

Continuous ambulatory peritoneal dialysis in Toronto

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SUMMARY

During the period between September-77 and October-81, 409 patients were admitted for CAPD training to four teaching hospitals in Toronto.

By November 1981 45 % are still on CAPD. Of the remaining patients 69 (17 %) were transplanted, 55 (13,5 %) have died, and 93 (22 %) had been transferred to other modalities of dialysis.

The mean age of the patients who died was 58 years. Fifty-two per cent of these deaths were due to cardiovascular cause, thirty-one per cent were due to peritonitis.

Of the 93 patients who were transferred to other treatment 39 were so because recurrent peritonitis, 10 because membrane failure, 9 because patients' preference, 9 were unable to cope, 5 had technical failure, 7 back pain and 14 because other reasons.

The actuarial technique survival rate at 2nd and 4th years has been of 60 and 35 % respectively.

The actuarial patients survival rate has been of 80 % and 67 % at two and four years.

The actuarial technique survival rate among diabetics are of 95 % and 75 % at 1st and 2nd years at the Toronto Western Hospital.

Key words: CAPD, Actuarial Survival on CAPD, CAPD in Diabetics.

RESUMEN

En el período de tiempo comprendido entre septiembre de 1977 y octubre de 1981 409 pacientes fueron incluidos en programa de DPCA en el conjunto de 4 hospitales del área de Toronto. La edad media del grupo fue de 50,7 años.

En noviembre de 1981 el 45 % continúan en DPCA. Del resto: 69 (17 %) han sido trasplantados; 55 (13,5 %) han fallecido; 93 (22,7 %) han pasado a otras modalidades de diálisis, y 6 (1,4 %) han recuperado función renal o se ha perdido su control.

En el grupo de fallecidos la edad media era de 58 años. El 52 % murieron por causas cardiovasculares y un 31 % por peritonitis.

Hubo 93 pacientes que debieron ser transferidos a otras técnicas de diálisis por las siguientes razones: peritonitis recurrente, 39 (42 %); membrana dializante ineficaz, 10 (10 %); fracaso técnico, 5 (5,4 %); preferencia del paciente, 9 (9,7 %); incapacidad de realización de la técnica, 9 (9,7 %); dolor lumbar, 7 (7,5 %); otras causas, 14 (15 %).

Las modalidades de diálisis a las que estos pacientes fueron transferidos son: DPI hospital, 40; HD hospital, 39; DPI domicilio, 12; HD domicilio, 2.

La incidencia global de peritonitis ha sido de un episodio por cada 10,6 meses de tratamiento.

La supervivencia actuarial en la técnica es del 60 % al segundo año y del 35 % al cuarto año.

La supervivencia actuarial de pacientes es del 80 % y 67 % a 2 y 4 años.

El análisis separado de supervivencia en la técnica de diabéticos del Toronto Western Hospital arroja unas cifras del 95 % y 75 % al primero y segundo año.

Palabras clave: DPCA, supervivencia actuarial en DPCA, DPCA en diabéticos.

During the period between September 1977, when the first CAPD was done at the Toronto Western Hospital, and October 1981, 409 patients were admitted for CAPD training to four teaching hospitals in Toronto (Table I). The average age of these patients was 50.7 years, and there was a slight predominance of men. Of the new patients who entered CAPD during the first year, 15.7 % had diabetes and this fraction increased to 23 % in 1981.

An important advantage of CAPD is that it can serve persons in all age ranges including the very young and very old. This series will not include experience with CAPD in children but will describe only the 409 adult patients admitted to the adult hospitals.

OUTCOME

Table II shows the outcome in all these patients as of November 1981. Forty-five per cent are still on CAPD. A large percentage of these 409 patients have been transplanted and our experience indicates that almost any patient, who is a transplant candidate, can be maintained safely on CAPD while waiting for transplantation. Fifty-five patients (13.5 %) have died, 22 % had been transferred to other modalities, either hemodialysis or intermittent peritoneal dialysis and some recovered their kidney function. Figure 1 shows the actuarial patient, and the technique survival rates during this four-year period. As will be noted, a large percentage of the

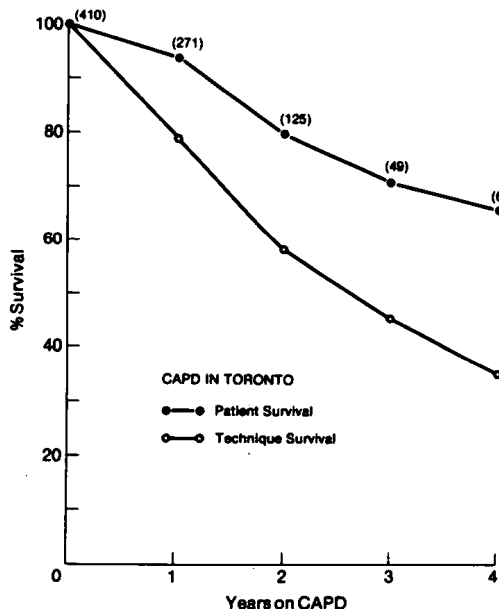


Fig. 1.—Actuarial patient and the technique survival rates of CAPD during four years in Toronto.

patients still fail on CAPD, but we hope this group will decrease in the future.

TABLE I
CAPD IN TORONTO, FOUR YEARS EXPERIENCE

Participating Institutions	
1.	Toronto Western Hospital.
2.	Toronto General Hospital.
3.	Sunnybrook Medical Center.
4.	The Wellesley Hospital.

TABLE II
CAPD OUTCOME
(September 1977 to November 30, 1981)

1.	Remain on CAPD	186 (45.5 %)
2.	Transplanted	69 (16.9 %)
3.	Died	55 (13.5 %)
4.	Transferred Dialysis	93 (22.7 %)
5.	Other *	6 (1.4 %)
		409

* Recovered renal function	2
Lost to follow-up	4

TABLE III
DEATHS ON CAPD

Total number	55 (13.5 %)
Mean age	58.6 years
Mean duration	14.9 months
Caused	
1. Cardiovascular	29 (52.7 %)
2. Peritonitis	17 (30.9 %)
3. Other	9 (16.4 %)

CAPD AND TRANSPLANTATION

Of the patients who entered the CAPD program, 69 (17 %) were transplanted. Their mean age was 38 years and the mean duration of CAPD before transplantation was 11.8 months. Those who were transplanted were younger and often «healthier» than those not transplanted.

DEATHS ON CAPD

Table III shows the number and causes of deaths among these 409 patients. Fifty-five (13.5 %) patients died during this period. Their mean age was 58 years and they had been on CAPD for an average of 14.9 months. Fifty-two per cent of these deaths were due to cardiovascular causes, something that one would expect in an older population. However many workers believe that hypertriglyceridemia and other lipid abnormalities present in these patients may contribute to this complication. Seventeen (31 %) of the total deaths

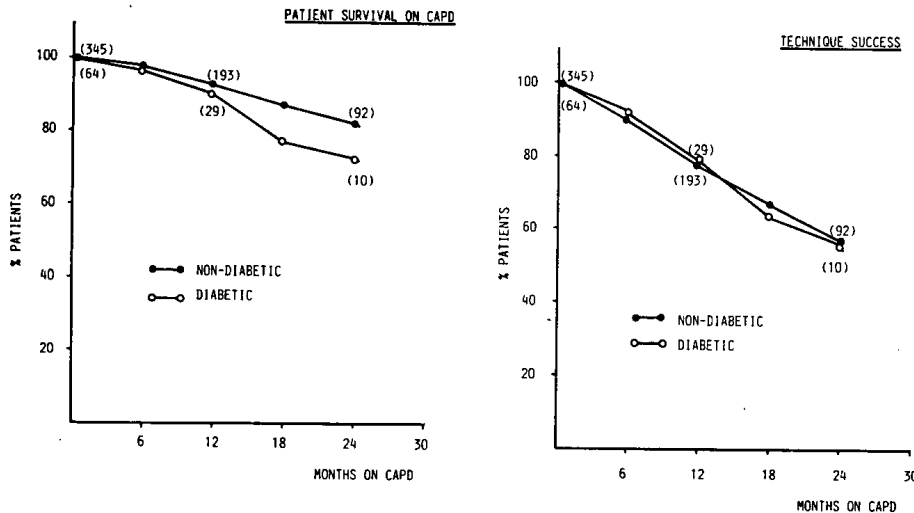


Fig. 2.—Actuarial patient and technique survival rate among the diabetic end-stage renal disease patients on CAPD in Toronto.

were due to peritonitis and the rest to other causes. Accordingly, the main causes of death in this population were cardiovascular events and peritonitis.

CAPD FAILURES AND TRANSFER TO OTHER FORMS OF DIALYSIS

Table IV shows those patients transferred to other treatments. Ninety-three (22.7 %) of the patients were transferred from CAPD to other modalities after they had been on CAPD for a mean duration of 7.8 months. Fifty-two of these 93 patients were transferred to intermittent peritoneal dialysis — an observation which indicates that the peritoneal membrane was still functioning.

The reasons for the transfer are shown in Table V. Thirty-nine patients were transferred because of recurrent peritonitis only 10 were transferred because of

membrane failure, — a figure which is a significantly lower than that reported by French nephrologists¹. Membrane failure is one of the most serious complications encountered during long-term peritoneal dialysis but fortunately this was not seen in most of our patients.

A few of the patients were transferred because of technical failure, nine because of preference, and nine because they were unable to cope. The latter were those who were living alone and for whom coming to the hospital was a major social event in their lives. Back pain, which originally was thought to be a common and a serious problem, forced an interruption in CAPD in only seven patients.

PERITONITIS

During this four year period and among these 409 individuals, 263 patients had 613 episodes of peritonitis — an overall incidence of one episode every 10.6 months. We believe that the present technique of CAPD has probably reached its maximum incidence of peritonitis, namely one episode every 12 patient-months.

Table VII shows the incidence of peritonitis for each year of this four-year period. In 1977, when we first started, we had one episode every 6.5 patient months, which further improved and it was the lowest in subsequent years reaching its peak in 1980 and 1981 episode every 10.6 months.

TABLE IV

TRANSFERS FROM CAPD

Total number	93	(22.7 %)
Mean duration	11.8 months	
Transfer to		
1. Center IPD	40	(43.0 %)
2. Center HEMO	39	(41.9 %)
3. Home IPD	12	(13.0 %)
4. Home HEMO	2	(2.1 %)

TABLE V

REASONS FOR TRANSFER

1. Peritonitis	39	(41.9 %)
2. Membrane failure	10	(10.8 %)
3. Technical failure	5	(5.4 %)
4. Patient preference	9	(9.7 %)
5. Unable to cope	9	(9.7 %)
6. Back pain	7	(7.5 %)
7. Other	14	(15.0 %)

TABLE VI

PERITONITIS

No. patients	263/409	(64.3 %)
No. episodes	613	(2.3/Pt.)
Patient months	6485	
Rate - 1 episode/10.6 Pt. Mo.		

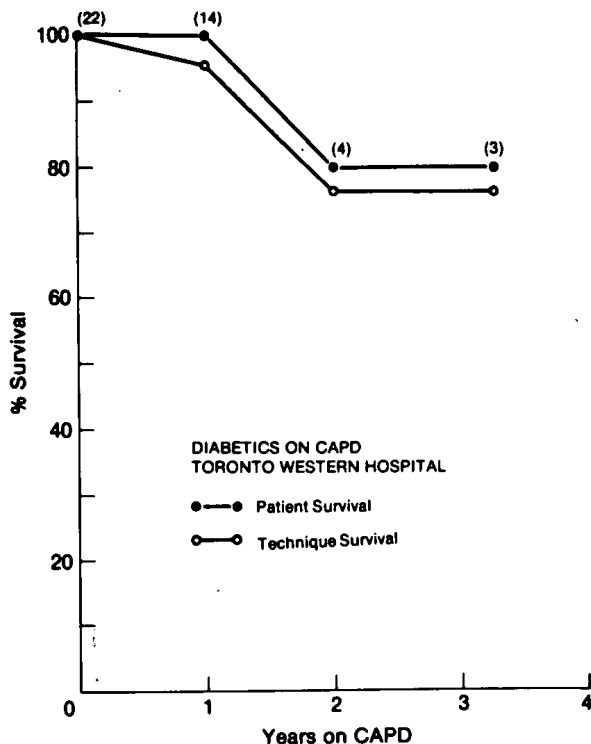


Fig. 3.—Actuarial patient and technique survival rate in diabetics on CAPD at the Toronto Western Hospital.

Table VII shows the incidence of peritonitis at the Toronto Western Hospital; this is better than the overall record indicating that, with experience, a center can improve its performance.

PATIENT SURVIVAL AND TECHNIQUE SUCCESS RATES

When these results (Fig. 1) are being analyzed, one should keep in mind the process of negative selection which operates among patients on CAPD, for example the successful ones are removed for transplantation. It is unfortunate that the literature contains no good data on patient survival on hemodialysis. The estimate of an annual mortality of 10 to 15% among patients on chronic hemodialysis, which has been reported in many publications, probably represents a reasonable estimate in hemodialysis.

DIALYSIS TRENDS IN TORONTO (Table VIII)

Before CAPD came onto the scene, there was a great emphasis on home dialysis in Toronto. Since the intro-

TABLE VII PERITONITIS RATE PER PATIENT MONTHS

	Toronto	TWH
1977	6.5	9.5
1978	7.7	8.7
1979	9.5	12.3
1980	12.4	23.7
1981	11.8	17.4
MEAN	10.6	14.3

TABLE VIII DISTRIBUTION OF PATIENTS ENTERING THE HOME TRAINING PROGRAM IN TORONTO

Home	1976 (%)	1977 (%)	1978 (%)	1979 (%)
Hemo	80 (48)	82 (46)	43 (21)	29 (13)
PD	86 (52)	87 (50)	18 (9)	13 (6)
CAPD	0	7 (4)	144 (70)	180 (61)

duction of CAPD, home hemodialysis has decreased steadily as CAPD has increased. Similarly in the United States, more than one-half of the patients who are now on home dialysis are maintained on CAPD; which indicates that this technique is particularly suitable for home dialysis.

CAPD IN DIABETICS

Figure 2 shows the actuarial patient and technique survival rate among the diabetics in Toronto; figure 3 shows similar results for the 22 patients who entered the Toronto Western Hospital program. These results are much better than those previously reported for intermittent peritoneal dialysis and compare favorably with those reported from the best hemodialysis and transplantation groups^{2,3}, in diabetics with end-stage renal disease.

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