Sundhedsstyrelsen
National Board of Health

Danish Centre for Evaluation and Health Technology Assessment

DIALYSIS IN CHRONIC RENAL FAILURE

A health technology assessment – summary

Health Technology Assessment 2006; 8 (3)

Dialysis in Chronic Renal Failure – a Health Technology Assessment

URL: http://www.sst.dk

Key words: Health Technology Assessment, HTA, dialysis, end stage renal disease, chronic renal failure, self care, haemodialysis, home dialysis, peritoneal dialysis

Language: Danish, with an English summary

Format Pdf
Version: 1,0
Version date: November 20, 2006

Published by: National Board of Health, Denmark, December 2006

Category: Guidance

Design: National Board of Health and 1508 A/S
Layout: P.J. Schmidt Grafisk

ISBN (electronic version): 87-7676-394-3
ISSN (electronic version): 1399-2481

This report should be referred as follows:
National Board of Health, Danish Centre for Evaluation and Health Technology Assessment
Dialysis in Chronic Renal Failure – a Health Technology Assessment
Copenhagen: National Board of Health, Danish Centre for Evaluation and Health Technology Assessment, 2006
Health Technology Assessment 2006; 8(3)

Series Title: Danish Health Technology Assessment
Series Editorial Board: Finn Børlum Kristensen, Mogens Hørder, Leiv Bakketeig

For further information please contact:

National Board of Health
Danish Centre for Evaluation and Health Technology Assessment
Islands Brygge 67
DK-2300 Copenhagen
Denmark
Phone: +45 72 22 75 48
E-mail: dacehta@sst.dk
Home page: www.dacehta.dk

The publication can be down-loaded free of charge at www.dacehta.dk

Summary

Introduction

More than a doubling of the number of patients in dialysis treatment was registered in Denmark during the last 10 years (1). Among other things, this is due to the fact that an increasing number of elderly patients and an increasing number of patients with serious secondary diagnoses are offered dialysis (2). The increase in the number of patients results in increased pressure on the dialysis centres, and thus it is necessary to consider if a reorganisation of dialysis treatment is possible in order to relieve the centres. At the same time, it is relevant to assess the influence of the dialysis patients on the choice of treatment when they start or when they already receive dialysis treatment.

Chronic renal failure is a life-threatening disease for which the life-saving treatment is dialysis or – when possible – kidney transplantation. A maximum of 20% are eligible to have kidney transplantation, and of this number only some are interested in accepting the offer. The lifetime of a transplanted kidney is not lifelong, so for some patients the need for dialysis will return.

With the increasing pressure expected in future on the dialysis treatment programme, the increase in the proportion of patients in centre dialysis (1) and the diversities observed within the offer for treatment, it is relevant at this point in time to clarify whether more patients could be dialysed in "out-going treatment". It is primarily elderly patients (>60 years), who account for the increase in the number of dialysis patients. These patients often have other underlying diseases that have caused chronic renal failure. An interesting question is thus, whether it would, from a clinical and patient point of view, be sound and possible to transfer some of these patients to outgoing dialysis? What are the organisational and economic consequences if a larger part of the patients transfer to outgoing treatment. As a number of elements must be assessed, the natural choice of method fell on a health technology assessment, since such an assessment comprises all these elements.

Dialysis is traditionally seen as hospital treatment, but to a large extent, the treatment already takes place at home (3).

Dialyses methods

- Haemodialysis (HD) at centre or at home
  - Dialysis at centre (CHD)
  - Dialysis at home (HHD). Capable patients
  - Self-care dialysis at centre with reduced staff consumption and capable patients.
- Peritoneal dialysis (PD) takes place at home
  - Continuous peritoneal dialysis (CPD)
  - Automatic dialysis during the night (APD)
  - Assisted APD. Care staff trained to assist with the dialysis.

Out-going treatment comprises HHD, self-care and all forms of PD, as these methods function with either capable patients or minimum assistance for dialysis.

Objective

To investigate whether the number of patients with chronic renal failure on outgoing dialysis can be increased with a positive effect.

Summary in: Sundhedsstyrelsen, Center for Evaluering og Medicinsk Teknologivurdering. Dialyse ved kronisk nyresvigt – kan antallet af patienter i udgående dialyse øges? En medicinsk teknologivurdering. Medicinsk Teknologivurdering 2006; 8(3). København: Sundhedsstyrelsen, Center for Evaluering og Medicinsk Teknologivurdering, 2006. p 15-19. Full length pdf at www.cemtv.dk

Methods and Results

The analysis has comprised both literature reviews and interview studies with patients and staff. Generally, the present international publications have contained relatively little material and only few randomised controlled studies or systematic reviews. Further, the analysis includes a health-economic assessment of the various forms of dialysis and expected scenarios in relation to an increase in outgoing dialysis.

Technology

Based on literature and Danish registry data, an assessment has been made as to whether there is a difference in the treatment efficiency of the various methods, including a review of the various forms of dialysis. In international literature there is evidence that PD patients compared to CHD patients have the same survival rate, while the survival rate for Danish PD patients apparently is superior for the first 1.5 years after starting the dialysis, except for patients with diabetes as well as for elderly patients over 55 years, for whom the survival rate is the same. After dialysis treatment for 1.5 years the survival rate for PD and CHD patients is the same. This indicates that the majority of the patients can benefit from starting the dialysis treatment as PD unless there are contraindications or social factors to choose CHD as the first treatment method.

Contraindications are relevant for only approx. 35% of the patients, and this is primarily the contraindication to PD. By contrast, the preferences of the department/physician seem to play an important role in the choice of form of dialysis, while the preferences of the patient often depend on the options given and the patient's way of dealing with his chronic disease. Also the time of the referral is of great importance in relation to the choice. Patients referred too late with a need for acute or subacute start of dialysis shortly after the referral to the specialist nephrologic centre are more inclined to end up with CHD than with outgoing dialysis. Also, the actual capacity for CHD is very important. Lack of capacity for CHD will mean that more patients end up with outgoing dialysis treatment.

A number of basic requirements must be met for dialysis to be performed at home or as self-care. A training period of minimum 6 weeks is necessary, concluded by a home visit with a review by a technician clarifying practicalities, as well as help to install the dialysis at home. If it is a matter of PD at home there must also be sufficient room for storage of dialysing fluids, various utensils as well as the possibility of handling a considerable amount of waste. In principle, training for APD is like CAPD, however with special emphasis on how the machine works and how to attach and uncouple the machine. It is important that an assessment of the care requirement and of the workplace is carried out before offering assisted APD. Furthermore, a thorough training of the involved nurses/health care staff is required. For all forms of outgoing dialysis it is important for the method to work that there is easily accessible supportive care and technical assistance.

Patient

As mentioned above both clinical factors, the preferences, recommendations and training of the professionals and the preferences of the patients influence the choice of dialysis method, but there must be a genuine offer of outgoing dialysis methods. If the number of patients on outgoing dialysis treatment is to be increased, referral to a specialist nephrologic centre must take place so early so that the patient can be offered training, information and preparation of dialysis. The duration of the predialysis period is important for whether the patient is informed and involved in the choice of dialysis method. It is also important who gives the information and how it is done. Patients, who had received information and participated in predialysis training, chose significantly more frequently an outgoing dialysis method than the patients who had not received information or

training. Flexibility, including the possibility of planning the dialysis time and frequency oneself, the possibility of continuing to work, the possibility of doing other things at the same time or planning the dialysis at a time of day where it does not take time from other activities, is a motivation for choosing an outgoing dialysis method. Less time spent, for instance avoiding transport to the dialysis centre, is a motivation for choosing an outgoing dialysis method, and a possibility of increased dialysis time is to some extent a motivation for choosing an outgoing dialysis method. For patients in CHD it is essential to have some flexibility as to where and when the dialysis is to take place, which together with an offer of increased dialysis time, may motivate patients to take part in the treatment themselves in the form of self-care.

Focus-group interviews with patients on different dialysis methods and their relatives, as well as patients with renal diseases and their relatives, have confirmed that if more patients in the future are to choose outgoing dialysis treatment, there must be a genuine offer of information of pros and cons in relation to the various dialysis methods as early in the course as possible. Not all patients wish to have the choice, but the patients given a choice more often select an outgoing dialysis method.

There is no clear evidence that there is any difference in quality of life and self-assessed health for patients on the various dialysis methods. Age, comorbidity and the way in which patient and relatives are able to deal with the disease and the treatment are important for the extent to which they are challenged by disease and dialysis treatment. Since dialysis treatment fundamentally changes everyday life for both the patient and the family it is important that the treatment is fitted into everyday life so that patient and family can maintain their normal existence as far as it is possible to do so. As many patients wish to maintain the possibility of continuing to work this is also important when the patients choose a dialysis method.

The patients and their relatives state a number of advantages and disadvantages in relation to the various dialysis methods. Transport time and waiting time for transport are mentioned as disadvantages in connection with CHD. Motivation for choosing an outgoing dialysis method is flexibility, including the possibility of planning the dialysis time and frequency oneself, the possibility of continuing to work, the possibility of doing other things at the same time or planning the dialysis at a time of day when it does not take time from other activities. A significant disadvantage of PD is space factors and of HHD it is noise.

The patients are often satisfied with their present dialysis method and are not especially motivated to change this.

Organisation

There are 14 dialysis centres in Denmark, one in every county and one in the area of the Copenhagen Hospital Corporation (H:S). In addition, 8 dialysis centres have a dialysis satellite attached, i.e. a dialysis unit physically located in another hospital but with the dialysis centre having the medical responsibility. Even though these 14 centres perform the same task and thus in many ways are similar there are organisational differences between the centres. These differences may be important for the centres' proportion of patients on outgoing dialysis and for the possibilities and challenges they are faced with if they are to expand the possibilities of treating more patients on outgoing dialysis.

All dialysis centres offer CHD, HHD and PD. In addition to the three dialysis methods just over half the centres offer self-care dialysis. Half the centres to a certain extent also offer assisted APD to the patients in cooperation with the home care. Generally, the centres await a clarification on which economic agreements can be concluded with the municipalities concerning this method of dialysis.

In connection with an effort to ensure an increased proportion of the patients on outgoing dialysis, the duration of predialysis time is of the utmost importance. Timely referral requires knowledge and awareness of nephrology in other specialties and units as well as the preparation of a clear-cut strategy for predialysis and time of referral, information, choice of dialysis method and placement of access.

Within the nephrologic area there is a lack of coordination and cooperation between the HD and PD areas. There is a need for a holistic focus as well as knowledge and confidence-inspiring initiatives and approaches, for instance in the form of competence development of nurses; and there is a need for all professional groups to gain insight into all the various forms of dialysis. There is a need for a joint understanding and for creating common measures and strategy for the entire nephrologic area, which are communicated clearly to all involved. It is crucial to avoid the assumption that the start of acute dialysis automatically means that the dialysis method will be CHD.

Regarding HHD, there is a need for a clarification of the economics in relation to pricing, a managerial awareness of the need for primary investments, for aiming at self-determination in some HHD offers about when and how often to dialyse, and for ensuring flexibility in the training schedule. If the proportion of HHD patients is to be increased there is a need for sufficient HHD competences in the outpatient clinic as well as sufficient backup and relief options at the regional centre, additional technical resources for controls at home and competences for technicians in order that they can meet the need for support at home.

If the proportion of PD patients is to be increased, earlier planning and coordination of placement of access is necessary, as are increased awareness of waiting times and their consequences. There must be better opportunity to offer adequate, individual support to the patients during the start-up phase, for instance in the form of additional home visits. There must be sufficient resources in the outpatient clinic and competences in the wards to provide backup to the patients as well as timely considerations, information and decision on the choice of a new dialysis method, when PD is no longer possible.

In connection with assisted APD a clarification of the economic situation between hospital and municipality is necessary. It is important that an assessment of the care requirement and of the workplace is carried out before offering assisted APD, including guidelines on which factors to assess where, when and by whom. Specialised training material and programme should be prepared at the dialysis centre and there should be sufficient resources both at the centre and in the municipality to train and update the knowledge and competences of the home carers.

For all outgoing forms it is important to have a common cross-sectional culture in which the centre still feels responsible for the patient.

Economy

Data from the Danish Society of Nephrology's national registry – which also forms the basis for the model calculations of this analysis – show that the prevalence of chronic renal failure and thus the number of patients in dialysis is increasing. This makes certain demands in terms of capacity to the nephrologic units in the years to come, for which reason the objective of the economic analysis is to assess the consequences of more patients receiving outgoing treatment. The applied methods are a systematic literature review to assess the international development in this area and a model analysis of the economic consequences of different relative distribution of dialysis methods in Denmark.

No significant differences are evident in differences of life expectancy between the various dialysis methods. This means that a larger proportion of patients in outgoing treatment will have no effect

in the form of increased life expectancy. Thus, this analysis is limited to cost considerations where the development in patient number and distribution as well as the development in costs is simulated over a period of 10 years. The cost estimates – comprising predialysis, start-up costs, annual dialysis costs and costs in connection with complications – are primarily based on rates and in certain cases on local cost calculations. This cost analysis includes the costs of the hospital service, including transport costs (paid for by the hospitals), and of care staff in the municipalities in connection with assisted APD. Other costs of patients or relatives and any production gains/losses to society are not included.

In the economic model – based on a Markov approach – change of dialysis method, exit to transplantation or death as well as entry of new patients over a period of 10 years is simulated. The results show that if the proportion of patients in outgoing treatment rises from 30% to 40–45% over a period of 10 years, it will bring about a cost-saving potential of approx. DKK 68 million. The costs will rise annually due to an increasing number of patients, but the total costs of increased outgoing treatment will rise less than at the baseline scenario. The results of the sensitivity analyses indicate the uncertainty of this result. However, the conclusion must be that an increase in the proportion of dialysis patients in outgoing treatment will bring about a cost-saving potential.

Conclusions

Based on these analyses it is estimated that there is a potential to increase the number of patients on outgoing dialysis, and it may be possible to increase the number from the present 30% to approx. 45%. Primarily, the potential is in increasing the proportion of patients in self-care and PD, including assisted APD, but it is also expected that the number of patients in HHD can be increased. It makes increased demands on the patients having the necessary information and being given a say in the choice of treatment method. At the same time, it is, however, important to emphasise that the patients are not to be forced into outgoing dialysis, as in addition to possible clinical contraindications there may be strong social reasons for patients preferring CHD. Furthermore, the report indicates a number of organisational challenges, if the outlined growth in the proportion of patients is to be managed. Additional patients in outgoing treatment may result in a cost-saving potential of approx. DKK 68 million.

Overall recommendations:

- Increased effort to have GP's and relevant hospital units referring patients with progressing chronic renal disease in the early stages of the disease
- Improved preparation of the patient for dialysis treatment with clarifying information about dialysis methods
- Guidelines for start of dialysis and subsequent dialysis method
- Better possibilities of assistance at home for APD
- Clarification of the economic responsibility in connection with assisted APD
- Exchange of knowledge and holistic nephrologic competence development for nurses
- Joint awareness and strategies within the entire nephrologic area
- Prioritise that patients have lower time consumption in dialysis as well as increased freedom and flexibility.

Summary in: Sundhedsstyrelsen, Center for Evaluering og Medicinsk Teknologivurdering. Dialyse ved kronisk nyresvigt – kan antallet af patienter i udgående dialyse øges? En medicinsk teknologivurdering. Medicinsk Teknologivurdering 2006; 8(3). København: Sundhedsstyrelsen, Center for Evaluering og Medicinsk Teknologivurdering, 2006. p 15-19. Full length pdf at www.cemtv.dk