

VASCULAR ACCESS AND RISK FACTORS FOR HOSPITALIZATION IN HEMODIALYSIS PATIENTS

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INTRODUCTION AND OBJECTIVES

Complications pertaining to vascular access are one of the main reasons for hospitalization in hemodialysis (HD) patients. The aim of the study was to determine the risk factors for vascular access-related hospitalization in HD patients.

METHODS

The multicenter retrospective study encompassed 474 HD patients (190 F and 284 M) with the mean age $59,89 \pm 12,83$ years, and the mean HD vintage $71,94 \pm 68,9$ months. The clinical characteristics and frequency of certain complications pertaining to vascular access in all examined patients was followed over the last year. According to actual vascular access present, arteriovenous fistula (AVF) or central venous catheter (CVC), all examined patients were divided into two groups. Vascular access related-hospitalization rate and all cause mortality was expressed per 100 patient-years. For statistical analysis chi-squared test, analysis of variance and logistic regression analysis were performed by software SPSS version 11,5.

RESULTS

Figure 1. Baseline clinical characteristics among hemodialysis patients

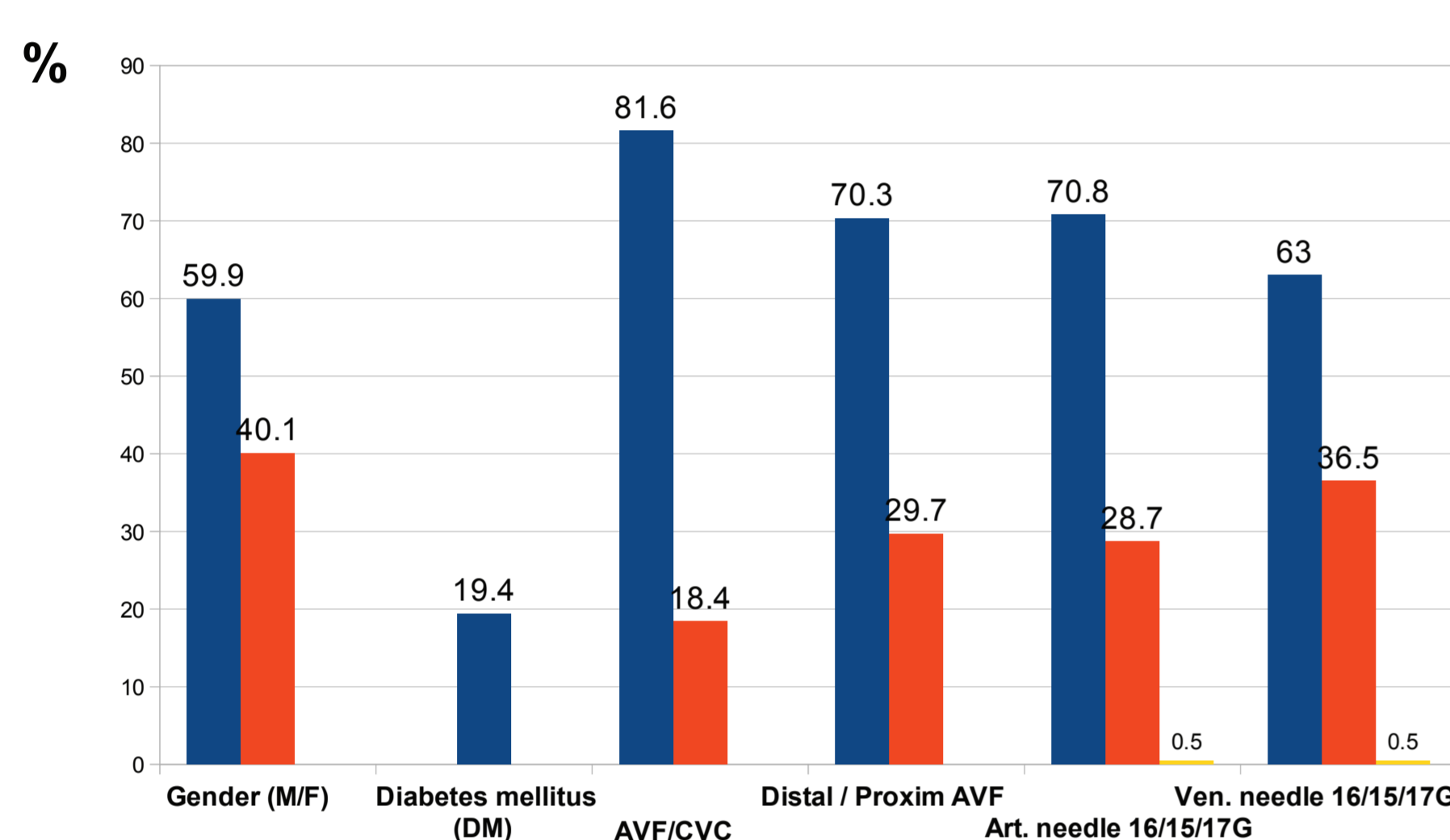


Figure 2. Prevalence of vascular access related complications among hemodialysis patients

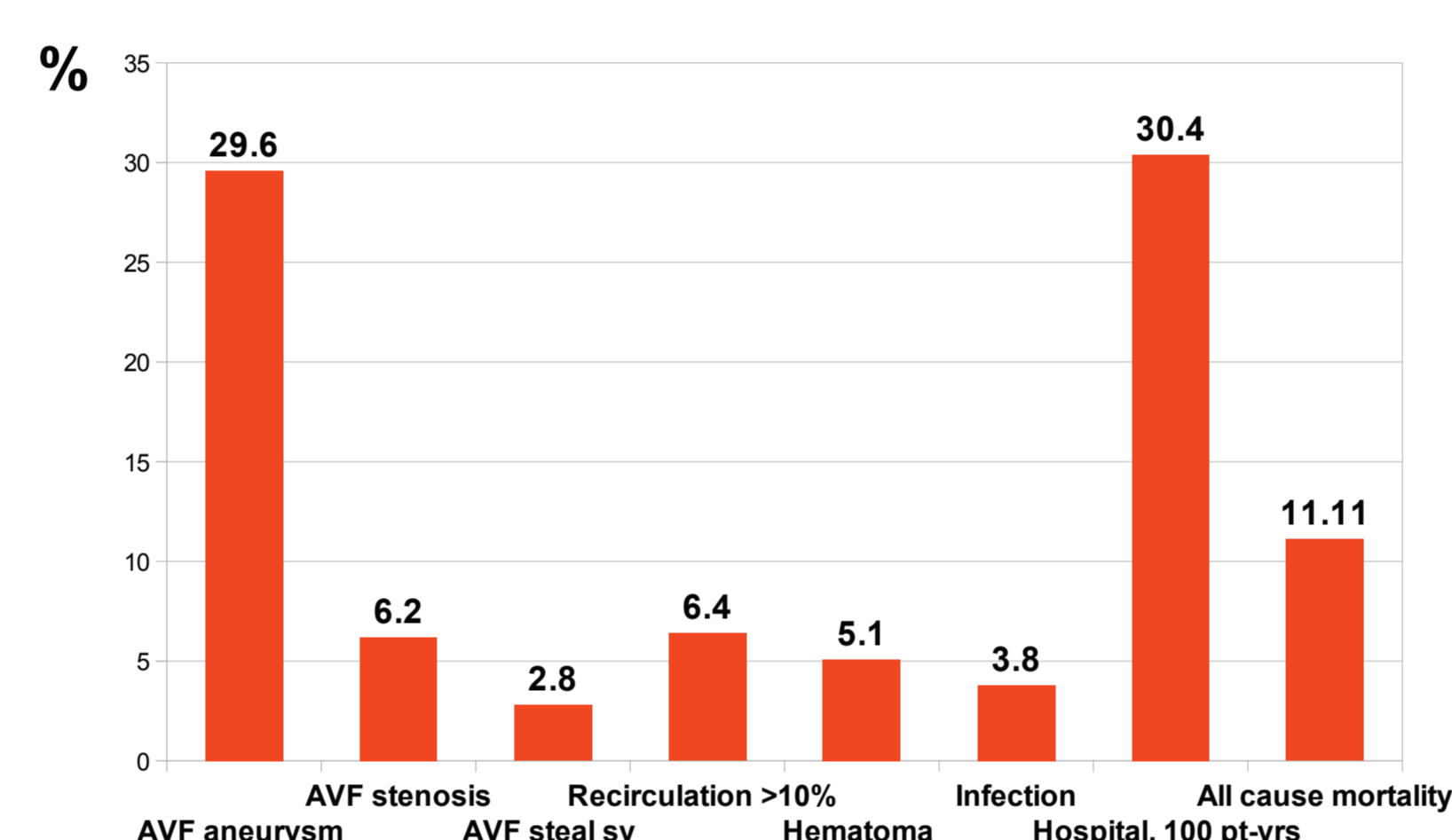


Figure 3. Distribution of clinical parameters among hemodialysis patients according to vascular access type

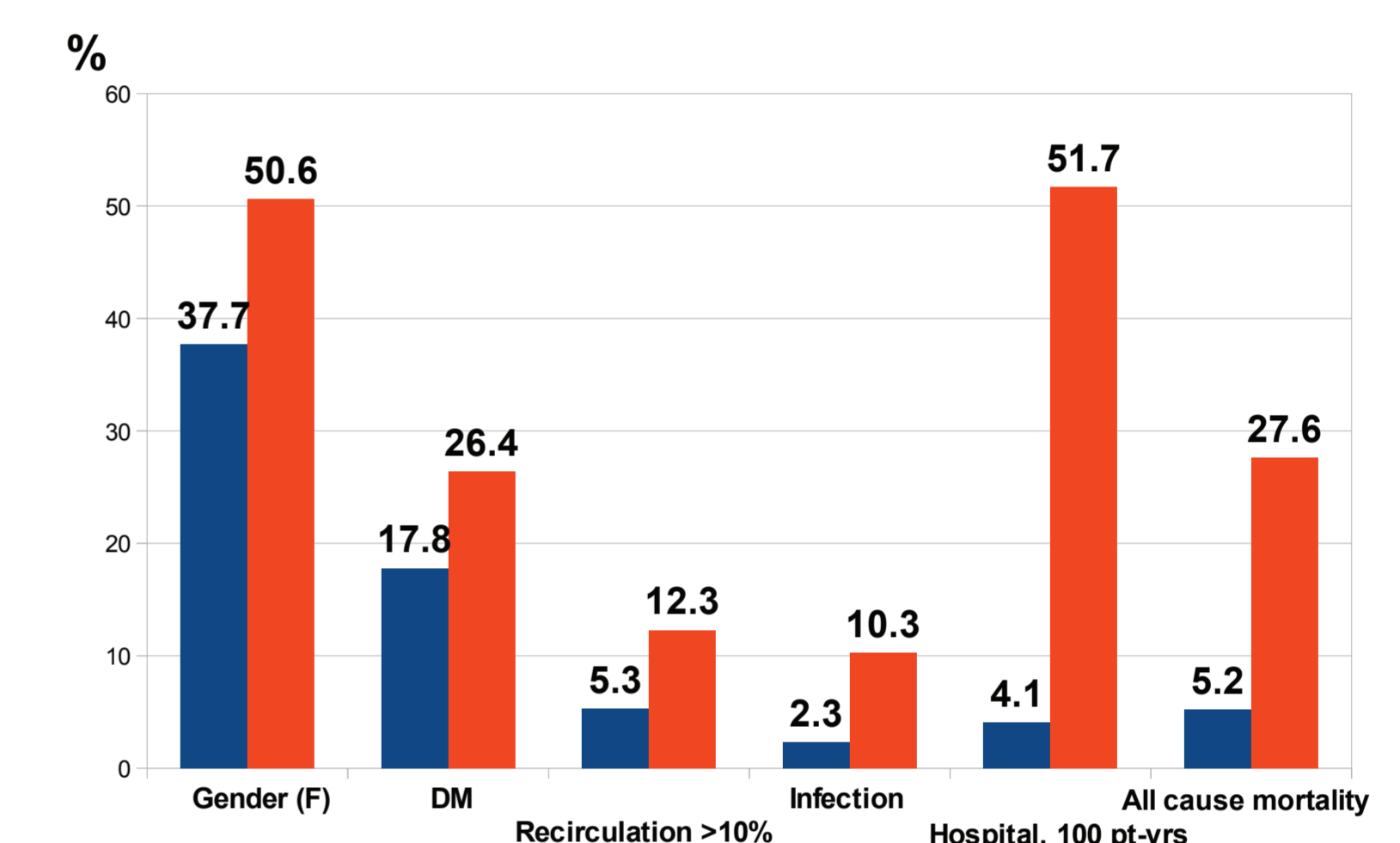


Table 1. Mean values of clinical parameters among hemodialysis patients according to vascular access type

	AVF	CVC	Significance (ANOVA)
Number of patients N=474	387 81,6 %	87 18,4 %	
Age (years)	59,62 ± 13,09	61,62 ± 11,46	n.s.
HD vintage (months)	76,02 ± 69,58	50,67 ± 61,65	p= 0.004
Vascular access vintage (months)	63,76 ± 59,52	17,43 ± 29,4	p< 0.001
Blood flow (ml/min)	297,38 ± 29,79	277,85 ± 30,81	p< 0.001
eKTV	1,35 ± 0,18	1,19 ± 0,23	p< 0.05
Arterial pressure (mmHg)	-141,38 ± 38,45	-157,79 ± 44,55	p= 0.001
Venous pressure (mmHg)	112,16 ± 33,33	109,07 ± 33,54	n.s.

Table 2. Adjusted relative risk for vascular access related hospitalization among hemodialysis patients

	B	S.E.	Wald	df	Sig.	Exp (B) Odds ratio	95% CI for Exp (B)
AVF/CVC	2,856	0,481	34,575	1	0,000	17,914	8,547 - 46,273
Blood flow	- 0,013	0,007	3,183	1	0,074	0,987	0,973 - 1,001
AVF aneurysm	- 1,500	0,826	3,296	1	0,069	0,223	0,044 - 1,127
AVF stenosis	2,935	0,833	12,421	1	0,000	18,815	3,679 - 96,226
AVF steal sy	- 19,269	10199,79	0,000	1	0,998	0,000	0,000 -
Gender (F/M)	1,159	0,504	5,282	1	0,022	3,186	1,186 - 8,557
Age	0,001	0,017	0,005	1	0,944	1,001	0,969 - 1,035
HD vintage	0,001	0,003	0,039	1	0,844	1,001	0,994 - 1,007
DM	- 0,29	0,557	0,271	1	0,603	0,748	0,251 - 2,231
Infection	2,034	0,847	5,759	1	0,016	7,641	1,452 - 40,221
Hematoma	0,269	0,985	0,074	1	0,785	1,308	0,19 - 9,018

Logistic regression analysis: Chi squared=84,778, d.f. 11; Sig. p<0.001

Table 3. Adjusted relative risk for all cause mortality among hemodialysis patients

	B	S.E.	Wald	df	Sig.	Exp (B) Odds ratio	95% CI for Exp (B)
AVF/CVC	2,546	1,024	6,187	1	0,012	12,787	1,718 - 94,981
Blood flow	0,003	0,015	0,032	1	0,858	1,003	0,973 - 1,034
AVF aneurysm	- 1,772	1,414	1,57	1	0,21	0,17	0,011 - 2,717
AVF stenosis	1,783	1,415	1,587	1	0,208	5,945	0,371 - 95,196
AVF steal sy	2,497	1,349	3,43	1	0,064	12,151	0,864 - 170,8
Gender (F/M)	0,473	0,927	0,26	1	0,61	1,605	0,261 - 9,884
Age	0,143	0,061	5,523	1	0,018	1,154	1,024 - 1,3
HD vintage	0,009	0,006	1,916	1	0,166	1,009	0,996 - 1,021
DM	- 0,506	1,209	0,175	1	0,676	0,603	0,056 - 6,448
Infection	- 17,55	8408,19	0,00	1	0,998	0,000	0,000 -
Hematoma	- 15,869	7469,63	0,000	1	0,998	0,000	0,000 -

Logistic regression analysis: Chi squared=20,327, d.f. 11; Sig. p=0.041

CONCLUSIONS

The relative risk for vascular access-related hospitalization was 18,8 times greater in patients with stenosis, 17,9 times greater in patients with CVC in comparison to patients with AVF, 7,6 times greater in patients with vascular access infection and 3,18 times greater in males.

The relative all cause mortality risk was 12,75 times greater in patients with CVC in comparison to patients with AVF and 1,15 times greater in aged patients.

The results of the study confirmed the superiority of AVF in comparison with CVC with regard to HD adequacy, vascular access-related hospitalization rate, and mortality in hemodialysis patients.

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