PLEASE NOTE: UNDER REVIEW

D-00-07-30270

PATIENT CARE GUIDELINES

SITE APPLICABILITY: VGH

GUIDELINE: Peritoneal Dialysis: Hypervolemia

PRACTICE LEVEL:

An RN trained in peritoneal dialysis may perform this task.

BACKGROUND INFORMATION:

The Nephrologist assigns a dry weight to each PD patient which is reassessed at regular times. Dry weight is defined as no detectable edema and any further reduction in body weight causes orthostatic hypotension, muscle cramps, and nausea. Other symptoms of fluid overload include weight gain, edema, hypertension, shortness of breath, cough. Congestive heart failure is a severe complication of untreated hypervolemia.

Hypervolemia may be due to poor outflow caused by mechanical problems, ultrafiltration (UF) failure, dietary and fluid non-compliance, and incorrect use of the different strengths of solution, hyperglycemia, and intercurrent illness.

UF is achieved mainly by the concentration gradient between the glucose in the dialysis bags and the glucose in the capillary blood. The concentration gradient is highest early in the dwell but will rapidly fall as the glucose is absorbed into the blood and water from the blood dilutes the dialysate. The UF can be maintained for longer by shortening the dwell times or using stronger strength glucose solutions. Icodextrin, a glucose polymer solution can also be used. This solution is less easily absorbed because of the larger molecule size.

PROBLEM STATEMENT:

Fluid overload contributes to cardiovascular disease which plays a role in the high mortality and morbidity of dialysis patients.

GOAL:

PD patients should maintain fluid balance.

PROCEDURE / RECOMMENDATIONS / ASSESSMENT:

Signs of Fluid Overload:

1. Blood pressure elevated from baseline

2. Weight gain
3. Edema: peripheral and/or subcutaneous
4. Neck vein distension
5. Pulmonary edema
6. Congestive heart failure

Intervention:

1. **Monitor vital signs and weight.**
2. **Monitor cardiac and respiratory signs.**
3. **Salt and fluid restriction may be necessary until understanding and correction of fluid overload.**
4. **Use of hypertonic solutions.**

Once the diagnosis of fluid overload is made an assessment must be made to determine the cause of the problem and to correct it:

1. Constipation because of decreased bowel motility is a frequent cause of poor drainage. History of bowel habits and treating constipation often corrects drain problems.
2. Selecting inappropriate solution strengths can lead to hypervolemia. Also at times home patients may skip exchanges, space them too close or too far apart, or shorten the length of cycler treatment. The nurse must take a history of the solutions used, amount of drainage and treatment times. Calculating the patient's fluid intake vs. output and performing an exchange and measuring the amount of drainage also is helpful. Ongoing education and reinforcement of solution choices is critical. When residual renal function is lost patients may need to be reminded of the need for the use of hypertonic solutions to assist with fluid removal.
3. Excessive salt or fluid intake may lead to fluid overload. Accurately review dietary history and refer to the dietician. Some patients will need to restrict fluid intake.
4. Peritoneal dialysis patients have a tendency towards hyperglycaemia and diabetes because glucose is absorbed from the solutions. Hyperglycaemia reduces the concentration gradient and also the ultrafiltration (UF). Treatments include adjusting insulin dosages, review of diet and exercise regime, referral to diabetic nurse and dietician or Endocrinologist or Diabetic clinic. Icodextrin® a glucose polymer solution does not contribute to the sugar load and tends to help in maintaining the gradient for longer. To remove fluid shorter dwell times may be necessary.
5. Poor outflow caused by malpositioning of the internal catheter or entrapment in omentum should be ruled out. Inflow and outflow of the dialysis fluid should be steady and rapid. Catheter repositioning may be necessary.
6. Leaks and hernias may also hinder proper drains. Surgical correction may be necessary. Depending on the severity of the leak or hernia smaller fill volumes may be prescribed.
7. When all of the previous reasons for fluid overload are ruled out membrane failure may be the cause of the fluid overload. Doing a PET (Peritoneal Equilibration Test) will be useful as will measuring the output after a 4 hour dwell of a hypertonic solution. Treatment may be reducing or eliminating long dwell times and use of Icodextrin®, fluid restriction, use of lasix or transfer to hemodialysis.

ASSOCIATED GUIDELINES / FORMS / EDUCATIONAL MATERIAL:

- Peritoneal Dialysis: Hernias [D-00-12-30313]
- Peritoneal Dialysis: Catheter Exit Site or Subcutaneous Leaks (Extravasation) [D-00-12-30309]
- Peritoneal Dialysis: Hypovolemia [D-00-07-30273]

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UNIT(s) OF ORIGIN: Peritoneal Dialysis Unit
APPROVED FOR POSTING:

Lorraine Blackburn, Director Professional Practice Nursing, Vancouver

DATE OF CREATION/REVIEW/REVISION:

Original publication date: May 2005
Review / revision date(s): Jan/2013 *(minor change)*

ALTERNATIVE SEARCH TERMS: PDU

AUTHORIZATION CODE: