

Arteriolar and glomerular intrarenal adiponectin staining in a rat model of incipient diabetic nephropathy

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OBJECTIVES

Adiponectin is an adipokine with anti-inflammatory, antiatherogenic and insulin-sensitizing effects, it also has antiproteinuric and nephroprotective actions. Low plasma adiponectin levels are found in diabetes. We quantified, for the first time to our knowledge, intrarenal amount of adiponectin in a setting of experimental incipient diabetic nephropathy and described relationship with severity of diabetes associated kidney disease

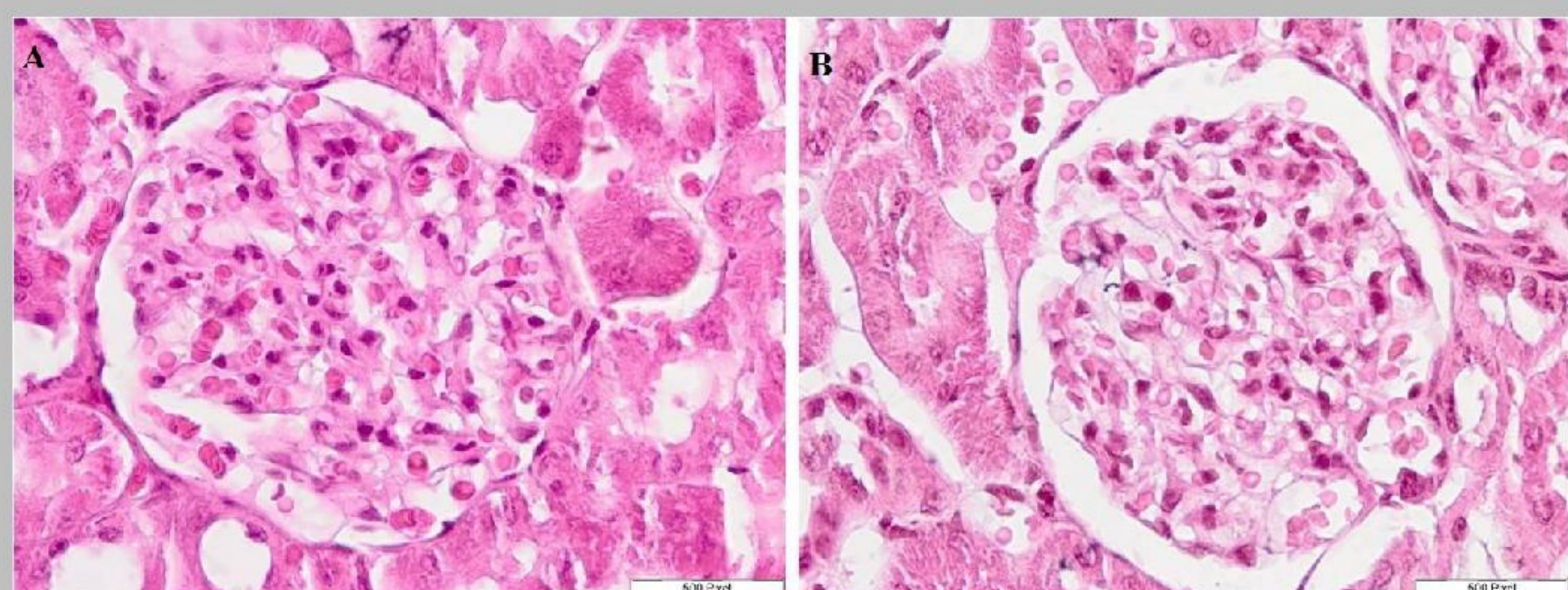
METHODS

Twenty male Wistar rats received lipid supplementation under the form of daily gavage of 2 ml pork fat consisting of 99.6% lipids, 0.2% proteins and 0.2% glucides with a caloric content of 9.28 kcal/ml; After three weeks of lipid rich diet, diabetes was induced by a low dose intraperitoneal streptozotocin injection (0.35mg*kg⁻¹) obtaining a model equivalent to type 2 diabetes. Animals were prospectively followed up for another 10 weeks. At forty-eight hours after induction of diabetes (T3) and before sacrifice (T13) creatinine and lipid profile were obtained, at T13 urinary albumin/creatinine ratio was measured. Twenty control animals were similarly evaluated. Renal histology was evaluated (PAS, HE) and intrarenal adiponectin in arterioles and glomeruli was analyzed using confocal laser scanning fluorescence microscopy, with automatic point-by-point fluorescence quantification using ZEN software.

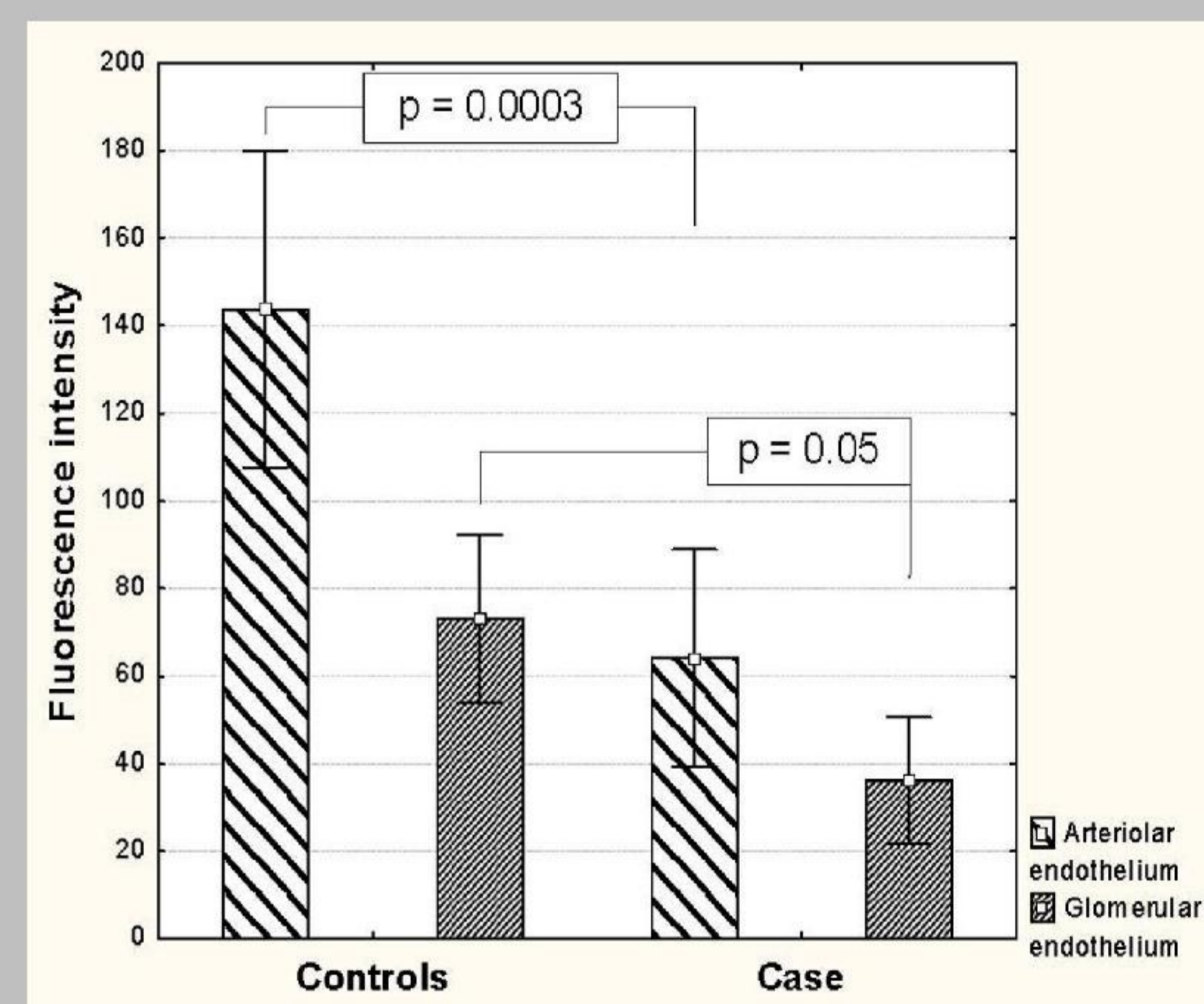
RESULTS

	Parameter	Case	Control	p
T3	Creatinine (µmol/l)	37.128±6.188	31.82±2.65	0.008
	Cholesterol (mmol/l)	2.55±0.88	1.62±0.23	<0.0001
	HDL cholesterol (mmol/l)	0.48±0.31	1.09±0.14	<0.0001
	Triglycerides (mmol/l)	10.13±8.39	0.57±0.07	<0.0001
	Adiponectin (µg/ml)	13.06±5.46	21.57±10.78	0.007
T13	Creatinine (µmol/l)	32.71±4.42	36.24±5.30	0.04
	Cholesterol (mmol/l)	2.07±1.28	1.86±0.24	0.57
	HDL cholesterol (mmol/l)	0.79±0.27	1.20±0.18	<0.0001
	Triglycerides (mmol/l)	4.17±9.31	1.12±0.34	0.001
	Adiponectin (µg/ml)	17.13±10.79	17.11±8.55	0.81
	Albuminuria (g/24 h)	0.63±1.48	0.05±0.05	0.0002
	UACR (mg/g creatinine)	0.08±0.15	0.01±0.01	0.003
	Diuresis (ml/24 h)	44.50±36.55	7.00±2.71	<0.0001

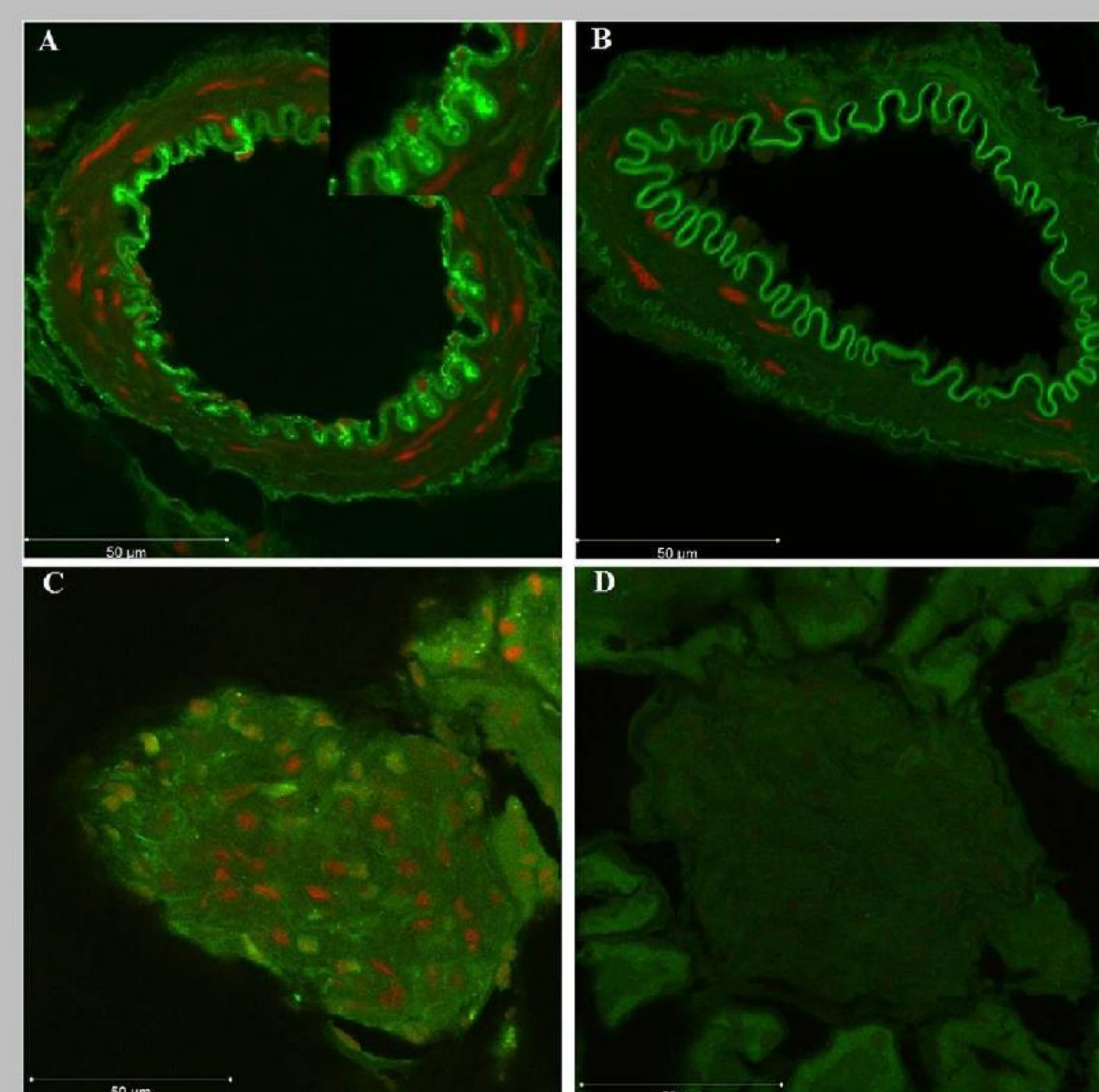
Comparison between case and control animals



Light microscopy of diabetic (A) and control animals (B).



Comparison of fluorescence intensity in diabetic animals versus controls



Confocal Laser Scanning immunofluorescence of arterioles in control (A) and diabetic (B) animals and of glomeruli in control (A) and diabetic (B) animals. Autofluorescence of elastin of internal elastic lamina is visible in both cases in the arterioles.

CONCLUSIONS

Intrarenal endothelial adiponectin is reduced in incipient diabetic nephropathy of a hyperlipidemic diabetic rat model.

