

LIPOPROTEIN SUBFRACTIONS, SERUM URIC ACID AND CARDIOVASCULAR DISEASE – IS THERE A LINK?

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INTRODUCTION. Cardiovascular disease (CAD) is currently one of the most common causes of deaths in end-stage renal disease patients. It has been suggested that serum uric acid level is a cardiovascular risk factor, however, this relation has not been fully explained. We proposed that serum uric acid (SUA) may partly participate in the relationship between individual lipoproteins subfractions and cardiovascular risk. Some studies suggest that despite the fact that in general population hyperuricemia is associated with higher cardiovascular risk, in haemodialysis patients increased SUA levels may be related to lower risk of all-cause and CV mortality.

AIM. The aim was to assess whether there is an association between uric acid (quantiles) and lipoprotein fractions in dialysis patients with and without CAD

MATERIALS AND METHODS. 55 dialysis patients (31 with CAD, 24 without CAD) were enrolled in this study. Lipoprotein subfractions were measured in blood with the use of Lipoprint system (Quantimetrix). Moreover, uric acid and other biochemical parameters were determined. The association between uric acid quartiles and HDL and LDL cholesterol subfractions and differences in lipoproteins subfractions between dialysis + CAD and dialysis non-CAD patients were analysed.

RESULTS. The analysis of HDL and LDL subfractions distribution of between dialysis+CAD and dialysis non-CAD patients demonstrated no significant differences. However, study of the relationship between uric acid levels quartiles and lipoproteins distribution, revealed that levels of HDL5 (p=0.025), HDL6 (p=0.045) and intermediate HDL (HDL4-HDL7) (p=0.018) were significantly decreasing along with increasing concentration of uric acid. Moreover, we observed reduced levels of total HDL and increased IDL-B (0.037) in patients with high SUA concentration (p=0.013).

TABLE 1.	SUA: 0-Q1 (*) 0 – 306,25 µmol/l	SUA: Q1-Q2 (#) 306,25 - 336,0 µmol/l	SUA: Q2-Q3 (^) 336,0 - 395,75 µmol/l	Q3-100 395,75 – 100 µmol/l	p
Age	68.8±13.7	65.0±13.2	65.7±9.3	66.2±10.2	NS (0.955)
HDL 1	6.5 (3.5-10.25)	5.0 (2.5-10.5)	7.5 (3.75-8.0)	3.0 (2.5-4.5)	NS (0.288)
HDL2	10.0 (6.25-10.75)	8.0 (5.0-13.5)	10.5 (7.0-12.0)	6.0 (4.0-7.5)	NS (0.234)
HDL3	5.0 (3.25-6.0)	4.0 (2.5-7.0)	5.0 (3.75-7.25)	4.0 (2.0-4.0)	NS (0.303)
HDL4	5.5 (4.25-6.0)	5.0 (3.5-6.5)	5.5 (3.75-7.25)	4.0 (3.0-4.0)	NS (0.130)
HDL5	6.0 (5.25-6.75)	5.0 (3.5-6.5)	5.5 (5.0-6.25)	3.0 (3.0-4.5) *P=0.022; ^P=0.020	P=0.025
HDL6	11.0 (8.5-12.0)	7.0 (6.5-9.0)	9.0 (8.75-12.5)	4.0 (4.0-9.0)	P=0.045
HDL7	3.0 (2.25-3.75)	2.0 (2.0-2.5)	2.5 (2.0-3.75)	1.0 (1.0-3.0)	NS (0.234)
HDL8	3.0 (2.25-3.0)	2.0 (2.0-2.0)	2.0 (1.75-3.25)	1.0 (0.5-3.0)	NS (0.270)
HDL9	2.0 (2.0-2.0)	2.0 (1.5-2.0)	1.5 (1.0-2.75)	1.0 (0.5-2.5)	NS (0.604)
HDL10	3.0 (2.25-3.0)	2.0 (1.5-3.5)	2.0 (1.75-5.25)	0 (0-4.0)	NS (0.739)
Large HDL	21.5 (13.0-27.0)	17.0 (10.0-31.0)	22.5 (15.25-25.5)	13.0 (8.5-15.0)	NS (0.237)
Intermediate HDL	25.5 (21.0-27.75)	20.0 (16.0-23.0)	23.5 (21.75-27.5)	13.0 (11.0-19.5) *P=0.044; ^P=0.032	P=0.018
Small HDL	8.0 (6.5-8.75)	6.0 (4.0-7.5)	5.0 (4.75-11.25)	1.0 (0.5-9.5)	NS (0.510)
Total HDL	52.5 (47.25-59.25)	42.0 (34.0-58.5)	53.0 (48.0-58.5)	28.0 (27.5-37.5) *P=0.009; ^P=0.002	P=0.013
LDL VLDL	25.0 (19.5-30.5)	31.0 (21.0-45.5)	38.5 (27.0-63.5)	24.0 (14.0-36.5)	NS (0.225)
LDL IDLC	17.0 (11.5-24.5)	19.0 (17.0-28.5)	23.0 (13.75-42.25)	13.0 (9.0-15.0)	NS (0.067)
LDL IDLB	13.0 (9.0-16.5)	19.0 (11.0-23.5)	19.5 (17.25-29.75)	11.0 (7.5-14.5)	P=0.037
LDL IDLA	13.0 (11.0-17.0)	20.0 (10.5-43.0)	27.5 (11.25-32.25)	15.0 (5.5-16.5)	NS (0.317)
LDL1	22.0 (20.5-35.5)	24.0 (21.0-47.5)	40.0 (18.5-52.75)	21.0 (15.0-39.0)	NS (0.520)
LDL2	5.0 (4.0-9.0)	2.0 (0-9.5)	6.0 (3.75-16.0)	5.0 (3.0-12.5)	NS (0.686)
LDL3	0	0	0 (0-0.25)	0 (0-3.0)	NS (0.209)
LDL4	0	0	0	0 (0-0.5)	NS (0.362)
LDL5	0	0	0	0	NS
LDL6	0	0	0	0	NS
LDL7	0	0	0 (0-2.25)	0 (0-2.0)	NS (0.590)
AIP log	0.39 (0.22-0.45)	0.57 (0.24-0.65)	0.34 (0.25-0.60)	0.60 (0.47-0.75)	NS (0.159)
AIP high risk	4 (80.0)	4 (66.7)	5 (83.3)	5 (100.0)	NS (0.843)

CONCLUSIONS. This study revealed an association between SUA and HDL intermediate subfractions. It now seems that the quality of cholesterol may be more important than its quantity. This study suggests that intermediate HDL subfractions along with SUA level may be associated with increased cardiovascular risk in dialysis patients.

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