복막투석 교육 프로그램

가톨릭대학교 의과대학 내과학교실

송 호 철

Set up a Successful PD Education Program

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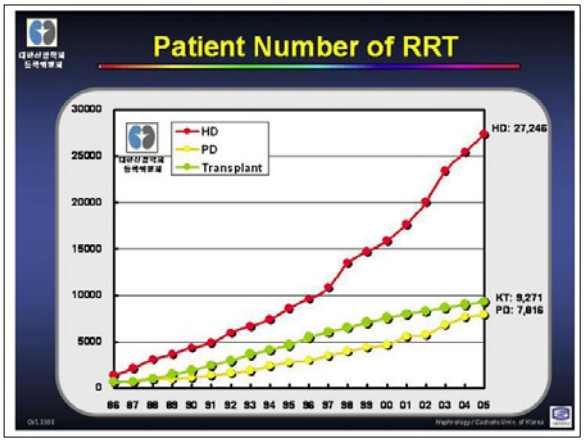
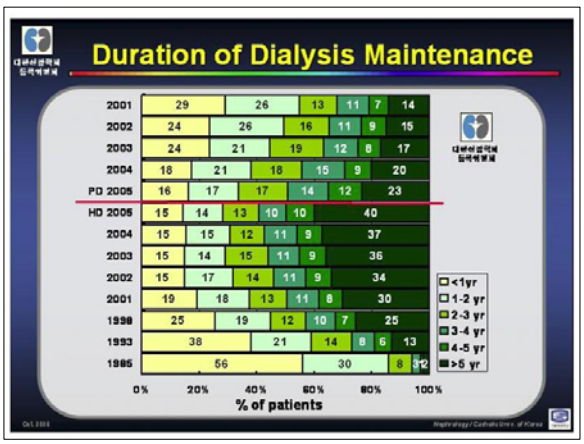
1970년대 복막투석이 신대체 요법의 중요수단의 하나로 자리를 잡은 후 미국내에서는 전체 신대체 요법 환자에서 복막투석 환자가 차지하는 비율이 지속적으로 감소하고 있는 추세이고 국내의 경우에서도 최근 그 증가추세가 둔화되고 있는 실정이다. 최근 복막투석 관련분야의 기술적 발전이 이루어져 환자 생존율과 기술적 생존율에 많은 증가가 있었으나 복막투석 환자에서 기술적 생존률이 혈액투석에 비해 떨어지는 것으로 보고되고 있다. 2005년 대한신장학회에서 발표한 신대체 요법의 현황보고에서도 복막투석환자에서 5년 기술적 생존율이 23%로 혈액투석의 40%에 비해 현저히 낮음이 보고되었다. 이에 대해서는 환자의 고령화, 당뇨환자 비율의 증가 등이 여러 가지 원인이 지적되고 있으나 환자들의 교육과 이에 대한 체계적인 복막투석 환자 관리프로그램 부재 역시 한 원인으로 판단된다.

훈련된 교육자를 통해 조직화되고 표준화된 교육 프로그램이 투석전부터 환자에서 제공되는 것은 복막투석환자의 관리의 시발점이 된다. 복막투석에 적절한 환자가 선택되고 이러한 선택이 의사에게서 환자에게 충분이 설명된다면 복막투석환자의 순응도와 기술적 생존율을 올리는데 중요한 요인이 된다. Little 등도 환자들이 의사로부터 투석방법을 설명 듣고 투석의 방법을 본인이 선택하였을 때 환자의 삶의 질과 투석에 대한 순응도가 의사의 선택에 의한 경우 보다 높다고 보고하였다. 투석의 시작 후에도 지속적으로 병원과 투석센터에서 환자와 그 가족 등에게 복막염의 예방, 출구부위 감염, 영양의 중요성이 제공되는 것이 매우 중요하다. 많은 보고에서 지속적으로 환자나 그 가족에게 제공되는 경우 복막염의 발생빈도가 현저히 낮아짐이 보고되고 있다. 순응도(compliance) 역시 환자교육의 중요 요소이다. Raj는 순응도가 환자의 투석의 적절도에 중요한 요소이며 순응도가 떨어지는 경우 복막투석환자의 생존율 역시 떨어진다고 보고하였다. 또한 이에 대한 대안으로 APD를 하나의 대안으로 제시 하였다. 영양사를 통해 환자에서 식사에 대한 조언과 식이치료는 환자의 또 하나의 중요한 요소이다. 결론적으로 복막투석환자에서 환자의 삶의 질을 높이고, 환자의 생존율 및 기술적 생존율의 향상을 위해 신장내과의사, 외과의사, 복막투석 전담간호사, 영양사, 사회사업과가 한 팀이 되어 체계적이고 잘 훈련된 관리 프로그램이 제공되어야 한다.

Background

- The percentage of PD: Decreased in US
- Patient training is an essential
- Patient Outcomes & training quality & time
- Few reference provide guideline to the actual training process





Role of Physician

- Provide opportunity to learn theory & skills of PD trainee
- Physician should not assume that
  : a nurse would have these skill
- Industry-sponsored PD trainer
  : responsible for determining the quality

Who should be a PD trainer ?

- A Nurse should provide PD training
- ISPD recommendation
  : 6-8 weeks orientation
- Good communication skill
- Be innovative and consistent

Recommended peritoneal dialysis curriculum for trainees

- Anatomy and physiology of peritoneum
- Modalities & their indication
- Clearance on peritoneal dialysis
- Ultrafiltration and management of volume
- Management of nutritional status
- Treatment of Complication
- Dialysis solution and biocompatibility

Who is learner ?

- Patient alone
  With partner
  The partner alone
- PD trainer should determine learner
- Cognitive skills may be compromised
  : requiring much patience and repetition

Component of PD Education Program

- Pre-dialysis
  : Patient selection
- During dialysis
  : Prevention of peritonitis
  : Prevention of exit site infection
  : Education about Nutrition
  : Monitoring about dialysis Compliance

Patients selection-modality

Table 1. Example of Eight Case Histories of Patients With ESRD

Please Select the Best Option:		In-Center HD	Home HD	PD	Not a Candidate for RRT
Q1.	A 55-year-old white woman who lives alone, is compliant with treatment, has diabetes, weighs >200 lbs, and produces >250 mL of urine per day?	o	o	o	o
Q2.	A 52-year-old white man who lives alone, is compliant with treatment, has diabetes, weighs >200 lbs, and has no residual renal function?	o	o	o	o
Q3.	A 39-year-old white man who lives alone, is not compliant with treatment, is HIV+, does not have diabetes, weighs >200 lbs, and has no residual renal function?	o	o	o	o
Q4.	A 78-year-old Asian man who lives with family, is compliant with treatment, has a 25% ejection fraction, does not have diabetes, weighs <200 lbs, and produces >250 mL of urine per day?	o	o	o	o
Q5.	A 57-year-old white woman who lives with family, is compliant with treatment, has diabetes, weighs >200 lbs, and produces >250 mL of urine a day?	o	o	o	o
Q6.	A 52-year-old white man who lives with family, is compliant with treatment, is HIV+, does not have diabetes, weighs <200 lbs, and has no residual renal function?	o	o	o	o
Q7.	A 86-year-old Asian man who lives alone, is not compliant with treatment, has diabetes, weighs <200 lbs, and has no residual renal function?	o	o	o	o
Q8.	A 47-year-old black woman who lives alone, is not compliant with treatment, is HIV+, does not have diabetes, weighs >200 lbs, and has no residual renal function?	o	o	o	o

NOTE. Nephrologists were asked to select the most appropriate dialysis treatment option, assuming that each patient: (1) started dialysis within the past 3 months, (2) never underwent transplantation, (3) is not pregnant, (4) has no history of major surgery (eg, abdominal), and (5) has no comorbid conditions other than those specified in the case histories.
Abbreviation: RTT, renal replacement therapy.

American Journal of Kidney Diseases, Vol 36, No 6 (December), 2000: pp 1155-1165

Patient selection

Table 5. Independent Associations With Choice of Modality by Logistic Regression Analysis

Factor	Odds Ratio in Favor of PD	95% Confidence Interval	*P*
Male sex	0.55	0.311-0.975	0.041
Older age (per y)	0.98	0.963-0.998	0.03
Being married	2.41	1.330-4.372	0.004
Counseled before dialysis	2.00	1.122-3.550	0.019
Distance from base unit (per mile)	1.09	1.049-1.138	<0.001

American Journal of Kidney Diseases, Vol 37, No 5 (May), 2001: pp 981-986

생활속의 복막투석 - 직업



너무 무리가 되지 않는 선에서 일을 가지는 것은 삶의 활력을 주므로 계속 유지하도록 합니다.

다만 복막투석 교환은 집에 돌아와서 하거나 깨끗하고 조용한 장소에서 시행하도록 유의하여야 합니다.

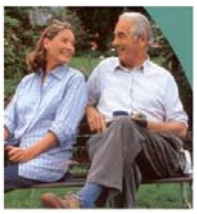
생활속의 복막투석 - 여행


여행을 할 경우 사전에 병원 의료진과 회사의 담당 직원에게 투석액에 대해 상의합니다

짧은 여행인 경우에는 본인이 투석액과 일회용캡 등 준비물을 가지고 가도록 합니다

여행기간이 긴 경우에는 여행지에 투석액 배송이 가능한지 여부를 미리 확인하고 투석액 도착 여부를 점검합니다

생활속의 복막투석 – 가족과 함께 하는 삶



가족들과 치료방법에 대해 자유롭게 논의하는 것은 중요합니다.

일반적인 복막투석 과정이 초기에는 가족들에게 당황스러울 수 있으므로 충분한 대화를 통해 이해부족과 불안감을 줄이는 것이 필요합니다.

11. 투석 환자의 복지 혜택

▪ 국민연금 장애연금

신장질환 경우 오심,구토 등의 임상증상, 신장기능 검사 성적, 일반상태, 치료 및 병상 경과, 투석요법 실시 상황에 따라 인정한다.

* 장애 연금 신청 절차
  관할 국민 연금 관리 공단에서 국민연금 진단서를 받는다.
  병원에서 진단서 발급받아 공단에 제출 . 심사후 지급

▪ 국민연금가입자 생활 자금 저리융자

대상자 : 연금 가입후 5년이 지난 사람
대부 종류: 의료비, 학자금, 경조사비, 재해복구비 등

기타 관련 지원에 대한 사항은 해당 동사무소, 보건소에 문의하십시오!!

What should be taught?

- Overview of PD
- Aseptic technique
- Steps in exchange procedures
- Emergency measures for contamination
- Exit-site care
- Complication (peritonits)
- Recording Keeping
- Holiday protocol, employment, hobbies

Preparing for Training

- Best in quiet room
- At least two chairs and a table
- Place to wash hands
- A training apron with a PD catheter
- IV pole or machine connection
- Patient Outcomes
  : Home > Hospital

Duration of Training

- Unable to recommend: specific duration
- Meet the following objects

: able to safely perform all procedure

: able to recognize contamination and infection

: able to list a appropriate response

Retraining

- Recommends retraining after

: Peritonitis

: Catheter infection

: Prolonged hospitalization

: Any interruption in PD

- Periodic retraining should performed on a regular basis

Type of home assistance and peritonitis risk on peritoneal dialysis 1221

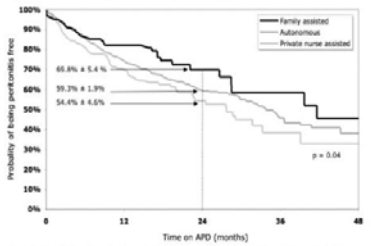
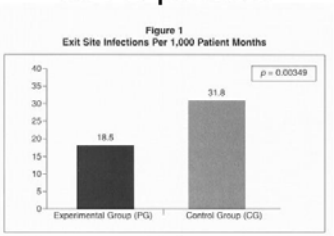
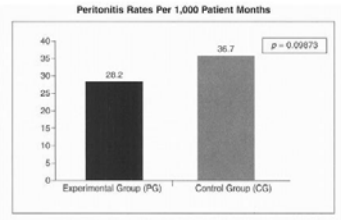
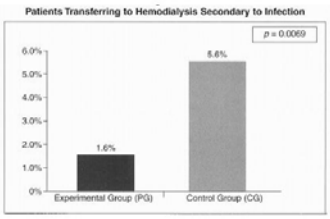


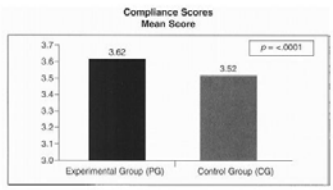
Fig. 1. Analysis of data from the French PD Registry regarding the probability of being peritonitis free for new automated peritoneal dialysis (APD) patients who started their treatment between 2000 and 2004, and who were followed-up until early 2005. Percentages regarding autonomous patients, persons assisted by a family member and those assisted by a private nurse are shown.

Effect of Training Methods on PD patients









Education: Nutrition

Improving Albumin Levels Among Hemodialysis Patients: A Community-Based Randomized Controlled Trial

Janeen B. Leon, MS, RD, LD, Jeffrey M. Albert, PhD, Gina Gilchrist, RD, LD, Irving Kushner, MD, Edith Lerner, PhD, Suzanne Mach, MS, RD, LD, Angela Majerle, RD, LD, David Porter, BA, Edmond Ricanati, MD, Laurine Sperry, RD, LD, Catherine Sullivan, BS, Jennifer Zimmerer, MS, RD, LD, and Ashwini R. Sehgal, MD

• *Background:* Low albumin level is a strong predictor of mortality and morbidity among hemodialysis patients, yet few interventions are available to improve albumin levels. Moreover, the relative importance of nutritional barriers versus inflammation in contributing to hypoalbuminemia is unclear. We sought to determine whether targeting specific nutritional barriers will improve albumin levels. *Methods:* We conducted a randomized controlled trial involving 180 patients with baseline albumin levels less than 3.7 g/dL (<37 g/L) at 44 long-term hemodialysis facilities. Study coordinators identified and intervened on specific barriers present among intervention patients, whereas control patients continued to receive the usual care. Barriers targeted included poor nutritional knowledge, poor appetite, help needed with shopping or cooking, low fluid intake, inadequate dialysis dose, depression, difficulty chewing, difficulty swallowing, gastrointestinal symptoms, and acidosis. *Results:* At baseline, intervention and control patients had similar albumin levels, dietary intakes, levels of inflammatory markers, and numbers of nutritional barriers. After 12 months, intervention patients had greater increases in albumin levels compared with control patients (+0.21 versus +0.06 g/dL [+2.1 versus +0.6 g/L]; $P < 0.01$), as well as greater increases in energy intake (+4.1 versus −0.6 Kcal/d/kg; $P < 0.001$) and protein intake (+0.13 versus −0.06 g/d/kg; $P < 0.001$). The intervention appeared most effective for barriers related to poor nutritional knowledge, help needed with shopping or cooking, and difficulty swallowing. About half the subjects had elevated levels of inflammatory markers, but there was no relationship between change in levels of albumin and inflammatory markers. *Conclusion:* A nutrition intervention tailored to patient-specific barriers resulted in modest improvements in albumin levels regardless of levels of inflammatory markers. *Am J Kidney Dis* 48:26-36.

Interventional Group

- Study coordinators educated patients
  : Poor nutritional Knowledge
  : Poor appetite
  : Low fluid intake
  : Inadequate dialysis dose
  : Depression
  : Acidosis

Table 2. Changes in Nutritional Parameters and Nutritional Barriers

	Intervention	Control	*P*
Albumin (g/dL)	+0.21	+0.06	<0.01
Change in albumin ≥ 0.20 g/dL and survived (%)	42	29	0.06
Postdialysis weight (kg)	−0.06	−0.50	0.52
Body mass index (kg/m²)	−0.06	−0.18	0.62
Energy intake (Kcal/d/kg)	+4.1	−0.6	<0.001
Protein intake (g/d/kg)	+0.13	−0.06	<0.001
Subjective global assessment (%)			
Improved	16	16	
No change	77	76	0.93
Worsened	7	9	
Poor nutritional knowledge			
Subjects with barrier	35	41	
Overcame barrier (%)	89	22	<0.001

Compliance

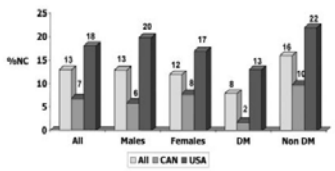


Fig 1. Admitted NC rates by country, sex, and diabetic status. $P < 0.001$ for CAN versus USA and for DM versus Non DM. Abbreviations: CAN, Canadian patients; USA, US patients; All, all patients; DM, diabetes mellitus.

American Journal of Kidney Diseases, Vol 35, No 3 (March), 2000: pp 506-514

Table 1. Components of CAPD Compliance Questionnaire

It is known that some individuals on CAPD miss some of their exchanges. We have prepared this survey to identify the frequency and possible causes of this problem.

Please remember that your complete honesty is essential in answering these questions and that individual responses will be kept confidential from doctors and nurses. You are assured that your participation will not jeopardize the quality of care you receive. Part A should be completed by your nurse or physician before you complete Part B. When you are finished, please seal the questionnaire in the envelope provided.

Part A:
Dialysis Center: _____ Patient Initials: _____
Primary Renal Disease: _____ Diabetes: Yes _____ No _____
Present CAPD Prescription: Number of Daily Exchanges: (Circle) 3 4 5 More
Volume in Liters: (Circle) 1½ 2 2½ 3
Time on CAPD: Years: _____ Months: _____ Exchange System Used: (eg Ultrasat, Freedom Set, etc) _____
Number of episodes of peritonitis in past 12 months: _____

Part B:
Age: _____ Sex: _____ Race: _____ Presently Employed: Yes: _____ No: _____
Highest Level of Education Achieved: Less than High School Diploma _____ High School Diploma: _____
College Diploma: _____ University Degree _____
Distance You Live from Dialysis Center: _____ miles Live Alone: _____ Live With Others: _____
Who does your dialysis exchanges? (circle the correct answer):
a) Myself b) Spouse c) Other family member d) Nurse e) Other (specify) _____
How well do you feel on CAPD on a scale of 1-7, where 1 indicates "very poorly" and 7 indicates "very well." (circle the appropriate number) 1 2 3 4 5 6 7
How satisfied are you with your CAPD treatment on a scale of 1-7, where 1 indicates "very dissatisfied" and 7 indicates "very satisfied." (circle the appropriate number) 1 2 3 4 5 6 7
How many exchanges have you missed in the last week? _____
Approximately how many exchanges have you missed in the last month? _____
Do you ever deliberately flush more dialysate into your drain bag than you are supposed to? Yes: _____ No: _____
If so, do you do it (circle the appropriate answer) a) every exchange b) 1 to 3 times a day
c) not every day, but more than once a week, d) less than once a week.

American Journal of Kidney Diseases, Vol 35, No 3 (March), 2000: pp 506-514

Table 6. Multivariate Logistic Regression Analysis of Predictors of NC

Variable	*R*	*P*
No. of exchanges	0.20	0.0000
Black race	0.14	0.0008
Age	−0.13	0.0016
Employed	0.12	0.0024
Diabetes	−0.10	0.0105
US unit	0.05	0.0772

American Journal of Kidney Diseases, Vol 35, No 3 (March), 2000: pp 506-514

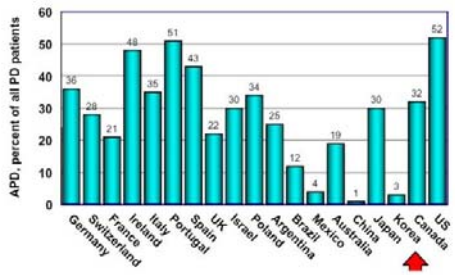
Consequence of noncompliance

- Delivered Kt/V was 16% less than Prescribed Kt/V
- Inadequate clearance
  : technique failure
  : mortality
  : morbidity
- Difference in compliance
  : U.S. patients vs Canadian patients survival

Modification of therapy

- APD : low incidence of peritonitis
  : good compliance
  : adolescents & required assistance
  : abdominal distension during PD
- Low clearance in APD
  : conversion to CCPD

APD utilization in in selected countries



Conclusion

- Training is an essential component of peritoneal dialysis program
- Misconception that anyone can train patients
- Curriculum for nephrology trainee
- Need for guideline and standards for patient training program

Nephrology Team

- Nephrologist
- Trained Nurse
- Social Worker
- Dietitian