SUBCLINICAL CAROTID ATHEROSCLEROSIS IS RELATED TO CLASSICAL RISK FACTORS AND OXIDATIVE STRESS IN CHRONIC KIDNEY DISEASE PATIENTS

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OBJECTIVES

- ✓ Chronic kidney disease (CKD) associates with increased inflammation and oxidative stress (OS), leading to paradoxically increased burden of atherosclerotic cardiovascular disease (CVD) in these patients.
- ✓ Carotid intima-media thickness (IMT) and the presence of carotid plaques have been associated with increased cardiovascular risk in several populations although their relation to indices of renal dysfunction has been under investigation with controversial results.

Aim of our study was to investigate the association of subclinical carotid atherosclerosis markers with pro-atherogenic factors such as increased inflammation and OS in a population of non-dialysis CKD patients

PATIENTS and METHODS

PATIENTS

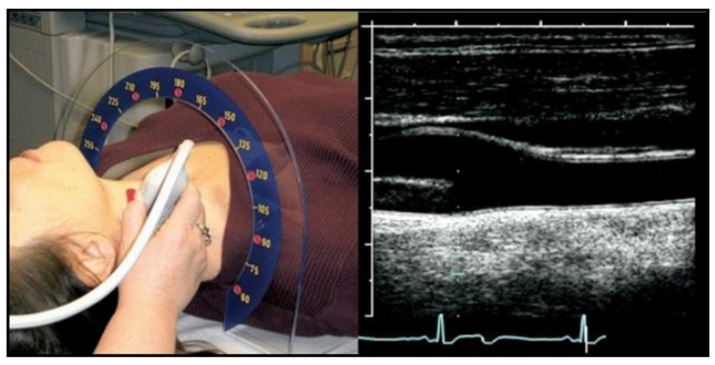
80 consecutive patients with established **CKD** (stages 2-5) with **no previous history of CVD**

- ➢ Mean age 60 years, males 55%
- ➢ Mean eGFR-MDRD was 45 ml/min/1.73 m^2
- ➢ Median 24h urine protein content was 420 mg

METHODS

Indices of **Inflammation, endothelial dysfunction and oxidative stress** [Interleukin-6, TNFa, fibrinogen, VCAM-1, ICAM-1, oxidized LDL, 8-isoprostanes]

Common carotid **Intima media thickness (IMT)** – **Carotid plaques**



Ultrasound ATL, HDI 5000, Bophell, WA, USA

RESULTS

Population descriptives, n=80

Hypertension, n (%)	70 (88)
Diabetes, n (%)	22 (28)
Smoking, n (%)	15 (19)
Body mass index, kg/m^2	27.5±4.9
Waist circumference, cm	98±11
Systolic BP, mmHg	143±16
Diastolic BP, mmHg	82±10
Pulse pressure, mmHg	58 (12, 109)
Glucose, mg/dl	104 (73, 358)
Uric acid, mg/dl	7.0±2.0
Hemoglobin, g/dl	13.4±1.7
Total cholesterol, mg/dl	225±49
HDL-cholesterol, mg/dl	53±11
Triglycerides, mg/dl	152 (39, 474)
Calcium, mg/dl	9.4±0.5
Phosphate, mg/dl	3.4±0.8
$CaXPO^4$ product	31.8±6.7
Interleukin 6, pg/ml	2.3 (0.6, 12.4)
Fibrinogen, mg/dl	467 (200, 990)
VCAM, ng/ml	805 (376, 2262)
ICAM-1, ng/ml	282 (136, 759)
TNFa, pg/ml	1.9 (0.5, 24.7)
8-isoprostanes, pg/ml	116 (78, 455)
Oxidized LDL, U/l	76.7±23.6
IMT, mm	0.65 (0.44, 1.35)
IMT >0.8, n (%)	14 (18)
Carotid plaques, n (%)	18 (23)

Association analysis – Increased IMT>0.8 mm

Univariate Analysis

	r	P value
Age	0.409	<0.001
Male gender	0.284	0.011
Diabetes	0.232	0.038
Systolic BP	0.336	0.002
Ln(Pulse Pressure)	0.259	0.020
Ln(Glucose)	0.234	0.036
PO^4	-0.229	0.041
$CaXPO^4$	-0.235	0.036
Ln(Fibrinogen)	0.275	0.014

Multivariate Analysis – Nagelkerke's R^2 0.515

	Odds ratio	P value
Age	1.23	0.006
Male gender	16.753	0.007
Systolic BP	1.05	0.049

Association analysis – Carotid plaques

Univariate Analysis

	r	P value
Age	0.266	0.017
Waist circumference	0.239	0.032
Systolic BP	0.274	0.014
Ln(Pulse Pressure)	0.341	0.002
Ln(Glucose)	0.375	0.001
Ln(8-isoprostanes)	0.223	0.047

Multivariate Analysis – Nagelkerke's R^2 0.332

	Odds ratio	P value
Age	1.08	0.048
Ln(Pulse Pressure)	1.05	0.025
Ln(8-isoprostanes)	12.87	0.013

eGFR or proteinuria level were not found to associate with increased IMT >0.8 mm or the presence of carotid plaque

CONCLUSIONS

In a population of non-dialysis CKD without known CVD

- ✓ Traditional risk factors (age, male gender, systolic BP) were the main determinants of subclinical carotid atherosclerosis
- ✓ Oxidative stress (8-isoprostanes) is significantly associated with the presence of carotid plaques
- ✓ Subclinical carotid atherosclerosis was not associated with worsening indices of renal dysfunction (eGFR and proteinuria)

Category: J6) Chronic Kidney Disease. Nutrition, inflammation and oxidative stress

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