COMMENTARY

A BRAZILIAN EXPERIENCE IN ASSISTED AUTOMATED PERITONEAL DIALYSIS: RELIABLE OPTION OR JUST A PALLIATIVE THERAPY?

In this issue of *Peritoneal Dialysis International*, the study by Franco *et al.* suggests that assisted peritoneal dialysis (PD) may emerge as an important modality option in developing countries. Assisted PD should play a prominent role in developing countries, because many use a “PD First” policy to maximize its use.

Often, countries with a high PD utilization have a low per capita income and are located in Central or South America. Those countries include El Salvador [77% PD use, per-capita gross domestic product (GDP) of US\$4 108], Mexico (66% PD use, per-capita GDP of US\$10 514), Guatemala (55% PD use, per-capita GDP of US\$3 330), and Colombia (37% PD use, per-capita GDP of US\$8 127 USD). Franco *et al.* studied assisted PD in Brazil (11% PD use, per-capita GDP of US\$12 465), which does not have particularly high PD use for a developing country, but nonetheless has a large PD population of more than 12 000 patients. Given limited health care budgets, countries such as these can treat more patients with kidney failure if the use of PD is maximized. Assisted PD can therefore increase the number of patients who can choose, remain, or switch to PD in developing countries.

A second factor increasing the utility of assisted PD in developing countries is changing population demographics. Traditionally, PD has been a self-care modality for patients in their fifties or early sixties, and the mean age of 54 in the Brazilian PD Registry falls within that range. However, Franco *et al.* report that 36% of the dialysis population in Brazil is now over the age of 65 years and that this segment is growing rapidly. The aging of the dialysis population places downward pressure on home dialysis use, because older age is consistently associated with lower home dialysis utilization. In contrast, assisted PD is a home-based modality that targets an older demographic. The mean age of the assisted PD population in Brazil was 72 years, which is quite similar to the mean age of 71–79 years reported in the developed world (1–3).

As more elderly patients start dialysis, assisted PD programs often naturally sprout up, because barriers to self-care PD become more prevalent. In our prospective study of incident dialysis patients in Canada (mean age: 66 years), at least one physical or cognitive barrier was present in 63% of patients (4). Physical barriers were decreased strength to lift PD bags (53%), decreased manual dexterity (43%), decreased vision (33%), decreased mobility (25%), decreased hearing (16%), and frailty (14%). Common cognitive barriers were language (15%), noncompliance (13%), dementia (8%), and psychiatric conditions (8%). Unless assisted PD is provided, full assisted (in-center) hemodialysis would be the default modality for many patients with barriers to self-care.

For the developing world, it is also important to understand who provides assistance, how those individuals are trained and supervised, how much assistance is provided, and who pays for it. Franco *et al.* describe a program in which nursing assistants were trained and funded by the dialysis program and not an external funding agency. In the developed world, registered nurses are typically the ones delivering most of the assisted care. Some authors argue that registered nurses are unnecessary because patients and families with no medical background can be taught to perform PD tasks. However, nurses can also provide ongoing education (which can facilitate more self-care over time), conduct clinical assessments, and detect problems early, thereby avoiding emergency room visits and hospitalizations. In Ontario, Canada, a mixed model is used in which nurses or registered practical nurses (probably similar to nurse assistants in Brazil) provide assisted PD depending on the complexity and needs of the patient.

The Franco *et al.* study was conducted in Rio de Janeiro, where each assistant supported up to 4 patients and travelled using public transportation. This design highlights an important factor for the success of assisted

PD programs: they generally thrive in densely populated areas with older populations. Geography permits the program to gain critical mass within its catchment area and to have one assistant visit multiple patients without spending inordinate amounts of time travelling.

The Brazilian assistants initially provided assistance with set-up of the PD cyclor, connection, and disconnection, but patients and families often learned to disconnect on their own, thus reducing the required visits. This practice is a common one. Although we tend to think of PD patients as either self-care or assisted, in reality they often undergo periods of assistance by family, nurses, or a combination.

One limitation of the Brazilian study is that the period or periods of assistance were not explicitly described. The periods of assistance and the visit rates during those periods are critical to know, because they determine the cost of assisted PD. If patients have periods without assistance or have days during the periods when no assistance is required (for example, the family provides assistance on weekends), then assisted PD becomes more cost-effective.

Previously, we showed that one major benefit of assistance is an increase in PD eligibility and choice (1,4). Franco *et al.* also describe using assisted PD to rescue patients who are no longer eligible for hemodialysis. That practice likely extended the lives of those patients, an important new benefit for assisted PD in selected cases. However, the impact of assisted PD on other important outcomes such as median patient survival in the PD population, peritonitis rates, and hospitalization is less clear.

Patients using assisted PD are typically elderly, have barriers to self-care, often lack family support, and may have failed hemodialysis. This population has a very high risk for adverse events. Indeed, Franco *et al.* reported an 18% risk of death at 1 year, which is within the range of 10%–24% found in other studies (1–3). Their technique failure at 1 year was only 3.4%, which is lower than the 12% risk reported from the French Registry (2), although the latter study also showed that assistance was associated with improved PD technique survival (2). The rate of peritonitis in the Brazilian study was 1 episode in 37 patient-months, an acceptable rate that is similar to rates reported in other studies. The 50% hospitalization rate reported by Franco *et al.* is congruent with other studies showing that this complication is common in assisted PD patients (5). Again, it is not clear whether these outcomes are caused by assisted PD or expected for this high-risk population.

Any discussion of assisted PD inevitably leads to the question of whether adding the associated costs

to PD are justified. The Brazilian assisted PD program cost \$560 per month for the nurse assistant, who could serve 4 patients, and \$150 per month for public transportation, adding \$177 to the \$1177 monthly base charge for automated PD—a 15% increase. Previously, we reported a mean rate of 4.6 nursing visits per week, which added approximately \$12 000 to the annual cost of PD in the Canadian health care system (1). However, comparing just the operational costs of assisted PD with those of hemodialysis is biased, because those costs often do not account for transportation or capital costs. For example, the National Health Service in the United Kingdom recently estimated the cost of transportation, largely driven by hemodialysis patients, to be £50 million annually, or approximately 10% of the cost of dialysis care (6). The capital costs of hemodialysis units are difficult to amortize, which is why they are often excluded. But in principle, the capital costs of assisted PD are borne by the patient (that is, their residence) and nursing services are delivered to their home. For in-center hemodialysis, the capital costs and the costs of transporting patients are both borne by the health care system.

In summary, assisted PD will likely emerge in developing countries, because their PD use is often very high, their populations are aging, and assisted PD will likely be cost-effective. Furthermore, assisted PD is a strategy that addresses well-described barriers to home dialysis in the end-stage renal disease population. It is also ethically sound because it expands choice and can extend life. Although fiscal realities in the developing world justify strict “PD First” policies, supporting patient choice is preferable. In rich developed countries, the situation is different. Funds are available to provide in-center hemodialysis, and so the implicit or explicit restriction of choice by implementing “PD First” policies or providing overly optimistic information about home dialysis is not ethical. Any “PD First” policy that limits patient autonomy and aggressively promotes home dialysis by providing unbalanced information fails to meet the standards of informed consent. As pressures on health care funding mount in developing and developed countries alike, assisted PD should facilitate, rather than restrict, patient choice.

DISCLOSURES

MJO is co-inventor of the Dialysis Measurement Analysis and Reporting (DMAR) system, which measures patient outcomes on peritoneal dialysis.

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REFERENCES

1. Oliver MJ, Quinn RR, Richardson EP, Kiss AJ, Lamping DL, Manns BJ. Home care assistance and the utilization of peritoneal dialysis. *Kidney Int* 2007; 71:673–8.
2. Lobbedez T, Verger C, Ryckelynck JP, Fabre E, Evans D. Is assisted peritoneal dialysis associated with technique survival when competing events are considered? *Clin J Am Soc Nephrol* 2012; 7:612–18.
3. Povlsen JV, Ivarsen P. Assisted peritoneal dialysis: also for the late referred elderly patient. *Perit Dial Int* 2008; 28:461–7.
4. Oliver MJ, Garg AX, Blake PG, Johnson JF, Verrelli M, Zacharias JM, et al. Impact of contraindications, barriers to self-care and support on incident peritoneal dialysis utilization. *Nephrol Dial Transplant* 2010; 25:2737–44.
5. Lobbedez T, Moldovan R, Lecame M, Hurault de Ligny B, El Haggan W, Ryckelynck JP. Assisted peritoneal dialysis. Experience in a French renal department. *Perit Dial Int* 2006; 26:671–6.
6. Kerr M. *Chronic Kidney Disease in England: The Human and Financial Cost*. Oxford, UK: Insight Health Economics; 2012.