MMP-2 and TIMP-2 as the players in various types of primary glomerulonephritis

Katarzyna Gniewek, Magdalena Krajewska, Katarzyna Jakuszko, Katarzyna Kościelska-Kasprzak, Marta Myszka, Marian Klinger

Department of Nephrology and Transplantation Medicine, Wrocław, Poland

Wroclaw Medical University

INTRODUCTION AND AIM

MMP-2 belongs to a large family of matrix metalloproteinases (MMPs) - zinc dependent endopeptidases known for their ability to cleave extracellular matrix (ECM). MMP-2 is also called gelatinase due to its ability to degrade the compounds of basement membrane: types IV and V collagens, aggrecan, elastin and gelatins. TIMP-2 is an endogenous inhibitor of MMP-2. In the physiological circumstances they play an important role in maintaining homeostasis between production and degradation of ECM. The imbalance of these two processes is supposed to cause an increase in ECMs and glomerular sclerosis. The aim of the study was to verify the presence and levels of MMP-2 and TIMP-2 in correlation with clinical activity of nephropathy in patients with primary glomerulonephritis (GN).

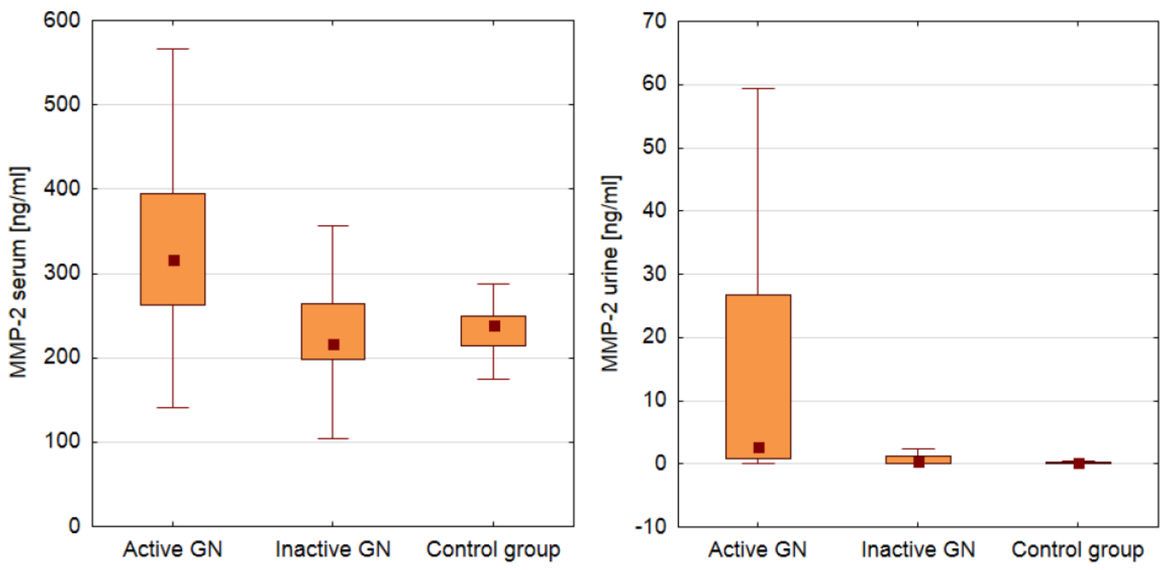
METHODS

The study included 120 patients aged 1-86 (mean 39.41±19.1 years) with diagnosed or suspected primary GN. The control group included 29 healthy volunteers aged 41.47±10.75 years. The study group was divided into subgroups of active and inactive disease, based on daily proteinuria and the presence of active urinary sediment.

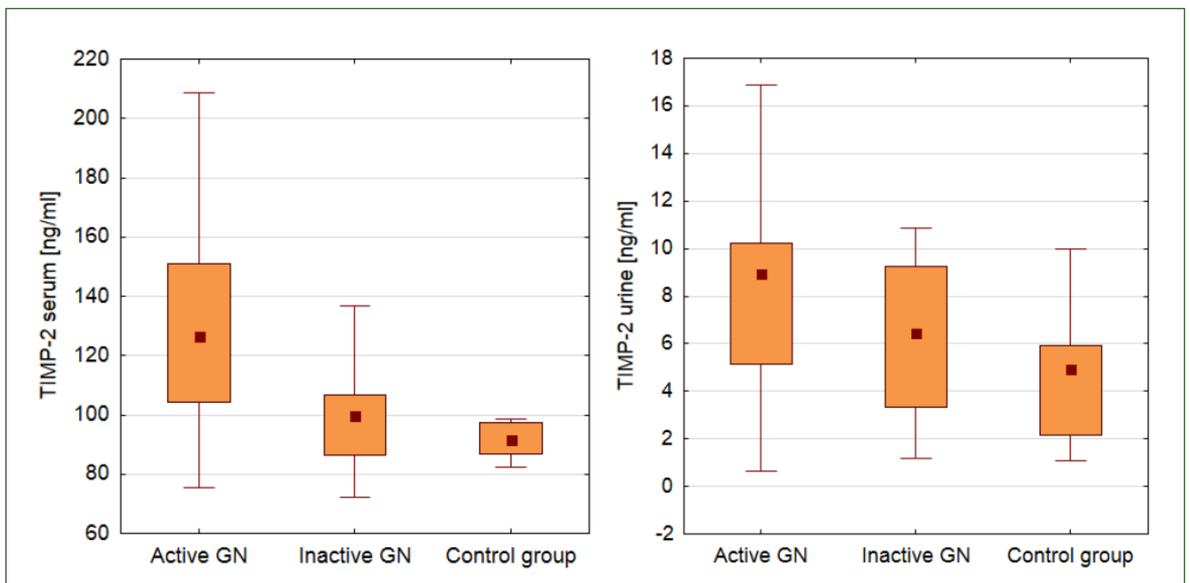
Group	Active GN	Inactive GN	Control group
patients [n]	57	63	29
women/men [n, (%)]	28 (49,1%) / 29 (50,9%)	26 (41,3%) / 37 (58,7%)	15 (51,7%) / 14 (48,3%)
age at the time of GN diagnosis [years]	37.9±24.2 (42.5)	27.7±19.1 (25.0)	-
age at the time of the study [years]	43.3±21.3 (45.0)	34.5±15.2 (31.0)	41.5±10.8 (40.0)
disease duration [years]	5.97±10.9 (4.0)	6.8±9.4 (3.0)	-

The concentrations of MMP-2 and TIMP-2 were measured using commercially available tests: Human MMP-2 Immunoassay, DMP2F0; Human TIMP-2 Immunoassay, DTM20 (R&D Systems).

RESULTS



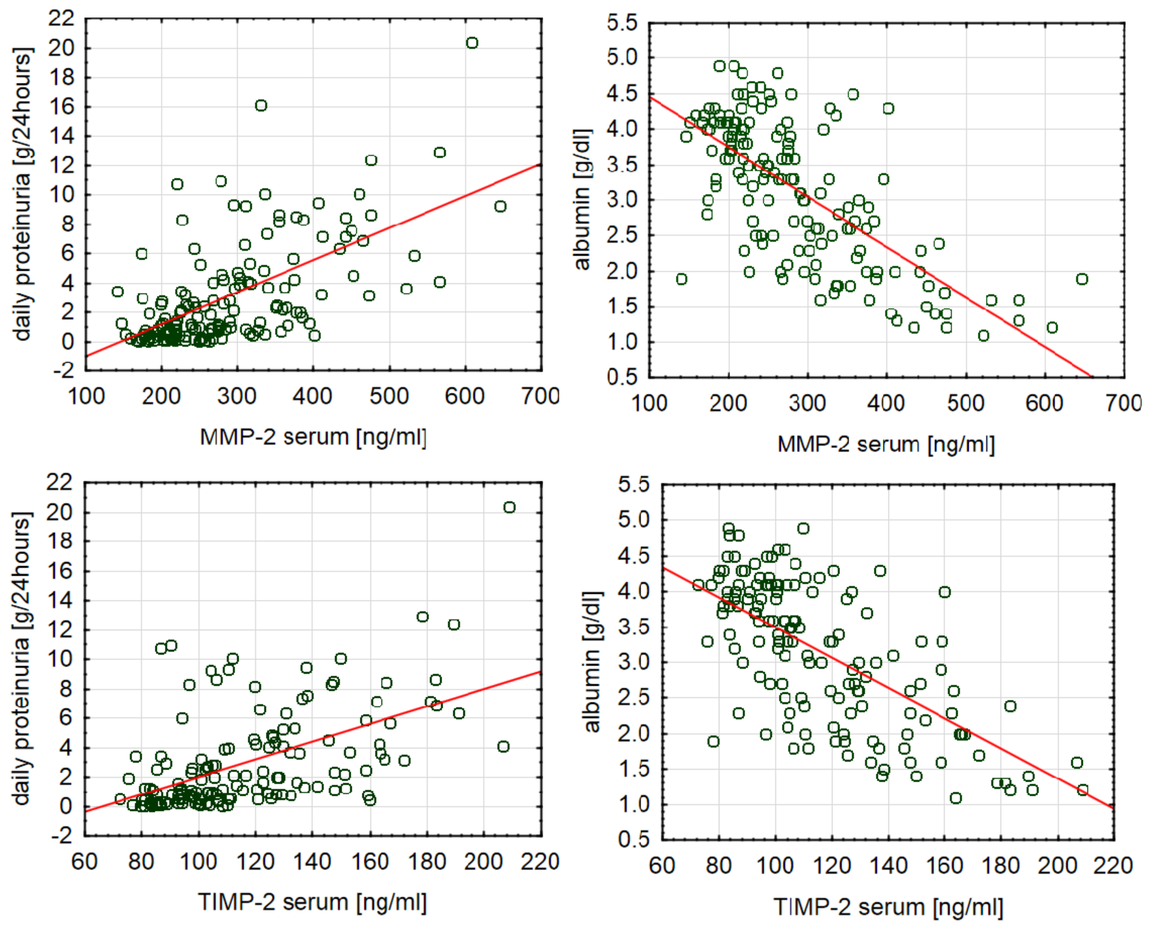
The highest concentrations of MMP-2 and TIMP-2 occurred in serum and urine from patients with active GN.
MMP-2 serum: 337.8±104.3 vs 231.2±47.9 ng/ml, p=0.001
MMP-2 urine: 28.7±57.8 vs 2.4±8.8 ng/ml, p=0.001



TIMP-2 serum: 132.5±33.3 vs 101.7±20.1 ng/ml, p=0.001
TIMP-2 urine: 15.1±22.8 vs 7.1±6.6 ng/ml, p=0.02

	daily proteinuria	total protein	albumin	total cholesterol	triglicerides
MMP-2 serum	rs=0.59; p<0.001	rs=-0.63;p<0.001	rs=-0.67;p<0.001	rs=0.48; p<0.001	rs=0.38; p<0.001
MMP-2 urine	rs=0.56; p<0.001	rs=-0.63;p<0.001	rs=-0.63;p<0.001	rs=0.4; p<0.001	rs=0.28; p=0.001
TIMP-2 serum	rs=0.56; p<0.001	rs=-0.59;p<0.001	rs=-0.66;p<0.001	rs=0.45; p<0.001	rs=0.30; p<0.001
TIMP-2 urine	rs=0.38; p<0.001	rs=-0.45;p<0.001	rs=-0.40;p<0.001	rs=0.29; p<0.001	rs=0.15; p=0.03

Significant correlations between serum and urine MMP-2 and TIMP-2 levels and the clinical disease activity biomarkers were found - positive with daily proteinuria, total cholesterol and triglicerides and negative with total protein and albumin concentrations.



CONCLUSIONS

The study confirmes the importance of serum and urine levels of MMP-2 and TIMP-2 as biomarkers of active glomerulonephritis.

REFERENCES:

[1] Bauvois B, Mothu N, Nguyen J, Nguyen-Khoa T, Nöel LH, Jungers P. Specific changes in plasma concentrations of matrix metalloproteinase-2 and -9, TIMP-1 and TGF-b1 in patients with distinct types of primary glomerulonephritis. Nephrol Dial Transplant (2007) 22: 1115–1122

51ERA-EDTA 358--SP

K) Clinical Nephrology, primary and secondary glomerulonephritis.

Katarzyna Gniewek

DOI: 10.3252/pso.eu.51era.2014

Poster presented at: 51 ERA-EDTA CONGRESS AMSTERDAM 2014

PosterSessionOnline.com