

IMPACT OF INITIAL DIALYSIS MODALITY AND MODALITY SWITCHES ON PATIENT SURVIVAL: A COHORT STUDY

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INTRODUCTION

Survival of dialysis patients depends on many factors. We investigated how the initial dialysis modality and modality switches influence patients' survival.

METHODS

We performed an analysis of the Moscow City Nephrology Registry with inclusion of 11,021 incident hemodialysis (HD) and peritoneal dialysis (PD) patients started treatment from 1/1/1995 to 31/12/2012. We identified 4 groups according to initial modality and long-term transfer (duration>30 days) to another modality: **HD only**, **PD only**, **initial HD with permanent switch to PD (HD->PD)**, **initial PD with permanent switch to HD (PD->HD)**. Survival was calculated by Kaplan-Meier method with intent-to-treat approach (censoring at end study period, kidney transplantation, or lost of follow-up). P values were adjusted by Benjamini-Hochberg-Yekutieli procedure for controlling false discovery rate in multiply comparisons.

RESULTS

Demographic data and duration of pre-dialysis nephrology care are presented in table 1, and results of survival analysis - in tables 2,3 and figure.

Table 1. Demographics and duration of predialysis nephrology care

	HD	PD	HD->PD	PD->HD
Age, years	51.1 ± 16.2	48.7 ± 17.3	52.0 ± 15.8	49.6 ± 14.7
Sex, % of males	57.1	51.5	48.5	47.6
Diabetes mellitus, % of patients	16.5	19.5	17.7	17.9
Duration of pre-dialysis nephrology care				
≥ 1 year	20.0	29.0	26.5	32.9
3 months – 1 year	9.1	12.4	9.2	10.1
≤ 3 months	70.9	58.6	64.3	57.0

HD – hemodialysis only, PD – peritoneal dialysis only, HD->PD – initial HD with permanent switch to PD, PD->HD – initial HD with permanent switch to PD

We found the highest survival during all 5 years of follow-up in patients switched from PD to HD ($P<0.00005$) in comparison to all other groups (table 2 and 3, figure). Survival in PD only was higher than in HD only group in the first year of treatment, there were no statistically significant differences from 2 to 4 years, and 5 year survival was significantly lower in PD only patients. Possibility to switch modality from PD to HD was beneficial at the 5 years of follow-up ($P<0.00005$ in comparison to PD only), while switching from HD to PD gives advantage only during first 2 years of treatment ($P<0.00005$ in comparison to HD only).

CONCLUSIONS

The highest survival was found in patients switched from PD to HD in all time points among 4 groups. Possibility to switch from HD to PD provided benefits only in the first two years of dialysis treatment. PD only patients had better survival over HD only patients at the first year of dialysis, but worse survival at the fifth year of follow-up. Our results suggest that PD was the preferable initial dialysis modality that could be later switched to HD.

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Table 2. Patient survival according initial dialysis modality and modality switch

Group	Survival, % (95% CI)				
	1-year	2-years	3-years	4-years	5-years
HD only (n=8718)	76.1 (75.1-77.0)	69.4 (68.3-70.5)	64.1 (62.9-65.3)	58.6 (57.4-60.0)	54.5 (53.2-55.9)
HD->PD (n=661)	87.7 (85.1-90.3)	75.9 (72.4-79.5)	63.0 (58.9-67.4)	49.3 (44.8-54.2)	42.0 (37.4-47.2)
PD only (n=1223)	82.0 (79.7-84.4)	68.4 (65.5-71.6)	56.7 (53.3-60.3)	45.0 (41.3-49)	33.7 (29.9-37.9)
PD->HD (n=419)	96.0 (94.2-98)	89.7 (86.7-92.8)	82.0 (78.1-86.0)	74.6 (70.2-79.3)	67.5 (62.6-72.7)

95% CI – 95% confidence interval

HD – hemodialysis only, PD – peritoneal dialysis only, HD->PD – initial HD with permanent switch to PD, PD->HD – initial HD with permanent switch to PD

Table 3. Statistical significance of differences in survival rates between groups

Comparison groups	Statistical significance (P)				
	1-year	2-years	3-years	4-years	5-years
HD vs PD	<0.00005	NS	NS	NS	<0.001
HD vs HD->PD	<0.00005	<0.00005	0.06	NS	NS
HD vs PD->HD	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
PD vs PD->HD	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
PD vs HD->PD	<0.005	<0.0001	<0.01	<0.05	<0.05
HD->PD vs PD->HD	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005

HD – hemodialysis only, PD – peritoneal dialysis only, HD->PD – initial HD with permanent switch to PD, PD->HD – initial HD with permanent switch to PD

Figure. Patient survival according initial dialysis modality and modality switch

