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Narrative Review

Peritoneal Dialysis–First Policy Made Successful: Perspectives and Actions

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Peritoneal dialysis (PD) represents an important but underused strategy for patients who are beginning dialysis treatment worldwide. The development of a health care model that encourages increased use of PD is hampered by a lack of expertise and absence of pragmatic strategies. This article provides a brief review of a PD-first initiative that was implemented in Hong Kong more than 25 years ago and issues related to this policy. Clinical studies and research by the authors' and other teams around the world have shown evidence that, as a home-based dialysis therapy, PD can improve patient survival, retain residual kidney function, lower infection risk, and increase patient satisfaction while reducing financial stress to governments by addressing the burden of managing the growing number of patients with end-stage renal disease. Achieving a successful PD-first policy requires understanding inherent patient factors, selecting patients carefully, and improving technique-related factors by training physicians, nurses, patients, and caregivers better. Dialysis centers have the important role of fostering expertise and experience in PD patient management. Dialysis reimbursement policy also can be helpful in providing sufficient incentives for choosing PD. However, despite successes in improving patient survival, PD treatment has limitations, notably the shortcoming of technique failure. Potential strategies to and challenges of implementing a PD-first policy globally are discussed in this review. We highlight 3 important elements of a successful PD-first program: nephrologist experience and expertise, peritoneal dialysis catheter access, and psychosocial support for PD patients.
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INDEX WORDS: Dialysis; economics; hemodialysis; peritoneal dialysis; renal replacement therapy; residual renal function; survival; technique failure; Tenckhoff catheter.

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The rapidly expanding global population of dialysis patients represents a public health challenge that the current availability of organ transplantation cannot meet.[1] The majority of patients with end-stage renal disease (ESRD) rely on dialysis therapy to stay alive; however, the pattern of dialysis modalities varies substantially among different countries. There are still misconceptions that "peritoneal dialysis [PD] is for poorer countries."[2] Recently, Jain et al[3] studied longitudinal data from 130 countries from 1996 to 2008 and found that the number of PD patients increased in developed countries by 21.8 patients per million population and in developing countries by 24.9 patients per million population. However, the proportion of patients treated with PD declined substantially (by 5.3%) in developed countries, whereas it did not change in developing countries.[3] This review discusses why a PD-first policy should be advocated and recommends strategies for successfully increasing the use of PD.

PD AS A PREFERRED OPTION IN INCIDENT DIALYSIS PATIENTS

Patient Survival

Does PD give an inherent survival advantage in comparison to hemodialysis? To address this question, prospective cohort comparative studies and registry data frequently are used to examine the mortality risk in patients who receive PD and hemodialysis[4-16] (Table 1). The inherent methodological difficulties with the design, and hence interpretation, of such comparative studies have been discussed in good detail recently.[17-20] An important observation documented in these large-scale studies was the initial survival advantage of patients who received PD during their first 1-2 years of dialysis treatment.[4,5,7,10]

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Table 1. Mortality Comparison of Incident Adult Dialysis Patients Treated With PD and Hemodialysis

Study	Population	Impact on Patient Survival	Subgroup Analysis	Remarks
Fenton et al[4] (1997)	11,970 CORR patients (1990-1994)	Significantly lower mortality for PD (aHR, 0.73; 95% CI, 0.68-0.78)	Survival advantage from PD first 2 y only; lower survival advantage for patients aged >65 y or diabetic	—
Heaf et al[5] (2002)	4,921 DSN TUR patients (1990-1999)	Significantly lower mortality for PD (aRR, 0.65; 95% CI, 0.59-0.72)	Survival advantage from PD first 2 y only	—
Jaar et al[6] (2005)	1,041 CHOICE Study patients (1995-1998)	No difference in mortality (aHR, 1.39; 95% CI, 0.64-3.06) for PD in first y; significantly higher risk (aHR, 2.34; 95% CI, 1.19-4.59) for PD in second y	No survival difference in patients with better case-mix profile and the highest propensity for initially receiving PD	Patients enrolled a median of 45 d after starting dialysis[a]
Liem et al[7] (2007)	16,643 RENINE patients (1987-2002)	Significantly lower mortality for PD (HR, 0.70; 95% CI, 0.67-0.74)	Relative survival advantage for PD decreases with time	Patients excluded if death occurred in first 90 d of dialysis[b]
Huang et al[8] (2008)	48,629 Taiwan Renal Registry patients (1995-2002)	No significant difference in survival; lower mortality ratio for PD patients aged <55 y and nondiabetic	—	Patients excluded if death occurred in first 90 d of dialysis[b]
Sanabria et al[9] (2008)	923 DOC Study patients (2001-2003)	Non–statistically significantly lower mortality rate for PD (aHR, 0.81; 95% CI, 0.64-1.02)	Lower mortality risk for young nondiabetic patients treated with PD	—
McDonald et al[10] (2009)	25,287 ANZDATA patients (1991-2005)	Significantly lower mortality rates during first y for PD (aHR, 0.89; 95% CI, 0.81-0.99)	PD associated with lower mortality during first 90 d; higher survival benefit of PD in patients aged <60 y without comorbid conditions	Patients excluded[c] if death occurred in first 90 d of dialysis[b]
Weinhandl et al[11] (2010)	12,674 CMS Medical Evidence Report patients[d] (2003)	Significantly lower mortality for PD (HR, 0.92; 95% CI, 0.86-1.00)	Similar adjusted 4-y survival	Propensity matching; patient outcomes analyzed from d 0 and secondary analysis of survival from d 90
Mehrotra et al[12] (2011)	684,426 USRDS patients (1996-2004)	Secular trend: progressive attenuation in the higher mortality risk for PD; in 2002-2004 cohort, no significant difference in mortality risk over 5 y for PD (aHR, 1.03; 95% CI, 0.99-1.06)	Relatively greater improvement of survival on PD over time	Patient excluded[c] if death occurred during the first 90 d of dialysis; largest sample size
Perl et al[13] (2011)	38,512 CORR patients (2001-2008)	Significantly higher 1-y mortality for HD patients who started with CVC (aHR, 1.8; 95% CI, 1.6-1.9); no significant difference in 1-y mortality between PD and HD patients who started with AVF or AVG (aHR, 0.9; 95% CI, 0.8-1.1)	Small survival benefit in HD patients with AVF or AVG after 1 y of dialysis	Multivariable piece-wise exponential nonproportional and proportional hazards models
Quinn et al[15] (2011)	6,573 Ontario patients (1998-2006)	No significant difference in survival between PD and HD patients (aHR, 0.96; 95% CI, 0.88-1.06)	Higher mortality rate for diabetic patients on PD	All participants received ≥4 mo of predialysis care and started dialysis electively as outpatients

(Continued)