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Angiographic restenosis after percutaneous coronary intervention in HIV-infected patients- incidence and predictors

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INTERDISZIPLINÄRES HIV ZENTRUM AM KLINIKUM RECHTS DER ISAR

Purpose

Patients infected with human immunodeficiency virus (HIV) are at risk of accelerated coronary arteriopathy. With the success of combined antiretroviral therapy, HIV infection has become a chronic condition and percutaneous coronary intervention (PCI) in HIV-infected patients has become an important treatment option. However, dedicated angiographic follow-up studies examining anti-restenotic efficacy in PCI-treated HIV-infected patients are lacking.

Methods

Patients with HIV infection who underwent coronary stenting were enrolled in a dedicated registry. Clinical and laboratory data were prospectively collected in an online database. Angiographic follow-up was scheduled at 6-8 months and predictors of restenosis were evaluated. To investigate individualls with multiple interventions in different segments, generalized estimating equation (GEE) models were employed to consider for repeated measurements (lesions) per subject within the analysis of group differences.

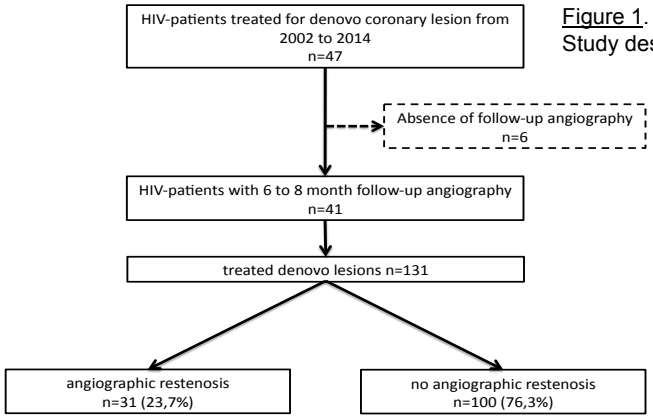

Figure 1. Study design

Results

A total of 47 HIV-infected patients were treated for denovo lesions and prospectively enrolled. Angiographic follow-up was available in 41 patients (87%) with 131 lesions.

Overall 103 (78%) lesions were treated with drug eluting stents (DES), 14 (11%) lesions with bare metal stents (BMS) and 14 (11%) lesions with PTCA balloon alone. Intraprocedural success rate was 100%. The total rate of binary angiographic restenosis was 24% with DES: 19% (p 0.032).

We observed an independent association of binary angiographic restenosis with an elevated CD-8 T cell count (p=0.001), a reduced CD4/CD8 ratio (p=0.036) or an elevated viral load (p=0.001). In GEE analysis, commonly known predictors for restenosis like diabetes or small vessel size are not associated.

			Angiographic restenosis				
	all patients n=41	%	Yes n=8		No n=33		p Value
Age, year	66,45		69,8		65,5		0,41
Men	36	(90,0)	7	(87,5)	29	(83,3)	0,53
Body mass index, kg/m^2	24,01	±0,1	24	±0,1	23,5	±0,1	0,18
Current smoker	17	(42,5)	2	(25,0)	15	(50)	0,08
Hypercholesterolemia	25	(62,5)	7	(87,5)	18	(56,3)	0,08
Hypertension	24	(60,0)	6	(75,0)	18	(56,3)	0,41
Diabetes mellitus	5	(12,5)	3	(37,5)	2	(6,3)	0,017
Multivessel disease	27	(67,5)	6	(75,0)	21	(65,6)	0,73
Stable coronary arteriy disease	13	(32,5)	3	(37,5)	10	(31,3)	0,87
NYHA I	12	(30,0)	1	(12,5)	11	(34,4)	0,29
NYHA II	12	(30,0)	3	(37,5)	9	(28,1)	0,29
NYHA III	6	(15,0)	1	(12,5)	5	(15,6)	0,29
NYHA IV	3	(7,5)	1	(12,5)	2	(6,25)	0,29

Table 1. Patient characteristics

			95% Wald-confidence intervall		Hypothesis testing	
	adjusted OR (95% CI)	standard error	lower	upper	Wald-Chi-Quadrat	p Value
Diabetes mellitus	1,199	,5066	0,444	3,237	,129	,720
Time since HIV diagnosis to PCI	1,038	,0325	0,973	1,106	1,279	,258
CD8 T cell cells/mm^3	1,002	,0007	1,001	1,004	10,089	,001
CD4/CD8 ratio	3,627	,6151	1,086	12,108	4,387	,036
Viral load copies/ml	1,000	0,00000	1,000	1,000	16,031	,00006
Vessel size, mm	0,776	,3170	0,417	1,444	,642	,423

Table 2. Multivariate generalized estimating equation (GEE)

	Angiographic restenosis				
	Yes n=31		No n=100		p Value
Left main coronary artery	1	(3,5)	4	(4,3)	0,57
Left anterior descending	14	(42,9)	45	(46,2)	0,84
Circumflex	14	(46,4)	27	(26,9)	0,12
Right coronary artery	2	(7,1)	24	(22,6)	0,61
History of myocardial infaction	8	(28,6)	25	(26,9)	0,61
Complex (type B2/C) lesion, n	18	(64,3)	61	(65,6)	0,59
Drug-eluting stent	20	(64,5)	83	(83,0)	0,032
Bare-metal stent	4	(7,1)	10	(8,6)	0,16
Vessel size, mm	2,72	±0,27	2,77	±0,29	0,37
stented lenght, mm	26,4	±3,1	27,2	±1,4	0,66
Data are shown as number (percentage) or median [standard error];					
	Angiographic restenosis				
	Yes n=31		No n=100		p Value
HIV related drugs					
protease inhibitor	21	(75,0)	61	(65,6)	0,20
NRTI*	21	(75,0)	71	(76,3)	0,36
NNRTI‡	11	(39,3)	44	(47,3)	0,81
Entry-Inhibitor	5	(17,9)	18	(19,3)	0,78
Time since HIV diagnosis to PCI, year	10,1	±2,2	12,7	±2,0	0,57
Duration of HIV-therapy, year	15,74	±0,05	14,97	±0,81	0,57
T cell count per mm^3	1951	±154	1730	±97	0,036
CD4 T cell count per mm^3	506,7	±42	490,7	±37	0,26
CD8 T cell count per mm^3	1103,3	±81	976,8	±57	0,016
CD4:CD8 ratio	0,58	±0,07	0,57	±0,06	0,89
Viral load, log copies/ml	4,4	±0,4	4,3	±0,3	0,82
C-reactive protein, mg/L	4,3	±3,1	8,1	±4,8	0,86

Data are shown as number (percentage) or median [standard error]; *NRTI denotes nucleoside reverse-transcriptase inhibitor; ‡NNRTI denotes non-nucleoside reverse-transcriptase inhibitor

Table 3. Lesion characteristics

Conclusions

The rate of angiographic in-stent restenosis in HIV-infected patients is considerably elevated. CD8 and CD4/CD8 ratio as HIV-specific inflammatory markers are independent predictors of elevated coronary restenosis. In GEE analysis, commonly known predictors for restenosis like diabetes or small vessel size are not associated.

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All authors declare no conflict of interests.