RISK FACTORS FOR ARTERIOVENOUS THROMBOSIS IN HEMODIALYSIS PATIENTS

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Introduction and aim

- Functional vascular access remains the most important issue in hemodialysis (HD) patients. Prevention of vascular access complications and maintaining arteriovenous fistula (AVF) patency for long-term use has high priority in dialysis therapy.
- The aim of the study was to determine the risk factors for arteriovenous fistula AVF thrombosis in HD patients.

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Material and method

- In this multicenter retrospective study data from annual vascular access reports of prevalent and incident 397 hemodialysis patients (247M and 150 F) were collected over a period of one year.
- The clinical parameters folowed were hemodialysis time per week (hours), high ultrafiltration rate (UF>3% body weight), intradialysis hypotension frequency, comorbidities (diabetes mellitus-DM and heart failure-HF), AVF localisation (distal or proximal), time before the first AVF cannulation (weeks), AVF time patency (months), blood flow, venous pressure, cannulation technique, AVF recirculation (>=10%) and HD adequacy parameter (eKt/V). The group of patients with AVF thrombosis was compared with other patients without AVF thrombosis.
- Statistical analysis was performed by SPSS, the results are presented with descriptive statistics (the average value and percentage) and analysis of variance and chi square tests were performed for comparisons of means and frequencies, and Cox regression analysis for predictors of AVF survival.

Results

Table 1. Clinical parameters in patients regarding AVF thrombosis

	Without AVF thrombosis n=358	AVF thrombosis n=39	Sig.
Age (years)	61,68 ± 12,25	62,38 ± 10,4	n.s.
AVF time patency (months)	57 ± 56,7	33,1 ± 48,2	p=0.012
Blood flow (ml/min)	297,5 ± 42,5	278,7 ± 41,8	p=0.009
Recirculation (%)	4,9 ± 5,2	9,8 ± 11,3	p<0.001

Graph 3. The frequency of AVF thrombosis regarding venous pressure



Hypotension No hypotension 25 % 21.9 20 15 7.5

21,9% vs 7,5%; p<0,001

Graph 4. The frequency of AVF thrombosis regarding cannulation technique



Graph 2. The frequency of AVF thrombosis regarding blood flow



Graph 5. AVF survival regarding blood flow



Table 2. Risk factors for AVF thrombosis

	HR	Significance
Blood flow ≤ 200 ml/min	21,065	p<0.001
Blood flow 201-300 ml/min	2,93	p=0.005
AVF recirculation ≥ 10%	4,513	p<0.001
Intradialysis hypotension	3,367	p<0.001
Anterograde bevel down cannulation	2,43	p=0.012

Cox regression analysis: Chi square=59,7; p<0.001

Graph 1. The frequency of AVF thrombosis regarding HD hypotension

Conclusion

Avoidance of intradialysis hypotension, timely correction of AVF recirculation and malfunction, and improvement of cannulation practice guidelines are the most important factors for prevention of AVF thrombosis and long-term AVF patency.