

RISK FACTORS FOR PERITONITIS AND TECHNIQUE FAILURE IN CAPD: INCREASED AGE AND DIALYSATE IgG PROTECT AGAINST PERITONITIS

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Summary

Life-tables have been calculated for all patients (n=135) treated with CAPD since the start of our programme in September 1980. Patients who were aged greater than 60 years at the start of treatment had a significantly lower incidence of peritonitis. There was a positive correlation between age and dialysate IgG ($p < 0.01$) which may provide an explanation for this finding. The life-curves for time to first episode of peritonitis and to all episodes of peritonitis are very similar; this suggests that the occurrence of an episode of peritonitis does not increase the likelihood of subsequent episodes.

Methods

A programme to calculate life-tables by the method of Peto and Pike [1] has been written for an Apple IIe microcomputer. The data and calculations are printed out in full and can be confirmed to be accurate. Statistical comparison between groups is performed using the Log-rank test and the result presented as a χ^2 value.

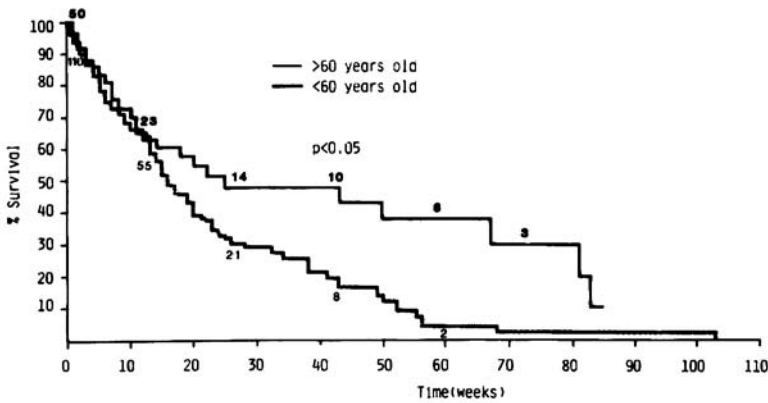
All patients (n=135) receiving treatment with CAPD were entered into the analysis. The mean age of the patient population is 48.5 years (± 15.6 SD). Forty-three patients were over the age of 60 years (63.6 ± 2.89 years). All common causes of end-stage renal failure were represented with only a small proportion of diabetic patients (4.4% of the total). The end points studied were death from any cause; technique failure resulting in a change to a different dialysis modality or death (transplantation was treated as a loss to follow-up); first episode of peritonitis (defined as a dialysate leucocyte count in excess of $100/\text{mm}^3$) and all episodes of peritonitis (patients being re-entered into the analysis 14 days after the completion of treatment for a previous episode). The following risk factors were analysed: sex, age greater than 60 years at the start of treatment, year of entry to the CAPD programme, and whether CAPD was used as a primary treatment or following the failure of another treatment modality.

IgG concentration in peritoneal dialysis effluent after a 12-hour overnight dwell period was measured by radial immunodiffusion.

Results

None of the risk factors examined had a significant influence on technique failure. There was a significantly lower incidence of peritonitis in patients over the age of 60 years at the start of treatment ($p < 0.05$). The technique failure rate in these two groups was very similar (Figure 1). The cohort of patients who started CAPD in 1983 had a significantly higher incidence of peritonitis ($p < 0.05$) having a 50 per cent probability of developing peritonitis in twelve weeks, yet technique failure was rather lower in this group ($p < 0.1$). These data suggest that the occurrence of peritonitis does not have a major influence on technique failure.

Actuarial Survival Curve For Time To First Episode Of Peritonitis In All Patients Taken Onto Guy's Hospital CAPD Programme September 1980 - October 1984



Actuarial Technique Survival For Patients Taken Onto The Guy's Hospital CAPD Programme September 1980 - October 1984 (Transplantation=Lost To Follow Up)

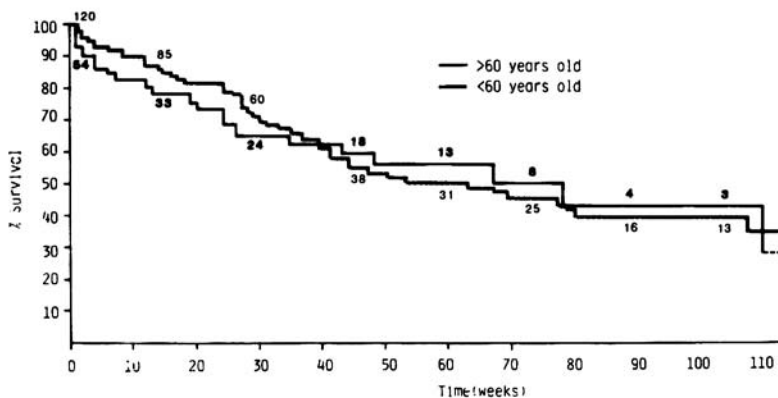


Figure 1

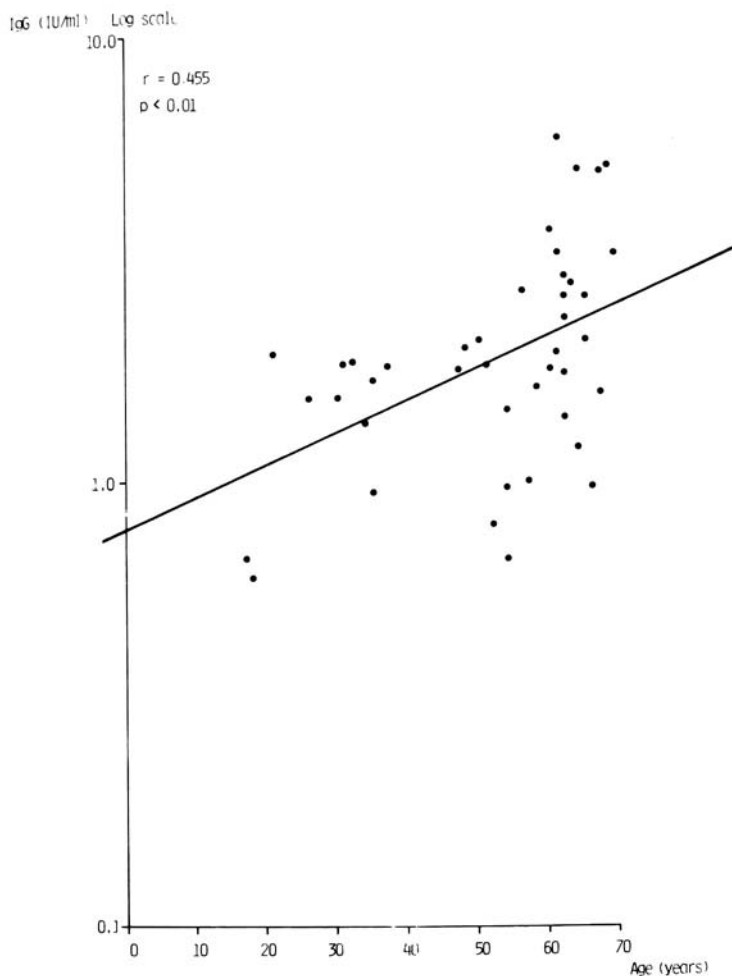


Figure 2. Concentration of IgG (IU/ml-log scale) in peritoneal effluent after a 12 hour dwell period against age of patient

The concentration of IgG showed a positive correlation with increasing age at start of treatment ($r=0.455$, $p<0.01$) (Figure 2). There was a ten-fold difference between the lowest and the highest level of dialysate IgG with a three-fold difference in the line of best fit between the ages of 17 and 70 years.

The life curves for time to first episode of peritonitis and all episodes of peritonitis are very similar (Figure 3).

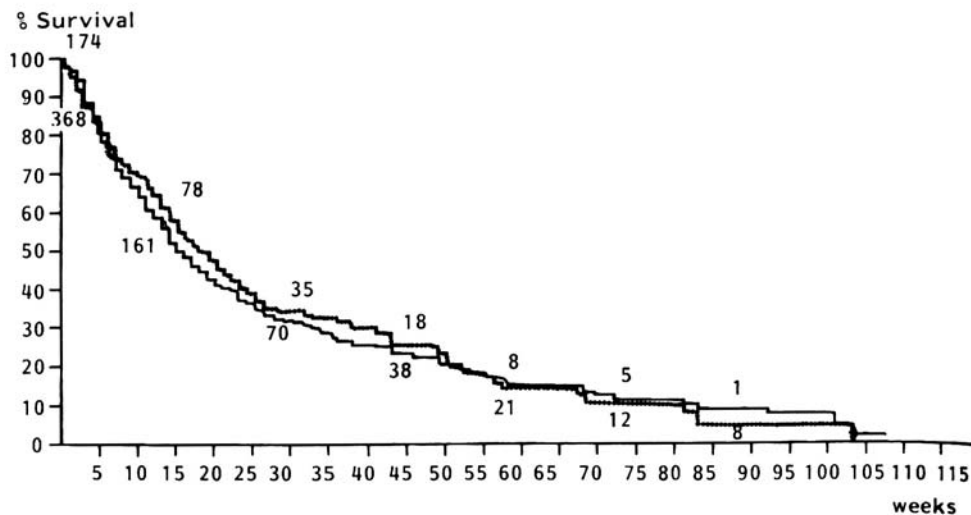


Figure 3. Actuarial surviving curve for time to first episode of peritonitis (.....) and time to all episodes of peritonitis (—)

Discussion

These results clearly demonstrate a lower incidence of peritonitis in older patients on CAPD. Despite a wide scatter of results we have observed a significantly higher level of IgG in older patients. We have previously shown that this results in more effective opsonisation of *Staphylococcus epidermidis* [2], and it may protect against peritonitis [3].

The marked similarity between the life-tables for time to first episode of peritonitis and time to all episodes of peritonitis suggests that the occurrence of one episode of peritonitis does not predispose to further attacks. In view of this we propose to conduct prospective trials into measures to reduce the incidence of peritonitis on a cross-over basis. There will be random allocation to one of two treatment regimes, and cross-over to the alternative regime would occur either after an episode of peritonitis, assuming successful treatment, or after a pre-determined time interval (e.g. one year) if peritonitis had not previously occurred.

References

- 1 Peto R, Pike MC, Armitage P et al. *Br J Cancer* 1976; 34: 585
- 2 Yewdall VMA, Bennett-Jones DN, Cameron JS et al. *Proc III Int Symposium on CAPD, Washington*. 1984: in press
- 3 Keane WF, Comty CM, Verburgh HA, Peterson PK. *Kidney Int* 1984; 25: 539