
Polykaryocyte (%)	-	95	80	52	17	10
Monocyte (%)	-	5	20	48	83	90
PD fluid cultrue (Turnaround time)	Streptococcus oralis (d6)	Negative (d8)	Negative (d13)	Negative (d18)	Negative (d20)	-
Treatment	Regular treatment	ceftizoxime and vancomycin (IP), PD	Vancomycin (IV), HD	Vancomycin (IV), HD	Vancomycin (IV), HD	PD

IP: Intraperitoneal, IV: Intravenous, PD: Peritoneal Dialysis, HD: Hemodialysis

but she did not accept PD catheter removal. Therefore, DAPD was stopped and replaced by hemodialysis and intravenous (IV) vancomycin treatment, but without abdominal catheter removal. Her peritonitis gradually resolved after 2 weeks of intravenous vancomycin. Then she was resumed on peritoneal dialysis again and the dialysis prescription as previous, while hemodialysis was stopped.

Two months later for peritoneal function evaluation, the fast-peritoneal equilibrium test revealed peritoneal permeability at low average transport ($D/P_{cr}=0.58$) and peritoneal Kt/V urea was 2.08.

Discussion

Peritonitis is a common and important complication in PD patients, but peritonitis due to draining high-temperature peritoneal dialysis fluid into abdominal cavity was rare and no lecture reported such cases so far. Dialysis fluid culture is a most important examination for peritonitis patient, which is helpful for treatment. When draining high-temperature peritoneal dialysis fluid into abdominal but without any clinical symptom, do dialysis fluid culture is needed? In our case we made the culture instantly and the result was positive which is helpful for our subsequent therapy.

Usually peritoneum with host defence to eliminate some bacteria into the abdominal cavity, so clinical peritonitis may not happened though bacteria into abdominal cavity. There are two approaches of bacteria into abdominal cavity of peritoneal dialysis patients, including exogenous and endogenous ways. Common causes include contamination during dialysate exchange, exit site/tunnel tract infection, intra-abdominal pathologies or ascending gynaecological infections. In this case, culture of the dialysis effluent yielded streptococcus oralis, which usually existed in oral cavity [1]. So we speculated that peritoneum injured by high-temperature peritoneal dialysis fluid, then not able to eliminate bacteria transferred from gut or contamination during

dialysate exchange, finally result in peritonitis. Therefore, when the peritoneum injured by high-temperature peritoneal dialysis fluid we should keep gut function well and perform peritoneal dialysis through a rigorous cleaning process to prevent clinical peritonitis, though initially without fever, abdominal pain and PD fluid became turbid.

Evidence was insufficient to identify the optimal agent, route or duration of antibiotics to treat peritonitis [2]. Bennett-Jones 1987 reported that IP antibiotics were superior to IV antibiotics in peritonitis treatment [3]. Coincidentally, the latest recommendation described that IP antibiotics were superior to IV antibiotics in peritoneal dialysis-related infections [4]. In this case, according to peritoneal fluid culture result the patient was treated with intraperitoneal antibiotics, specifically vancomycin. However, after five days therapy the peritonitis still not respond. According to guideline PD catheter removal may be the best treatment for persistent peritonitis [2]. For this patient we did not remove PD catheter but only stopped peritoneal dialysis and replaced by hemodialysis, meanwhile continued intravenous vancomycin therapy. Gradually, fever and abdominal pain improved. Two weeks later, all the clinical symptoms of peritonitis were disappeared and repetitive effluent fluid cultures were all negative. So stopped peritoneal dialysis and replaced by hemodialysis but without PD catheter removal may be a recommended treatment strategy for peritonitis induced by high-temperature peritoneal dialysis fluid.

Conclusion

So far, it is the first reported case that peritonitis induced by high-peritoneal dialysis fluid and had a successful treatment. From this case we can extract experience and draw a lesson when peritoneum injured high attention should take and dialysis fluid culture should make instantly, though without clinical symptom, and when peritonitis developed stopping peritoneal dialysis and replaced by hemodialysis but without PD catheter removal may be a recommended method.

Disclosures

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References

- 1 Do T, Jolley KA, Maiden MC, Gilbert SC, Clark D, et al. (2009) Population structure of streptococcus oralis. *Microbiology* 155: 2593-2602.
- 2 Ballinger AE, Palmer SC, Wiggins KJ, Craig JC, Johnson DW, et al. (2014) Treatment for peritoneal dialysis-associated peritonitis. *Cochrane Database Syst Rev* 26: 5284.
- 3 Bailie GR, Morton R, Ganguli L, Keaney M, Waldek S (1987) Intravenous or intraperitoneal vancomycin for the treatment of continuous ambulatory peritoneal dialysis associated gram-positive peritonitis? *Nephron* 46: 316-318.
- 4 Li PK, Szeto CC, Piraino B, Bernardini J, Figueiredo AE, et al. (2010) International society for peritoneal dialysis peritoneal dialysis-related infections recommendations: Update. *Perit Dial Int* 30: 393-423.