Health Policy 110 (2013) 172–179

Contents lists available at SciVerse ScienceDirect

Health Policy

journal homepage: www.elsevier.com/locate/healthpol

Analysis of the costs of dialysis and the effects of an incentive mechanism for low-cost dialysis modalities

Irina Cleemput[a,b,*], Chris De Laet[a]

[a] Belgian Healthcare Knowledge Centre (KCE), AC Kruidtuin, Doorbuilding (10th floor), Kruidtuinlaan 55, 1000 Brussels, Belgium
[b] Hasselt University, Faculty of Business Economics – Policy Management, Campus Diepenbeek, Building D, Agoralaan 1, Room B52, 3590 Diepenbeek, Belgium

ARTICLE INFO

Article history:
Received 22 September 2012
Received in revised form 26 February 2013
Accepted 4 March 2013

Keywords:
Costs and cost analysis
Dialysis
Economics
Reimbursement
Incentive
Health policy

ABSTRACT

Background: Treatment costs of end-stage renal disease with dialysis are high and vary between dialysis modalities. Public healthcare payers aim at stimulating the use of less expensive dialysis modalities, with maintenance of healthcare quality.
Objectives: This study examines the effects of Belgian financial incentive mechanisms for the use of low-cost dialysis treatments.
Methods: First, the costs of different dialysis modalities were calculated from the hospital's perspective. Data were obtained through a hospital survey. The balance between costs and revenues was simulated for an average Belgian dialysis programme. Incremental profits were calculated in function of the proportion of patients on alternative dialysis modalities.
Results: Hospital haemodialysis is the most expensive modality per patient year, followed by peritoneal dialysis and finally satellite haemodialysis. Under current reimbursement rules mean profits of a dialysis programme are maximal if about 28% of patients are treated with a low-cost dialysis modality. This is only slightly lower than the observed percentage in Belgian dialysis centres in the same period.
Conclusions: In Belgium, the financial incentives for the use of low-cost dialysis modalities only had a modest impact due to the continuing profits that could be generated by high-cost dialysis. Profit neutrality is crucial for the success of any financial incentive mechanism for low-cost dialysis modalities.

1. Introduction

Renal Replacement Therapy (RRT) is a life-saving and highly effective supportive treatment for patients with end stage renal disease (ESRD). There are essentially two types of RRT: dialysis and renal transplantation. Renal transplantation is considered the treatment of choice, because it offers a better outcome at lower costs. However, not all patients are eligible for renal transplantation and most eligible patients have to wait before a suitable kidney becomes available. These patients are treated by means dialysis. Table 1 describes the most frequently used dialysis modalities.

Satellite haemodialysis (HD) and peritoneal dialysis (PD) are both lower-care – i.e. requiring no or less attendance of medical personnel – and thus less costly dialysis modalities compared to hospital HD [1,2]. They are referred to as "alternative dialysis modalities" throughout this article. PD is claimed to better preserve the residual renal function in patients than HD [3]. Therefore it is often considered to be the preferred initial dialysis treatment. However, complications may occur. Peritonitis is the major cause of PD technique failure resulting in a transfer to HD.

* Corresponding author at: Belgian Healthcare Knowledge Centre (KCE), AC Kruidtuin, Doorbuilding (10th floor), Kruidtuinlaan 55, 1000 Brussels, Belgium. Tel.: +32 2 287 33 88; fax: +32 2 287 33 85.
E-mail addresses: Irina.Cleemput@kce.fgov.be, Irina.cleemput@uhasselt.be (I. Cleemput), Chris.Delaet@kce.fgov.be (C. De Laet).

0168-8510/$ – see front matter © 2013 Elsevier Ireland Ltd. All rights reserved.
http://dx.doi.org/10.1016/j.healthpol.2013.03.001

Table 1
Dialysis modalities.

Dialysis modality	Acronym	Description
Haemodialysis in a hospital setting	Hospital HD	Full-care (high-care) haemodialysis in a hospital or equivalent centre, with full assistance by nephrologists and nursing personnel. Hospital HD typically occurs three times a week.
Haemodialysis in a satellite unit associated with a main dialysis centre	Satellite HD	Mainly low-care haemodialysis (sometimes called self-care HD) where part of the necessary manipulations are done by the patient, with a lower attendance of nephrologists and nursing personnel. Satellite HD typically occurs three times a week.
Peritoneal dialysis:	PD	Peritoneal dialysis uses the peritoneal membrane as a semi-permeable membrane, instead of an artificial membrane as in HD. There are two main categories of PD: continuous ambulatory peritoneal dialysis (CAPD) and automated peritoneal dialysis (APD). CAPD uses, in contrast to APD, no machinery for the delivery and drainage of the dialysis fluids. PD occurs daily at home.
• Continuous ambulatory peritoneal dialysis	• CAPD	
• Automated peritoneal dialysis	• APD	

Dialysis is an expensive treatment. Total expenditures for dialysis treatment increase every year, mainly due to the growing population on RRT. The highest growth rates are seen in the elderly. In Belgium, for instance, the population of patients older than 65 years of age grew by 40% between 2002 and 2007, compared to 26% overall [4]. With the aging population, the pressure of chronic dialysis on healthcare budgets continues to increase. In this respect, the optimal use of lower-cost dialysis modalities becomes increasingly important.

Medical indications and contra-indications for specific dialysis modalities are mainly based on expert opinion and consensus [5,6] and are lacking for the majority of patients (64% according to a large Dutch multicentre cohort study [7]). The effectiveness of all modalities is equal in those patients. In the absence of specific (contra-)indications, patients' preferences and capability to strictly adhere to the treatment become more important in the choice of dialysis modality [8]. Empirical studies suggest that the choice for PD is mainly determined by the expected flexibility, independence, better social life and reduced transport time. Satellite HD is often preferred because of reduced waiting times when starting a dialysis session and more flexible treatment hours. Hospital HD is chosen because of the higher sense of security and the dialysis-free days [9,10]. The weighing of the advantages and disadvantages of different dialysis modalities depends on the patient's character and attitude (e.g. ability to take responsibility for own treatment) and social status (e.g. living alone, with a partner or with adult children). Social support from a partner or informal caregiver is an important but not sufficient condition for choosing a home dialysis modality. Active, younger patients or students tend to prefer PD, home HD or evening/night HD as initial dialysis treatment. But also pre-dialysis counselling was found to be an independent predictor for choosing PD over HD [10].

This is an important message for public payers, who might want to reduce the pressure on public healthcare resources by increasing the relative use of lower-cost dialysis modalities.

Belgium introduced financial incentive mechanisms to increase the use of satellite HD and PD in 2005.

Belgian hospital financing has a dual structure: accommodation, nurses, operating room and sterilisation are financed via a fixed prospective budget, while physicians, polyclinics, medico-technical services (laboratories, medical imaging and technical procedures) and paramedics are mainly paid through fee-for-service [11]. For hospital HD, hospitals receive a lump sum and physicians a fee-for-service per dialysis session. Alternative dialysis modalities are reimbursed by means of a lump sum per week to the hospital only.

The government aimed at increasing the proportion of patients on alternative dialysis modalities by increasing the lump sum for hospital HD with a variable amount depending on the proportion of ESRD patients treated with alternative dialysis modalities. The lump sum bonus increased up to the point where 35% of the patients are treated with one of the alternative dialysis modalities and remains constant afterwards. Financing of the alternative dialysis modalities remained unchanged. Despite the incentives, the use of PD remained limited in Belgium, compared to other countries [9].

This study unravels the financial consequences for the providers (hospitals and physicians) of the financial incentive policy in Belgium and estimates the optimal mix – from a financial point of view – of hospital HD and alternative dialysis modalities under these financing conditions. This estimate is then compared to the actual mix observed in Belgium. As hospitals in Belgium are not-for-profit institutions, the proportion of patients treated with alternative dialysis modalities should not be driven by profit maximisation. Nevertheless, allowing a profit for hospital HD, conditional upon the use of alternative dialysis modalities, can be an effective financial incentive. However, if profits are made on all modalities, and differ between them, the financial incentive mechanism may not have the hoped for effect. If the financial incentive is found to be (unintended) stronger for one modality than for another, the incentive mechanism may have to be refined.

2. Materials and methods

We first calculated the costs of the different dialysis modalities from the hospital's point of view and then simulated the balance between the costs and revenues of a dialysis programme in function of the proportion of patients on alternative dialysis modalities, given the financing. For the ease of interpretation, we simulated a programme with 100 dialysis patients.