ARE THREE EXCHANGES SUITABLE FOR ASIAN PATIENTS ON PERITONEAL DIALYSIS?

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Phenomenal growth in continuous ambulatory peritoneal dialysis (CAPD) has occurred in the developing countries of Asia. In many regions in Asia, neither governments nor insurance companies fully cover treatment expenses for dialysis. Hence, patients in developing countries such as India, Bangladesh, Pakistan, and Nepal use just three 2-L exchanges daily. Typical practice in many centers is to do daytime CAPD with a dry night. Most of our Indian patients who are on three exchanges per day showed a Kt/V of 1.67 and 2-year survival rate of 60% with a normalized protein equivalent of nitrogen appearance of 0.73–0.80 g/kg daily. Vegetarians had a lower protein consumption rate and lower serum albumin levels. Peritoneal membrane characteristics vary among high, high average, and low average in various regions of Asia. The prevalence of diabetic nephropathy, with its associated comorbid conditions, as a major cause of end-stage renal disease in the Indian subcontinent explains the differences in the CAPD mortality rates between India and various Asian countries. Given the financial constraints in countries in Asia, small-volume dialysis of 6 L daily may be an acceptable compromise in some patient populations with a smaller body size and significant residual renal function; however, dialysis dose should be individualized according to the needs of each patient.

Perit Dial Int 2003; 23(S2):S45–S47 www.PDIConnect.com

KEY WORDS: Adequacy; Asian patients.

Asia, the continent with the largest population, comprises both developed and developing countries. Among the developing nations, some are emerging from underdevelopment faster than others. Many nations in Asia lack consistent, reliable end-stage renal disease registries. In the last decade, peritoneal dialysis (PD) has experienced a significant expansion in large parts of Asia. In most countries, continuous ambulatory peritoneal dialysis (CAPD) is less expensive; but, in countries where fluids are imported, CAPD can be 2–3 times more expensive than hemodialysis.

Worldwide, medical and non medical factors play a role in the dose of dialytic treatment. In deciding the type and quantity of dialysis that a patient will receive, the availability of treatment modalities, the biases of the physician, and the social, cultural, geographic, and monetary factors all play a part (1,2). In Asia, the acceptance rate per million population of new patients for dialysis varies from less than 1 to 250 patients.

COST FACTORS

In many regions in Asia, neither the government nor insurance companies fully cover treatment expenses for dialysis. Hence, in making decisions about the feasibility of using three or four 2-L exchanges daily, the cost issue must be addressed (2–4). The conventional straight-line, single-bag system—once the predominant CAPD system in Asian countries—has been replaced by disconnect systems, with a resultant increase in the cost of PD. The monthly expenditure, including consumables and medications, varies from country to country in the Asian region. For example, the cost of a 2-L bag of dialysate varies between US$5 and US$20 (4). Because peritonitis and other complications related to PD remain an important barrier to long-term CAPD in the developing countries of Asia, the costs add up.

ADEQUACY

Peritoneal dialysis adequacy targets for an Asian population vary from those for a similar Caucasian population. Data from various regions in Asia show that dialysis adequacy, nutrition, residual renal function, and peritoneal membrane transport have a significant impact on the morbidity and mortality of PD patients (5,6). Most of the Chinese patients in Hong Kong who use three 2-L CAPD exchanges daily have
been shown to have survival equal to that of their Caucasian counterparts (5). The beneficial effect is seen even in anuric patients. In a recent South Indian observational study of 575 patients on CAPD, we found that 76% are using three 2-L exchanges; 17%, three exchanges of less than 2 L; and 7%, four 2-L exchanges. In our center, we observed 1- and 2-year patient survivals of 80% and 60% respectively. Certain available data (5) suggest that when dialysis adequacy (Kt/V) is greater than 1.9, a further increase in dose does not affect dietary protein intake. Contrasting data (7,8) show that an increase in the dialysis dose to four 2-L exchanges from three 2-L exchanges (with a corresponding increase in total Kt/V from 1.8 to 2.02) improves dietary protein intake as measured by normalized equivalent of protein nitrogen appearance (nPNA).

Any initiative to reduce mortality in dialysis patients must focus principally on cardiovascular disease. Cardiac failure and coronary artery disease are endemic in certain Asian countries, such as India. Lower mortality from those diseases may be achieved by careful attention to such clinical factors as adequate fluid removal, volume homeostasis, good blood-pressure control, good nutrition, normal acid-base balance, minimal anemia, and normal lipid and mineral metabolism.

The number of diabetic patients requiring renal replacement therapy has increased steeply on the Indian subcontinent, a circumstance which may have a major impact on patient outcome despite provision of adequate dialysis (9). Given the financial constraints in the developing countries in Asia, small-volume dialysis (6 L daily) may be an acceptable compromise in some populations with a smaller body size and significant residual renal function (5). Despite attempts to optimize the dialysis dose, studies have shown that achieving the minimum recommended targets is difficult in 70- to 80-kg patients with average transport status in Indian CAPD patients (13). Those varying distributions may provide a clue to the ethnic variation in the mortality of CAPD patients (14,15). Also, differences in patient compliance and in comorbidity factors such as age, diabetes mellitus, and coronary artery disease may at least partially explain the variations in the mortality rates of CAPD patients from different countries (15,16). In Asia, uniformly, the major cause of mortality in CAPD patients is cardiovascular death.

CONCLUSIONS

Data from Asia show that dialysis practices vary between countries, and that the variations are decided chiefly by reimbursement policies. Cost is the most significant factor in decision-making regarding the modality of renal replacement therapy. Developing countries in the region mostly use regimens of three 2-L exchanges daily. The long-term outcome of patients with loss of residual renal function requires a prospective study.

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