

ORIGINAL ARTICLE

Comparison of Cost-Utility Between Automated Peritoneal Dialysis and Continuous Ambulatory Peritoneal Dialysis

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Background and Aims. The use of automated peritoneal dialysis (APD) is increasing compared to continuous ambulatory peritoneal dialysis (CAPD). Surprisingly, little data about health benefits and cost of APD exist, and virtually no information comparing the cost-utility between CAPD and APD is available. We undertook this study to evaluate and compare the health-related quality of life (HRQOL) and cost-utility indexes in patients on CAPD vs. APD.

Methods. This was a prospective cohort of patients initiating dialysis (2008–2009). Two questionnaires were self-administered: European Research Questionnaire Quality of Life (EQ-5D) and Kidney Disease Quality of Life (short form, KDQOL-SF, Rand, Santa Monica, CA). Direct medical costs (DMC) were determined from the health provider perspective including the following medical resource utilization: outpatient clinic/emergency care, dialysis procedures, medications, laboratory tests, hospitalization, and surgery. Cost-utility indexes were calculated dividing total mean cost by indicators of the HRQOL.

Results. One hundred twenty-three patients were evaluated: 77 on CAPD and 46 on APD. Results of the EQ-5D and KDQOL-SF questionnaires were significantly better in APD compared to the CAPD group. Main costs in both APD and CAPD were attributed to hospitalization and dialysis procedures followed by medication and surgery. Outpatient clinic visits and laboratory tests were significantly more costly in CAPD than in APD, whereas dialysis procedures were more expensive in the latter. Cost-utility indexes were significantly better in APD compared to CAPD.

Conclusions. A significant cost-utility advantage of APD vs. CAPD was observed. The annual DMC per-patient were not different between groups but the HRQOL was better in the APD compared to the CAPD group. © 2013 IMSS. Published by Elsevier Inc.

Key Words: Direct medical costs, Cost-utility index, Utilities, Quality of life, Continuous ambulatory peritoneal dialysis, Automated peritoneal dialysis.

Introduction

During the last decades the incidence and prevalence of end-stage renal disease (ESRD) has impressively increased in Mexico (1) and is expected to double every 8–10 years (2). The important increase in prevalence of diabetes mellitus, hypertension, obesity and other causes of ESRD will worsen this picture (3).

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The increase in the number of ESRD-treated patients is associated with markedly higher utilization of resources and costs. In the U.S., for example, the cost of ESRD treatment was 32.9 billion dollars in 2010 (1). In Mexico, health care is provided by different systems: The Mexican Institute of Social Security (IMSS) is the major health provider covering approximately 40% of the total population (43 million persons) (4); approximately 80% of patients on renal replacement therapy are covered by the IMSS (5). In the IMSS, ESRD is the third most costly disease only after diabetes and hypertension: it consumes about USD 917 million/year (representing 16% of the main budget) expended in only 1.4% of the insured population with ESRD (2).

In Mexico, more than half of ESRD patients are currently treated with peritoneal dialysis (PD) (1). Of these, 40% are on automated peritoneal dialysis (APD) and 60% on continuous ambulatory peritoneal dialysis (CAPD). Since its local introduction in 1998, APD has been growing at an annual rate of ~10% (5). From the clinical point of view, APD and CAPD have similar results (1,6,7) [with certain APD advantage in some cases (8,9)].

In spite of the improvements in ESRD treatment, the health-related quality of life (HRQOL, Rand, Santa Monica, CA) is much lower in these patients than for the general population (10,11). The assessment of HRQOL can help to identify ways to improve the well-being of ESRD patients and potentially to identify strategies to prevent adverse outcomes (12,13). Many papers reporting HRQOL in PD have been published (14–16); however, it is surprising that little data on APD exist, and virtually no information on the comparison of cost-utility between CAPD and APD is available.

Health economics evaluations frequently consider only direct medical costs (DMC), which are those generated by the medical intervention per se; however, they do not consider other benefits useful for the patient on PD as HRQOL. A more complete vision may be obtained by including both variables: cost and utility (17). From the point of view of health administrators and decision takers, it is imperative to identify both quality of life (QOL) and cost indicators to meet the projected increasing of ESRD demand and the best QOL.

We have recently shown that DMC between CAPD and APD are not significantly different (18). However, the balance between additional health benefits for each modality of PD was not assessed. Therefore, the present study was designed to evaluate and compare the HRQOL and cost-utility indexes in patients on CAPD vs. APD.

Patients and Methods

A cohort of adult patients initiating PD between January 2008 and December 2009 in two General Hospitals (Hospital General de Zona No. 14 and Hospital General Regional No. 110), IMSS, Guadalajara, was prospectively analyzed. Patients were excluded if they had cancer, AIDS, mental

disability or advanced heart or liver disease. Subjects were randomly selected (by a computer-generated randomization list) from a total of 434 and 94 patients initiating CAPD or APD, respectively, during the study period. All patients had a 1-year follow-up.

Measurement of Health-related Quality of Life

Two generic questionnaires were employed to measure QOL: The European Research Questionnaire Quality of Life (EuroQol, EQ-5D) (19) and the Kidney Disease Quality of Life (KDQOL, short form, v.1.3, KDQOL-SF) (20). Both questionnaires have been validated in a Mexican population (21,22), and were self-administered to all patients after they accepted to participate.

EQ-5D

The EQ-5D is a validated generic questionnaire including a classification system (EQ-5D profile) and a visual analogue scale (EQVAS) (19,23). The EQ-5D profile records the level of self-assessed problems in five domains of health (mobility, self-care, usual activities, pain/discomfort, anxiety/depression), each with 3 levels: 1 = no problems; 2 = some problems; 3 = unable to perform/extreme problems. An EQ-5D score of 1.0 represents perfect health and 0 death. The second part of the EQ-5D is a visual analogue scale (VAS). For the EQVAS, patients were presented with a vertical line with end points of “worst imaginable health” at 0 and “best imaginable health” at 100. The respondents were asked to mark the point on the scale that corresponded to the rating of their current health status. The VAS score was obtained by dividing the number marked on the scale by 100, which is between 0 and 1.0.

KDQOL-SF

The KDQOL combines the generic SF-36 with a kidney disease-specific instrument (20). The SF-36 instrument measures eight domains of functioning and well-being on a 100-point scale (the higher the scale the better the patient's HRQOL): a) physical functioning, b) role limitations caused by physical problems, c) pain, d) general health, e) energy/fatigue, f) emotional well-being, g) role limitations caused by emotional problems, and h) social function. Results from the SF-36 instrument are further summarized into a physical composite summary (PCS) score and a mental composite summary (MCS) score using the RAND scoring algorithm (20). The PCS aggregates items from physical functioning, role-physical, bodily pain, general health, vitality, and social functioning. The MCS aggregates items from role-emotional, mental health, and includes elements of general health, vitality, and social functioning. In the general population, the mean for each summary scale is 50 points, with a standard deviation of 10 points.

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