Expression of Toll-Like Receptors (TLR) and Cathelicidin in Hemodialysis (HD) Patients with Vitamin D Deficiency

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INTRODUCTION

Patients in hemodialysis (HD) may have 25 (OH) D (vit D) deficiency which is associated with inflammation, impaired immunity and increased susceptibility to infections. Moreover, vit D may regulate toll-like receptors (TLR) and antimicrobial peptides (cathelicidin) that are involved in the immunological response. Besides, data on expression of TLR and cathelicidin in HD patients with deficiency of vit D is limited.

OBJECTIVE

To evaluate the expression of TLR-2 and TLR-4 in leukocytes and serum levels of cathelicidin in HD patients with deficiency of vitamin D.

METHODS

Fresh blood samples from 38 HD patients without inflammation/or infection (< 1month) clinical symptoms and 31 age-and gender-matched controls were analyzed to TLR2 –APC and TLR4-PE Cy7 expression in neutrophils (PMN); monocytes (MN) and lymphocytes (Linf) by flow cytometry . We also measured serum levels of cathelicidin (EIA), C-reactive protein (CRP) and vit D 25(OH) D_3 (chemiluminescence).

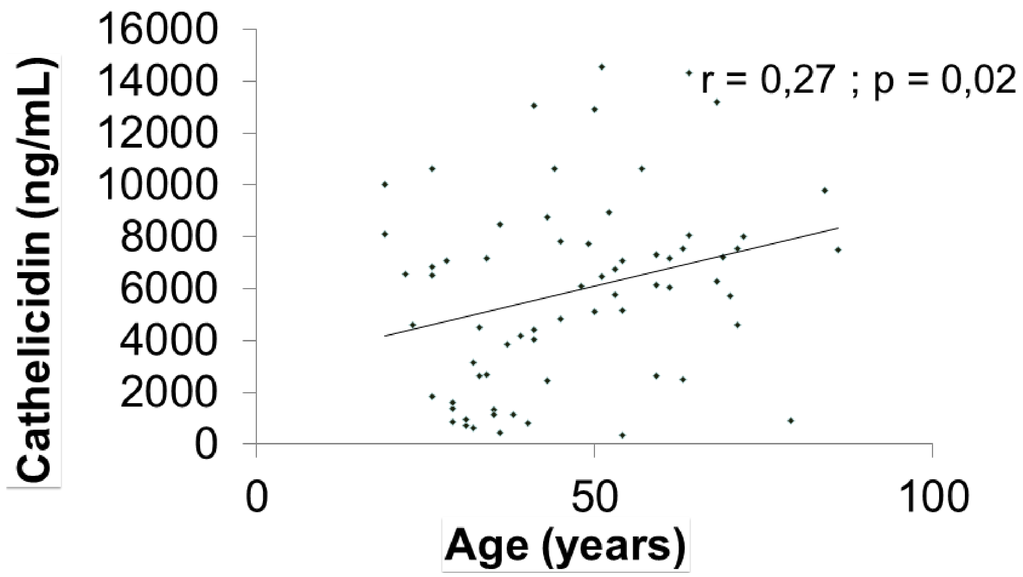
RESULTS

We observed a negative correlation between age and Vitamin D (r = - 0.31 ; p = 0.01). Although we have observed a negative correlation between vitamin D and TLR 2 and TLR4 expression on PMN and MN, this correlation was not statistically significant (data not shown).

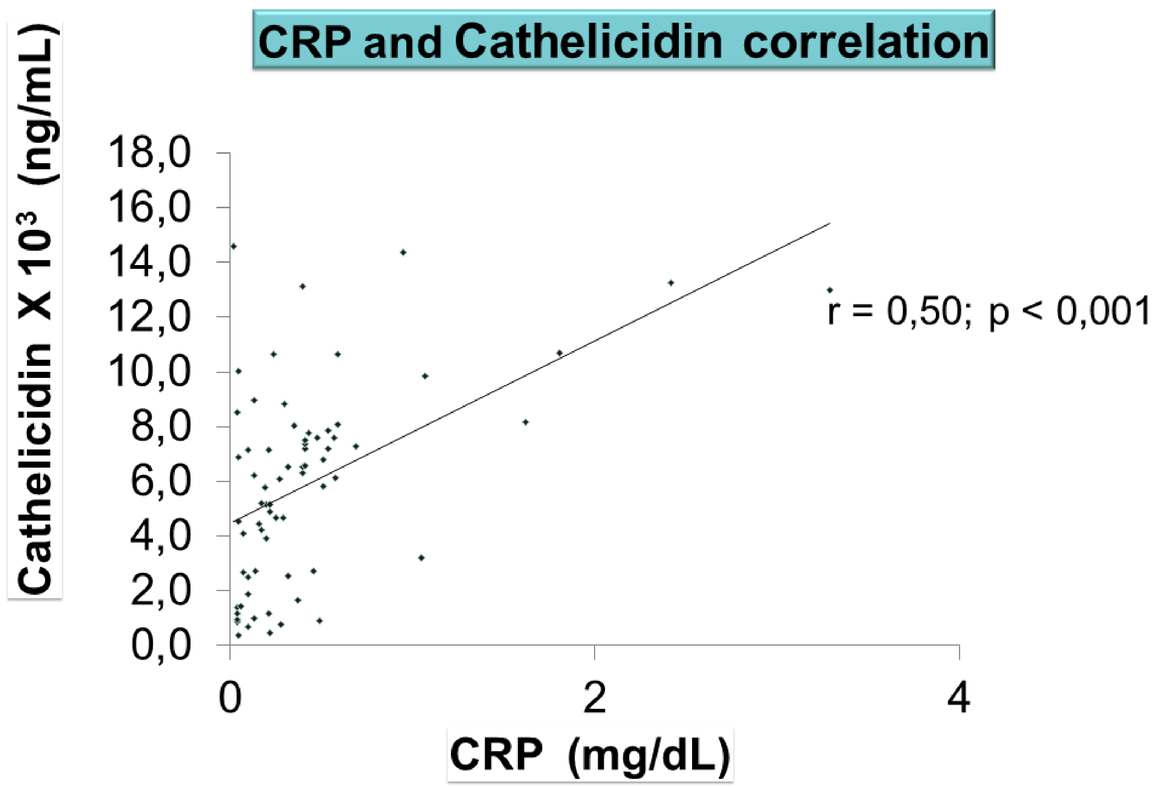
Table 1. Biochemical and laboratory data

	HD (n = 38)	Controls (n = 31)	p
TLR expression on neutrophils			
TLR2	313±168	249±56	0.04
TLR4	212±157	121±35	0.02
TLR expression on Monocytes			
TLR2	369±210	269±144	0.008
TLR4	107±144	82±66	0.5
C-reactive protein (mg/dL)	0,51±0,65	0,25±0,23	0,04
Cathelicidin (ng/mL)	6810±3514	4687±3418	0,01
25 (OH) D ng/mL	19±7	26±7	0,008

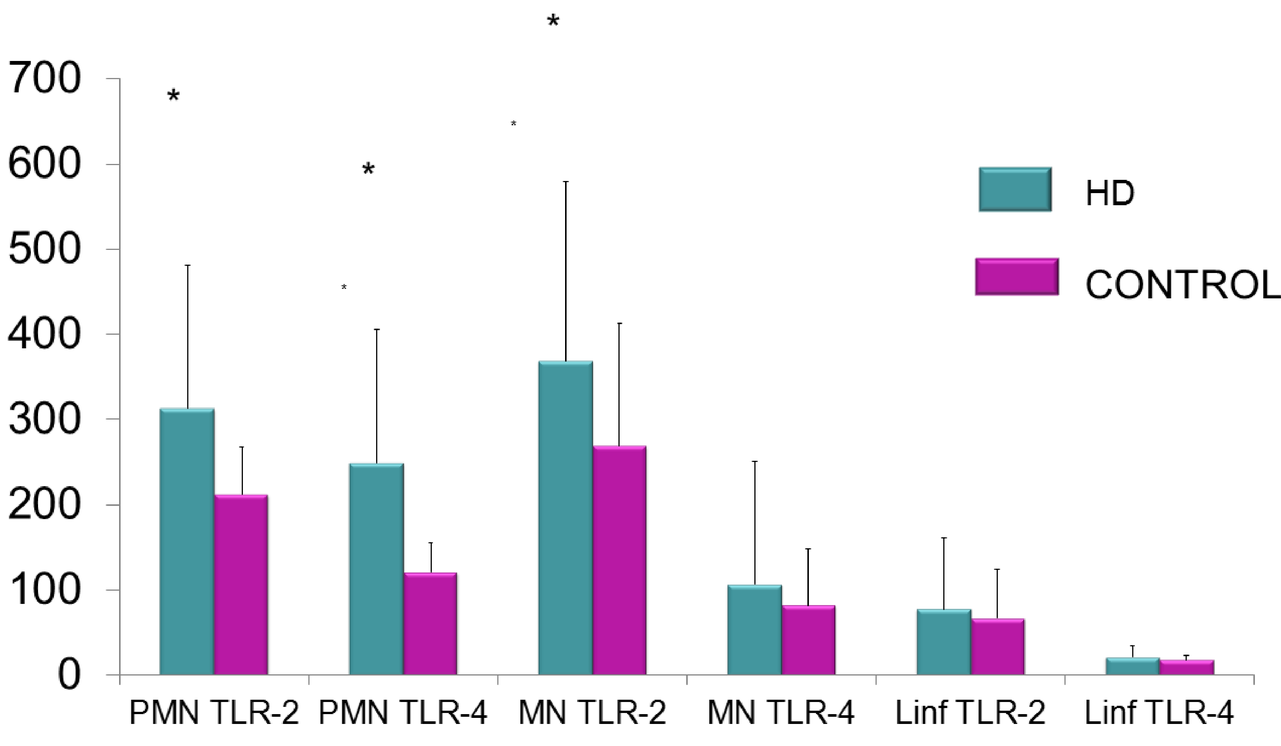
Age and Cathelicidin correlation



CRP and Cathelicidin correlation



TLR 2 and 4 Expression on neutrophils, monocytes and lymphocytes in hemodialysis patients and healthy subjects



DISCUSSION

The high TLR2,TLR4 and cathelicidin expression suggest a priming inflammatory state observed in hemodialysis patients. Besides, the association between cathelicidin and CRP, suppose that this peptide may also considered as an inflammatory marker. In respect to Vit D, HD patients had concentration serum levels less than 20 ng/mL . So, it is possible that these low concentration levels have not been enough to downregulate TLR2, 4 and cathelicidin expression and consequently diminish the inflammation in HD patients.

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