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LETTER TO THE EDITOR

Hyaluronic acid in end-stage renal disease treated by hemodialysis

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Chronic viral B and C hepatitis and liver cirrhosis are more frequent in patients with end-stage renal disease (ESRD) treated by hemodialysis than in general population [the prevalence of hepatitis C virus (HCV) infection: 9–65% worldwide with annual incidence of infection ranges from 0% to 2.4%,[1,2] and that of hepatitis B virus (HBV) infection: 1% in USA and up to 15.3% in Asia[3]], and have a more severe evolution, particularly on account of the aggravation of liver fibrosis. Liver puncture biopsy, the gold standard for assessing liver fibrosis, has a higher risk of complications in hemodialysis patients: 13.2%.[4]

Serum hyaluronic acid is a non-invasive marker for liver fibrosis in chronic B and C viral hepatitis in general population, but is less used in ESRD patients undergoing hemodialysis. High plasma hyaluronic acid levels have already been described in ESRD and is previously reported that the duration on hemodialysis and certain markers of chronic inflammation, such as dialysis-related amyloid, is correlated with hyaluronic acid levels.[5,6] Cytokine production may be stimulated by contact of the blood with bioincompatible dialysis membranes, and cytokines have been shown to stimulate hyaluronic acid synthesis.[4] Hyaluronic acid level is a good non-invasive marker for the differentiation of liver fibrosis stages 1, 2 and 3 in hemodialysis patients with hepatitis B and C, but its efficiency to differentiate chronic hepatitis from liver cirrhosis was not demonstrated. Hyaluronic acid has the highest clinical utility for stage 1 of liver fibrosis (clinical net benefit 0.22%) in patients with ESRD and chronic hepatitis B or C.[7]

The aim of our research is to evaluate if ESRD under hemodialysis influence the serum level of hyaluronic acid in chronic viral liver diseases in Romanian patients. The genotype profile of HCV infection in our area is being dominated by genotype 1b, the most aggressive (92.6%)[8] and genotype D (70%), followed by genotype A (30%) characterize the molecular epidemiology of HBV.[9] We performed a prospective multicenter, transversal study, which included 83 ESRD patients (dialysis vintage: 132.59 ± 86.02 months): 31 with HBV and 52 with HCV and a group of 76 patients without ESRD: 25 with HBV and 51with HCV. Patient characteristics and the comparison of the studied parameters between patients with and without ESRD are summarized in Table 1. Our results support the contribution of ESRD to the increase of hyaluronic acid levels. There was

Table 1. Comparison of the studied parameters between the group with chronic viral hepatitis B and C with and without ESRD treated by hemodialysis.

	With ESRD				Without ESRD				*p*
Age (years)	Mean ± SD 55.57 ± 14.46				54.73 ± 13.26				0.184
Sex (F/M) (%)	58.33/41.67				56.1/43.9				0.767
HA (ng/dL)									
	No.	Median	25%	75%	No.	Median	25%	75%	
VHB and VHC	83	54.97	28.09	93.84	76	29.27	13.30	97.32	0.065
VHB	3141.61		33.51	89.58	2514	5013	10	56.32	0.060
VHC	5255.08		27.92	97.04	5134	4314	65	107.21	0.268
F1	36	33.60	20.02	70.59	30	15.40	12.95	40.44	**0.021**
F2	18	64.88	24.28	8.58	16	53.89	31.83	12.98	0.476
F3	17	88.53	31.76	118.15	17	21.73	12.65	70.42	0.189
F4	1289.94		45.43	126.50	13	161.09	13.87	388.08	0.731
Fibroscan	Median		25%	75%	Median		25%	75%	
	7.95		5.95	12.9	10.2		6	16.6	0.493

Notes: Bold value indicates significant p value < 0.05.
ESRD, end-stage renal disease; SD, standard deviation; HA, serum hyaluronic acid; VHB, chronic viral hepatitis B; VHC, chronic viral hepatitis C; F1, liver fibrosis.

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a monotonous positive correlation between hyaluronic acid values and the months of dialysis (Spearman correlation coefficient $\rho = 0.39$, $p < 0.001$) and there was no correlation between hyaluronic acid and dialysis efficiency (Spearman correlation coefficient $\rho = 0.45$, $p = 0.087$). Hyaluronic acid values were higher for all liver fibrosis stages (assessed by Fibroscan) in patients with chronic viral hepatitis B and C with ESRD compared to both HBV- and HCV-infected patients with no ESRD, but the statistically significant difference was present only for stage 1 of liver fibrosis. No statistical correlation was found between age and gender, suggesting that ESRD and liver fibrosis were the main factors associated with the increase of hyaluronic acid levels.

Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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