PROINFLAMMATORY MONOCYTES IS ASSOCIATED WITH MORTALITY IN HEMODIALYSIS PATIENTS

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Introduction

Despite the continuous improvement of dialysis technology and pharmacological treatment, mortality rates for dialysis patients are still high. Hemodialysis patients have a substantial cardiovascular disease burden. Monocyte heterogeneity is widely acknowledged and substantial evidence suggests that pro-inflammatory (CD16 positive) monocytes may contribute to the development of atherosclerosis.

Study Design, Methods & Results

We prospectively studied the predictive value of CD16 positive monocyte subtypes for total and cardiovascular death in 136 HD patients during a 5.6 years of follow-up. Monocyte subsets were measured by flow cytometry .CD16 positive monocytes were independently associated with both mortality after adjustment for variables in patients with pre-existing cardiovascular disease (CVD). Kaplan-Meier analysis revealed that CD16 positive monocytes counts in the highest quartile had a significantly higher all-cause mortality rate compared to the rest of the quartiles. However, in our analysis stratified by percentage of CD16, besides those in the highest quartile, patients in the lowest quartile also had an elevated adjusted hazard ratio for cardiovascular death (HR=6.26, p=0.01).

Table 1. Summary of the sample characteristics (n=136).

Variables	*n (%)*
Sex, female *vs.* male	62 (45.59) *vs.* 74 (54.41)
DM, no *vs.* yes	68 (50) *vs.* 68 (50)
Hypertension, no *vs.* yes	38 (27.94) *vs.* 98 (72.06)
Pre-existing CVD, no *vs.* yes	62 (46.62) *vs.* 71 (53.38)
	median (IQI)
pCD16, %	18.6 (15.6, 21.5)
HD vintage, year	6.04 (3.92, 9.04)
Age, year	59 (51.5, 69)
BMI, kg/m^2	23.62 (21.08, 25.32)
WBC, $10^3/mm^3$	6.6 (5.4, 7.5)
Monocyte,$10^3/\mu L$	5.9 (4.8, 7)
AbsoMono, cells/μL	367.2 (291.2, 482.4)
HsCRP, mg/L	2.8 (1.5, 3.8)
Hb, g/dl	11.2 (10.1, 12.2)
FBS, mg/dl	96 (82, 139)
HbA1c	6 (5, 7.1)
Albumin, g/dl	4.2 (4, 4.4)
Ferritin, ug/dl	679 (467, 838)
TG, mg/dl	115 (81, 187)
HDL, mg/dl	43.5 (34, 56)
Cholesterol, mg/dl	163 (140, 189)
BUN, mg/dl	66.5 (58.1, 75.7)
Cr, mg/dl	10.5 (9.2, 11.9)

Table 2. The univariate Cox regression analysis results for death risk.

Outcome types	CVD			All causes		
Covariates	HR	95% CL	p-value	HR	95% CL	p-value
pCD16 level, %						
Q1 *vs.* Q2	1.45	0.46 4.57	0.525	1.38	0.58 3.27	0.466
Q3 *vs.* Q2	2.2	0.74 6.57	0.158	1.87	0.81 4.33	0.142
Q4 *vs.* Q2	5.22	1.93 14.08	0.001 *	3.48	1.6 7.56	0.002 *

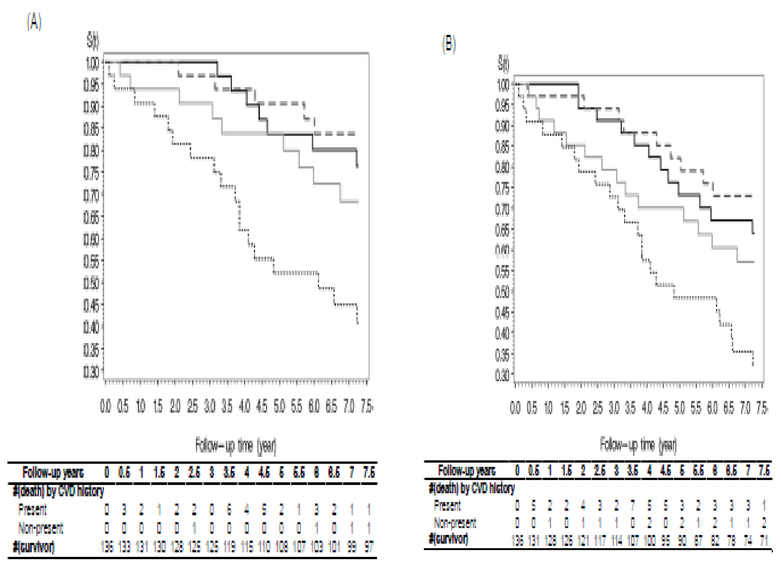

Figure 1 The Kaplan-Meier curves of all –cause death: the lowest to the highest quarters were indicated by black solid line, gray dashed line , gray solid line, and black dotted line.

Figure 2 The Kaplan-Meier curves of CV death: the lowest to the highest quarters were indicated by black solid line, gray dashed line , gray solid line, and black dotted line.

Conclusion

We found that CD16 positive monocytes were independently associated with both cardiovascular and all-cause mortality in HD patients with pre-existing CVD. Nevertheless, a subset of patients with monocyte counts close to the normal range also portends a poor prognosis

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