

Evaluation of two hour short peritoneal equilibration test effectiveness in peritoneal dialysis

Yasemin Bakar, Adana Science and Technology University, Adana, Turkey

Filiz Gul, Cukurova University School of Medicine

Ummuhan Bukan, Cukurova University School of Medicine

Elif Sahan, Adana Numune Gov. Hospital

Hediye Oner, Adana Numune Gov. Hospital

Gulsen Kaygusuz, RTS Seyhan

Filiz Karasu, Mersin Gov. Hospital

Zehra Aydın, Beykoz University

Introduction

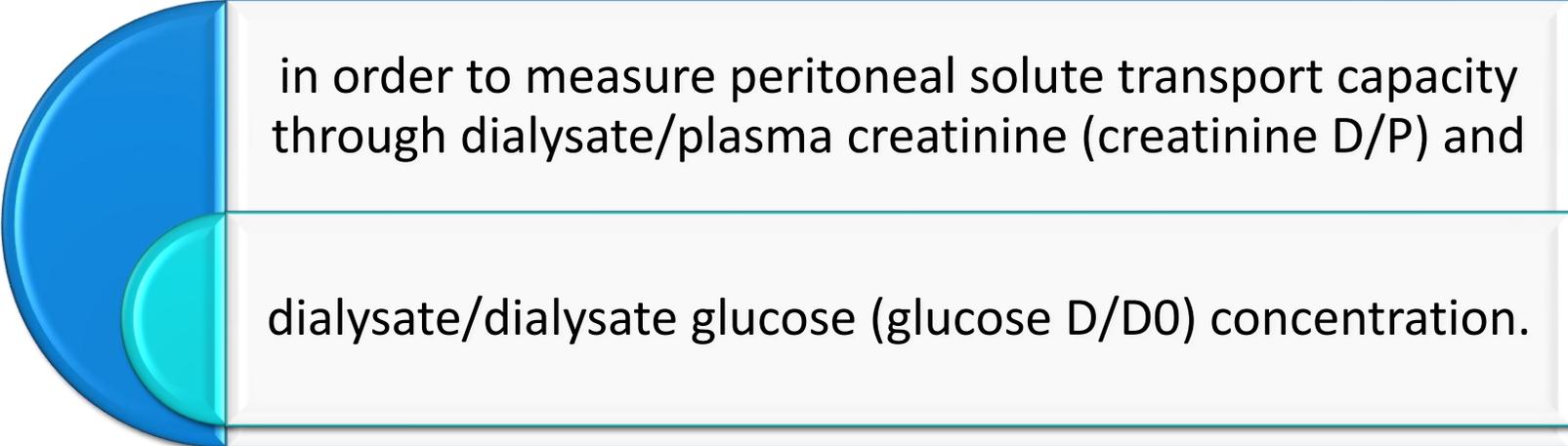
Determining an appropriate prescription for patients on peritoneal dialysis (PD) requires an exact evaluation of the peritoneal membrane transport characteristics.

The peritoneal equilibration test (PET) has been used as the “gold standard” to define peritoneal membrane permeability and to prescribe peritoneal dialysis therapy on an individual basis.

Twardowski introduced this test in clinical practice more than 30 years ago.

Introduction

The original method is performed using a single peritoneal dwell 4-h long and a solution with a glucose concentration of 2.27% (2.27%-PET).



in order to measure peritoneal solute transport capacity through dialysate/plasma creatinine (creatinine D/P) and

dialysate/dialysate glucose (glucose D/D0) concentration.

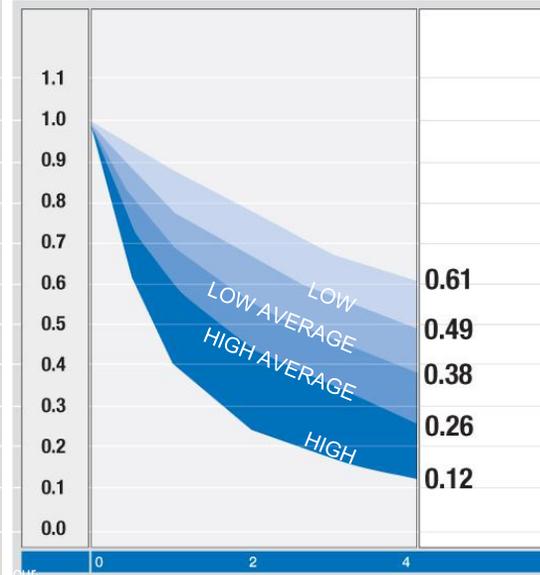
Introduction

Four different membrane types are identified based upon the 4-hr equilibration between dialysate (D) and plasma (P) creatinine and glucose, as shown below.

D/P Creatinine



D/D₀ Glucose



Membrane Transport Type	4-Hour D/P Creatinine
HIGH	.82 - 1.03
HIGH AVERAGE	.65 - .81
LOW AVERAGE	.50 - .64
LOW	.34 - .49

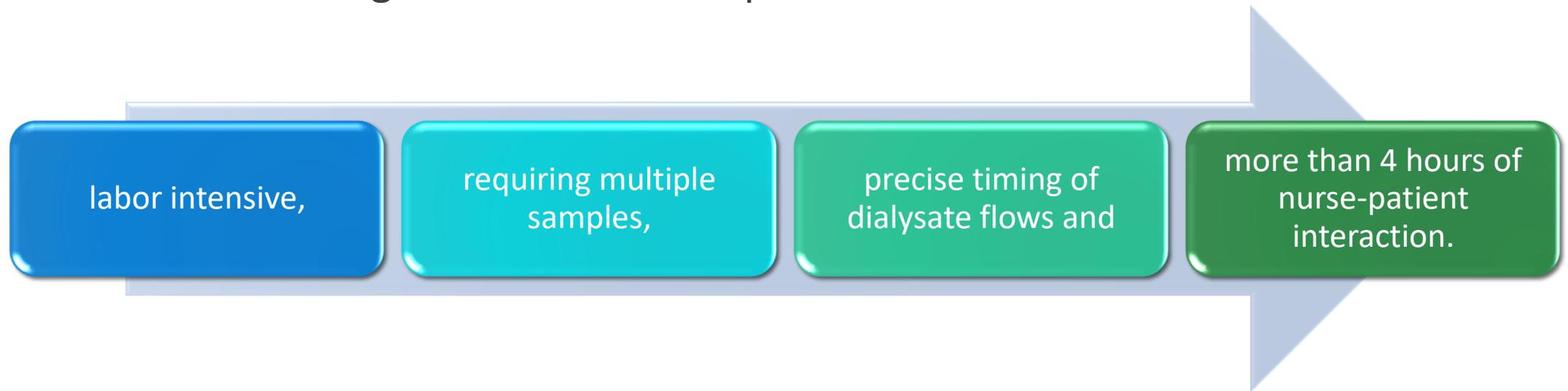
The transport types of "low" to "high" are also referred to as "slow" to "fast" by some clinicians.

Introduction

The PET is the most widely used testing method

The protocol is designed to provide for a maximal level of accuracy and reproducibility.

However it is recognized that the PET protocol is



Introduction

As a result, the PET protocol is, in many dialysis centers, performed infrequently or not at all.

Another approach is to use a test that is less precise but is very easy to perform .

The availability of such a test might result in more widespread use of peritoneal transport testing with clinicians becoming more adept in the technique.

Aim

In this study, we aimed to analyze the efficacy of the 2 hr Short PET and compare its results with the standard PET in our patient population.

Method

A prospective observational protocol was applied in four dialysis centers between January –July 2017,

84 patients who are above 18 years old, who are on PD therapy for at least 3 month, remained stable for the last two months were enrolled to the study.

The patients who have an episode of peritonitis within the last 3 months, patient who have hypervolemia, patients with catheter related problem and patient who have deep anemia (Hb < 8 gr/dl) were excluded from the study.

The patients were informed, and their consent was obtained

Local ethics committee approved the study before the protocol was started.

Method

For the standardization of the research protocol and the PET procedure were reviewed with the PD nurses in the centers, where the study was conducted.

For the purpose of this study the patients were invited to the PD unit

Method

Routine standard PET application was performed.

2.27% glucose-containing peritoneal dialysis solution were used for 4-hour PET .

After 8 hours nighttime dwell, effluent was drained out in the Peritoneal Dialysis Unit.

2 Lt of 2.27% glucose dialysis solution was infused into the peritoneal cavity within 10 minutes.

10 ml of dialysate samples were drawn at times 0, 2nd, and 4th hours. Glucose, urea and creatinine values of the dialysate were analyzed at each time point.

A blood sample was drawn at the 2nd hour to determine the glucose, urea and creatinine values.

After the 4th hour sample, effluent was drained completely for at least 20 minutes and volume was measured.

Method

Standard deviation was added to or subtracted from mean D/Pcrea ratios at hours 2, and 4 to determine transport groups.

The patients with a D/Pcrea ratio +1 SD higher than the mean value were considered high; Patients with a ratio between +1 SD and mean value were considered high average;

Patients with a ratio between mean value and 1 SD were considered low-average; and patients with a ratio -1 SD lower than the mean value were considered low-permeable

2nd and 4th hours D / P creatinine was calculated and the difference between the two results was compared.

Transport groups	2 hour D/Pcrea	4 hour D/Pcrea	
Low	<0.44	<0.56	> +1 (mean value)
Low Average	0.44-0.54	0.56-0.69	+1 (mean value)
High Average	0.55-0.65	0.70-0.82	-1 (mean value)
High	>0.65	>0.82	< -1 (mean value)

Results

The mean age of the patients was 51.61 ± 13.7 (range: 23-77) years

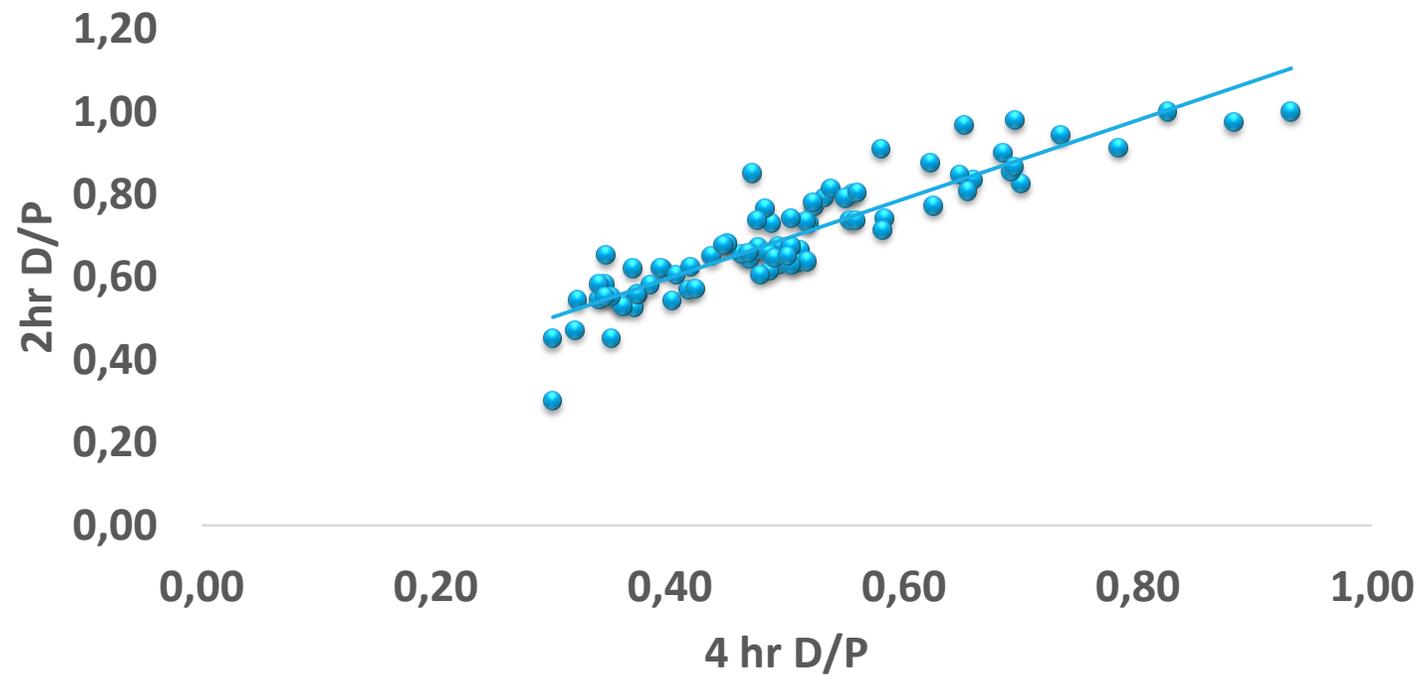
The patients were on PD treatment for a mean of 26.9 ± 15.9 (range: 4-63) months.

According to the standard PET, low transport in 26 patients, low-average transport in 34 patients, high-average transport in 10 patients and high transport types in 14 patients were identified

83 % of the patients at 2 hours fell into the same transport group at 4 hours.

Results

There was a strong correlation between 4-hour D/P crea ratio and 2-hour (r=0.867,p<0.001) D/P crea ratios



Conclusion

Two-hour short PET seems that is;



Two-hour short PET gives promising results that have to be confirmed in the future in studies comprising a larger number of patients.