

Descriptive study about the practice of home peritoneal dialysis

Authors

Sarah Silva Abrahão¹
 Janete Ricas²
 Darly Fernando Andrade³
 Fátima Chagas Pompeu⁴
 Leila Chamahum⁵
 Tâmara Miguel Araújo⁶
 José Maria Penido Silva⁷
 Cristiane Nahas⁸
 Eleonora Moreira Lima⁷

¹Coordination of the SUS/Convênios/Particulares Sector of the Hospital das Clínicas of UFMG
²Pediatric of Universidade Federal de São João del Rey, Dean office of UFSJ

³Directorial board of Gaus Estatística e Mercado

⁴Social Welfare Work of the Section of Nephrology and Hemodialysis of the Hospital das Clínicas of UFMG

⁵Section of Nephrology and Hemodialysis of the Hospital das Clínicas of UFMG

⁶Coordination of the Section of Nephrology and Hemodialysis of the Hospital das Clínicas of UFMG

⁷Section of Nephrology and Hemodialysis of the Hospital das Clínicas of UFMG

⁸Section of Nephrology of FHEMIG

Submitted on: 10/14/2009

Accepted on: 12/03/2009

Corresponding author:

Sarah Silva Abrahão
 Av. Alfredo Balena, 110, B
 Santa Efigênia,
 Belo Horizonte – MG - Brazil
 CEP: 30130-100

We declare no conflict of interest.

ABSTRACT

Introduction: As experienced with the assistance evaluation of children/adolescents with chronic kidney disease in dialysis treatment on hospital we thought about which aspects could be relevant to the peritoneal dialysis (PD) application at home. The objective was to describe the level of schooling and information of the parents about the PD technique, general conditions of the place used to do PD at home and search association with inadequate technique. **Method:** From March 2004 to May 2006 a descriptive study of an universe of 30 children and adolescents with chronic kidney disease treated in the HC/UFMG. To obtain the results was undertaken the software SPSS version 13.0. The parameters: low educational level, low family income, inadequate level of information, inadequate hygiene of hands during peritoneal dialysis (PD) procedure, were associated with worse quality of PD technique. **Results:** The technique application of PD quality was considered inadequate in 18 (60%) patients. All the *Odds Ratio* values were into the confidence interval (95%) limits and were higher than 1 showing a possibility of a positive association between some independent variables and variable researched although without statistic significance. **Conclusion:** The statistical analysis did not show association between the parameters tested although they may have a positive role in the success of the dialysis technique.

Keywords: peritoneal dialysis, continuous ambulatory peritoneal dialysis, home visit, caregivers.

[J Bras Nefrol 2010;32(1):43-48]©Elsevier Editora Ltda.

INTRODUCTION

Chronic kidney disease (CKD) in childhood is the common end of several systemic or primarily renal or urologic diseases.¹ Treatment is proposed according to the stage of the disease. Patients usually search for medical care in an advanced stage, when dialysis [peritoneal dialysis (PD) or hemodialysis (HD)] often become essential for life maintenance.

Since 1978, when PD was introduced for pediatric patients with end-stage renal failure, a series of technological advances has been incorporated to the procedure.² Significant results relating to safety, comfort, and efficacy of dialysis have been obtained through mechanical enhancements in dialysis exchanges and with better biocompatibility of the solutions. More recently, the revolution in the fields of electronic and computing sciences has provided a chain of automated systems (the cyclers), which allowed not only more flexibility for prescriptions, but also monitoring of therapeutic results and commitment/compliance of patients or their guardians.³

In the past 20 years, the development of cyclers made PD a practical solution for dialysis for children and adults at home and at the hospital.^{2,4,5,6,7} The introduction of the cycler and then the refinement of the techniques have positively contributed to popularize the method of continuous cycling in several countries.⁸

However, despite the evolution of equipments and solutions for dialysis, other variables influence the success of the procedure at home. Professional experience has shown that factors associated with the hygiene conditions in the household and surroundings and with the caregiver's

educational level, such as the socioeconomic level of the family, influence the efficacy of home dialysis. In addition, the caregiver's knowledge about the technique, his/her access to health care services that are reference for the child care, and the relation between family, children, and health care professionals seem to play an important role in the adequate practice and efficacy of the procedure.

This study aimed at assessing the caregiver's educational level, his/her knowledge about PD practice, family income, and specific conditions of the dialysis site. The existence of an association between inadequate dialysis practice and the variables described was also investigated.

METHOD

This study assessed all children and adolescents with CKD cared for at the Pediatric Nephrology Unit of the Hospital das Clínicas of Universidade Federal de Minas Gerais (HC/UFGM), who were undergoing or had already undergone PD as renal replacement therapy, from May 2004 to March 2006.

All patients had been at least for 3 months on PD at the time of the interview and home visit. This was required to guarantee that the caregiver had already performed the procedure at home several times, being, thus, trained and having already experienced practical difficulties.

The main modalities of PD used for the children and adolescents studied were as follows: 1) Continuous Ambulatory Peritoneal Dialysis (CAPD) – a continuous manual PD, in which the dialysis solution is continuously present in the abdominal cavity, seven days a week; and 2) Automated Peritoneal Dialysis (APD) – can be performed intermittently with nocturnal exchanges by use of an automatic cyler. The APD, usually performed at night, requires one single process of organization, antisepsis, and practice per day. Thus, in APD, the four to five dialytic manual connections of CAPD (infusion, permanence, drainage) daily performed are replaced by a night connection and disconnection in the following morning.

Before starting PD, the caregiver undergoes a strict training with the nurses of the service until being able to perform PD at home. That practice is constantly monitored through monthly hospital and home visits, in addition to medical follow-up, and nutritional and social assistance assessments.

The training for PD practice comprises a theoretical and a practical part. The first provides

information about the following: renal function and its loss or decline; types of treatments and their advantages and disadvantages; function of the peritoneum; care with the catheter, the procedure, and the site of treatment; materials used, and their storage; complications and specific management of each case.

The practical part of the training occurs at the hospital, in an appropriate environment, and is indicated by a doctor. The minimum time required is 15 days, but it depends on the acceptance and learning ability of patients and their families. At first, dialysis is performed by the nurse of the Pediatric Nephrology Unit, assisted by the caregiver. All details relating to hygiene, organization, and procedures to be performed are shown step by step. Later, the caregiver starts to reproduce each step, is carefully evaluated by the nurse, and repeats the procedure until being able to perform it safely at home and with no risk for the patient.

The training is important to strengthen the bond of patients and their families with the Nephrology Unit, the health care team involved, and the treatment.

Data were collected through an interview with the caregiver (the mother in 80% of the cases) and observation of the technique during dialysis practice, both on the occasion of home visit by the nurse researcher. A home visit guide and a questionnaire with closed and open questions were used.

The following aspects were considered for classifying the group studied:

- High and low educational level, low corresponding to four or less years of schooling;
- Assessment of the caregiver's knowledge about the dialysis technique and related items according to the following questions:
 - 1 – What do you know about peritoneal dialysis? What is it for?
 - 2 – What were the instructions provided?
 - 3 – What care procedures require permanent attention?
 - 4 – What should be the aspect of the drained fluid?
 - 5 – When should medical aid be sought?
 - 6 – If you were to instruct anybody, what would you say? (detailed description)

The criteria for classifying the answers were based on the theoretical and practical knowledge of the nurse researcher and specialists (advisers and nurses of the Pediatric Nephrology Unit of the HC/UFGM)

about PD practice. The answers to the questions were classified as follows: a) unsatisfactory: the interviewee did not understand the question, provided a superficial, wrong, or non pertinent answer; and b) satisfactory: detailed and explanatory answer.

The answers were assessed separately by the nurse researcher and the nurses of the Pediatric Nephrology Unit of the HC/UFGM, responsible for training the caregivers and for following up the children and adolescents cared for at the unit. The final result was the mean of the assessments for each case.

- High or low per capita income, low corresponding to one minimum wage or less per person (value of March 2006 in Brazilian currency, R\$ 300.00);

- The condition of the dialysis site was considered favorable or unfavorable, and lack of a sink in the dialysis room was the most specific indicator of unfavorable condition;

- Adequate or inadequate hand antisepsis, and inadequate antisepsis occurred when hand washing (duration and number of times) required for antisepsis was not in accordance with the recommendations for the dialysis modality (CAPD or APD);

- The quality of PD practice was considered adequate or inadequate. It was considered adequate when the caregiver correctly followed the steps of the technique, with no modification, in accordance with the training received at the Pediatric Nephrology Unit of HC/UFGM and the instructions provided during regular home visits, such as:

- choice and use of equipment and materials;
- hand antisepsis;
- way of warming the dialysis fluid for infusion;
- use of facial mask during PD;
- products used for antisepsis of the dialysis catheter;
- destination of the effluent (drained fluid, dialysis product).

STATISTICAL ANALYSIS

The odds ratio for the proposed crossings and confidence interval for each result were calculated. The confidence interval used was 95%. The SPSS (Statistical Package for Social Science) software, version 13.0, was used.

ETHICAL ASPECTS

This study was approved by the Committee on Ethics of the UFGM and the parents and guardians of the children/adolescents provided written informed consent.

RESULTS

CHARACTERISTICS OF THE POPULATION STUDIED

This study comprised 30 children/adolescents, 15 (50%) of the female sex, four (13.3%) with ages ranging from 01 to 04 years, 17 (56.7%) with ages ranging from 05 to 10 years, and nine (30%) over the age of 10 years.

Regarding PD practice, the mother was the only person responsible in 24 (80%) cases. Three other (10%) mothers could count on the father and/or an aunt to help with the procedure, and, in one of such cases (1/3), the patient herself could help, although, according to her mother, she preferred not to perform the task. Two patients (7%) had the father as the person responsible for performing PD, and one (3%) had the grandmother as the person responsible for that task.

Twenty-eight families (93%) studied had an inadequate per capita income, lower than one minimum wage per person (value of March 2006 in Brazilian currency, R\$ 300.00), relying on a Brazilian social benefit program.⁹

The educational level of 22 (73%) main caregivers was over four years of schooling. The caregivers' knowledge about dialysis technique and other aspects relating to CKD, assessed through questions 1, 2, 3, 4, 5, 6, are shown in Table 1.

PERITONEAL DIALYSIS PRACTICE

Regarding the conditions of the site for performing dialysis, 27 (90%) dialysis rooms had sink for hand antisepsis; 22 (73%) caregivers responsible for performing dialysis washed their hands (duration and number of times) according to the instructions provided for the therapeutic modality used.

The quality of the PD practice, represented by the mean of the assessments carried out by the nurse researcher and the nurses of the Pediatric Nephrology Unit of the HC/UFGM responsible for training and following up the caregivers and the children and adolescents, was assessed based on theoretical-practical knowledge. It was considered inadequate in 18 (60%) cases as shown in Table 2.

ASSOCIATIONS BETWEEN THE VARIABLES STUDIED

Based on data collected and the classification of the sample studied, possible associations were sought between the variables shown in Table 3, by use of odds ratio (OR) calculation. All OR values were within the limits of the confidence intervals and were greater than 1, indicating the possibility of a positive

association between the independent variables (low educational level, low income, lack of sink in the PD room, inadequate hand antisepsis, and inadequate knowledge about PD) and the variable studied (worse technical quality), although with no statistically significant difference.

DISCUSSION

CAREGIVER'S KNOWLEDGE ABOUT PD AND RELATED ITEMS

Assessing the caregiver's knowledge about PD and related items was aimed at identifying if they were prepared to care for children/adolescents with CKD.

Table 1 shows that, most of the times, opened questions 1, 2, 3, 4, 5, 6 were adequately answered (overall mean, 81.7%), suggesting good knowledge about CKD, care with the patient, and PD practice by caregivers. That indicates, thus, the good quality of the training provided by the service.

Sometimes the assessment of the caregiver's knowledge is not reliably represented due to obstacles, such as difficulty in self-expression, interviewee's inhibition, not feeling comfortable with the interviewer, hurried answers due to engagement in other obligations and activities.

Theoretical knowledge not always implies practical knowledge, and vice-versa. During the interview, the researcher identified some situations in which the interviewee, despite having more than four basic years of schooling, could not understand well the questions proposed or answered the questions superficially. On the other hand, the researcher could also see that sometimes the caregiver, despite having less than four basic years of schooling, answered the questions correctly and performed dialysis properly.

Many factors are believed to be closely related to the success of therapy, such as: caregiver's commitment; responsible involvement with treatment; blind obedience to the instructions provided; good relationship between the health care team, the patient, and his/her caregiver; family and social support; adequate dietary conditions; adequate personal and household hygiene.

Thus, good general knowledge about PD and its peculiarities can represent a protective factor, contributing to a better quality of the dialysis practice.

Knowledge assessed through questions 3, 5, and 6 as inadequate tends to represent a risk factor for dialysis practice, that is, the quality of dialysis practice referring to those questions has a two to three times greater chance of being inadequate than when the knowledge is adequate.

Table 1

DISTRIBUTION OF THE CAREGIVERS' ANSWERS TO THE QUESTIONS OF COGNITIVE ASSESSMENT CLASSIFIED AS ADEQUATE OR INADEQUATE

| Questions | Inadequate | | Adequate | | Total |
|--------------|------------|------------|----------|------------|---------|
| | n | Percentage | n | Percentage | |
| 1 | 7 | 23% | 23 | 77% | 30/100% |
| 2 | 8 | 27% | 22 | 73% | 30/100% |
| 3 | 5 | 17% | 25 | 83% | 30/100% |
| 4 | 0 | 0% | 30 | 100% | 30/100% |
| 5 | 6 | 20% | 24 | 80% | 30/100% |
| 6 | 7 | 23% | 23 | 77% | 30/100% |
| Overall Mean | 5,5 | 18,3% | 24,5 | 81,7% | 30/100% |

Table 2

QUALITY OF DIALYSIS PRACTICE

| Classification | Assessments | Percentage |
|----------------|-------------|------------|
| Inadequate | 18 | 60% |
| Adequate | 12 | 40% |
| Total | 30 | 100% |

Table 3

ODDS RATIO AND CONFIDENCE INTERVAL OF THE VARIABLES STUDIED AND ASSOCIATION WITH THE QUALITY OF PERITONEAL DIALYSIS PRACTICE

| VARIABLES | Worse Quality of the Technique | |
|--|--------------------------------|--------------|
| | OR | 95% CI |
| Low educational level | 1.15 | 0.21 - 6.09 |
| Low income | 1.54 | 0.08 - 27.35 |
| Lack of a sink in peritoneal dialysis room | 1.37 | 0.11 - 17.09 |
| Inadequate antisepsis | 1.15 | 0.21 - 6.09 |
| Inadequate knowledge about Question 1 | 1.92 | 0.30 - 12.05 |
| Inadequate knowledge about Question 2 | * | * |
| Inadequate knowledge about Question 3 | 3.14 | 0.30 - 32.27 |
| Inadequate knowledge about Question 4 | ** | ** |
| Inadequate knowledge about Question 5 | 1.42 | 0.21 - 9.37 |
| Inadequate knowledge about Question 6 | 1.92 | 0.30 - 12.05 |

OR = Odds Ratio; IC = 95% confidence interval. The observation number is 30.

* There is a blank space. ** Correspond to 30 adequate answers (100%) to the question proposed.

Question 6 also allowed assessing, in addition to the aspects studied through the interviewee's explanation, his/her experience with the practice, his/her flaws and difficulties when performing dialysis.

TECHNICAL QUALITY

Assessing PD technique may seem subjective, but PD practice requires some essential aspects that should be observed and demanded, such as: adequate and hygienic site; organization and cleaning of all material necessary to PD; hand antisepsis (duration and number of times) as recommended according to the PD modality used; opening and closing tap with elbows; use of recommended products for catheter cleaning; use of facial mask; doors and windows of the dialysis room closed; following the steps determined for dialysis modality with no modification or change in order; careful and correct connections of the dialysis equipments; dialysis solution drainage, permanence, and infusion according to the therapy used; obedience to the prescription of number of dialysis exchanges in CAPD and cycles in APD; effluent disposed down the drain or flushed down the toilet. Lastly, caregivers and patients with long hair are instructed to hold it back with a hair net, to avoid hair contact with any material or catheter during the procedure.

In addition, the conditions and place of storage of dialysis bags were assessed, because humid, dusty, dirty or moldy conditions may jeopardize the quality of the products, representing a risk for the patient's health. Both theoretical and practical knowledge about that topic can also be assessed, and especially the caregiver's commitment, involvement, and responsibility in the case of pediatric patients.

Such aspects guided the assessment of the quality of dialysis practice by the researcher nurse and nurses of the service, aiming at minimizing mistaken and/or personal interpretations and enriching the investigation.

Table 3 shows the tendency of the following variables to be risk factors for the quality of dialysis practice: caregiver's low educational level; low familial per capita income; inadequate caregiver's knowledge about dialysis practice (assessed through questions 1, 2, 3, 4, 5, and 6); inadequate hand antisepsis (duration and number of times) according to the therapeutic modality used; and lack of a sink for hand washing in dialysis room. However, no statistically significant association was found between the parameters studied.

That tendency strengthens the hypothesis of the need to improve those aspects aiming at enhancing the health conditions and quality of life of those patients.

CONCLUSIONS

Despite the lack of statistical difference in the analysis of independent variables as risk factors for the variable studied, the following variables are believed to play a positive role in the success of dialysis practice: educational level higher than four basic years of schooling; adequate theoretical-practical knowledge about PD and CKD; familial income greater than one minimum wage (R\$ 300.00) per person; adequate site for PD practice; and strict obedience to the instructions provided about dialysis practice.

REFERENCES

1. Lima EM, Diniz JSS. Insuficiência Renal Crônica. In: Leão E, Viana MB, editores. *Pediatria Ambulatorial*. 3ª ed. Belo Horizonte: Coopmed. 1998,pp. 535-544.
2. Balfe JW, Viginea A, Williamson J *et al*. The use of CAPD in the treatment of children with end-stage renal disease. *Perit Dial Bull*. 1981; 1:35-38.
3. Verrina E, Perfumo F. Technical aspects of the peritoneal dialysis procedure. In: Warady BA, Schaefer FS, Fine RN, Alexander SR. (eds.). *Pediatrics Dialysis*. Dordrecht, Kluwer Academic Publishers. 2004, pp.113-134.
4. Diaz-Buxo JA. Automated peritoneal dialysis. A therapy in evolution. In: Ronco, C. Amici, G. Feriani, M. Virga, G. (eds.). *Automated Peritoneal Dialysis*. Basel: Karger. 1999, pp. 1-14.
5. Lerner GR, Warady BA, Sullivan EK, Alexander SR. Chronic dialysis in Children and adolescents. The 1996 annual report of the North American Pediatric Renal Transplant Cooperative Study. *Pediatr Nephrol*. 1999; 13:404-17.
6. Hickman RO. Nine years experience with chronic peritoneal dialysis in childhood. *Nephrol Dial Transplant*. 1978; 7:803.
7. Lorentz WB, Hamilton RW, Disher B *et al*. Home peritoneal dialysis during infancy. *Clin Nephrol*. 1981; 15:194-7.
8. Waraby BA, Fivush BA, Alexander SR. Peritoneal dialysis. In: Barratt TM, Avner ED, Harmon WE, editors. *Pediatric Nephrology*, 4th ed. Baltimore, MD: Lippincott Williams and Wilkins. 1999,pp. 1251-65.
9. Previdência Social. Tudo o que você quer saber sobre a previdência social. 2ªed. Brasília: MPAS/ACS. 2002, pp. 97-100.