SIGNIFICANCE OF LIPOCALIN-2 (NEUTROPHIL GELATINASE-ASSOCIATED LIPOCALIN [NGAL]) DETECTION IN THE DIAGNOSIS OF KIDNEY TRANSPLANT REJECTION

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Introduction:

Many kidney diseases eventually lead to chronic renal deficiency. In these cases transplantation is the best method of treatment. However, in time renal transplant may lose its function too. As certain causes of dysfunction can lead to graft death in a very short time it is necessary to make a rapid and correct diagnosis. Today, one of the most significant early biomarkers is neutrophil inflammatory protein, lipocalin-2 (LCN2/NGAL). LCN2/NGAL is a protein which is normally secreted in very small amounts from various organs, but its expression increases in a number of pathological conditions including ischemic injury, urinary infections and immunological graft rejection.

Aim of the study: To examine the significance of immunohistochemically expression of the neutrophil inflammatory protein, lipocalin-2 (LCN2/NGAL) in renal transplant as well as its correlation with histopathological changes.

Matherials and methods:
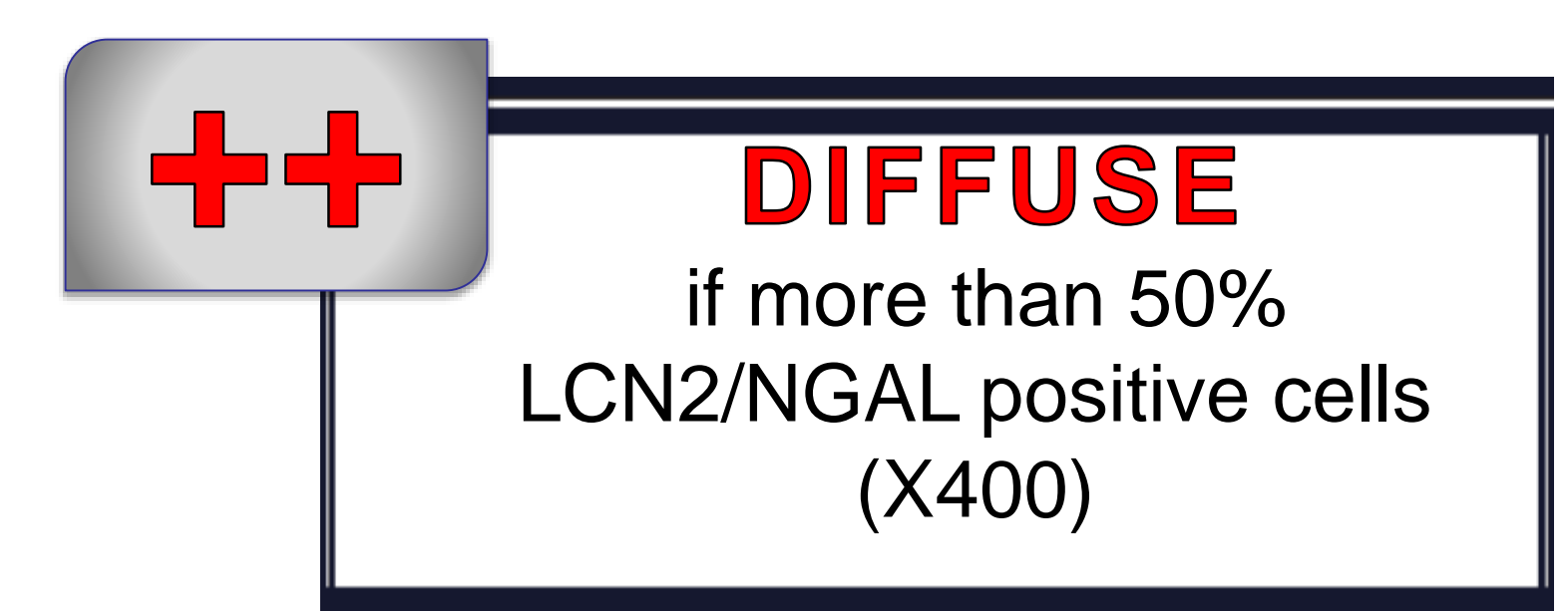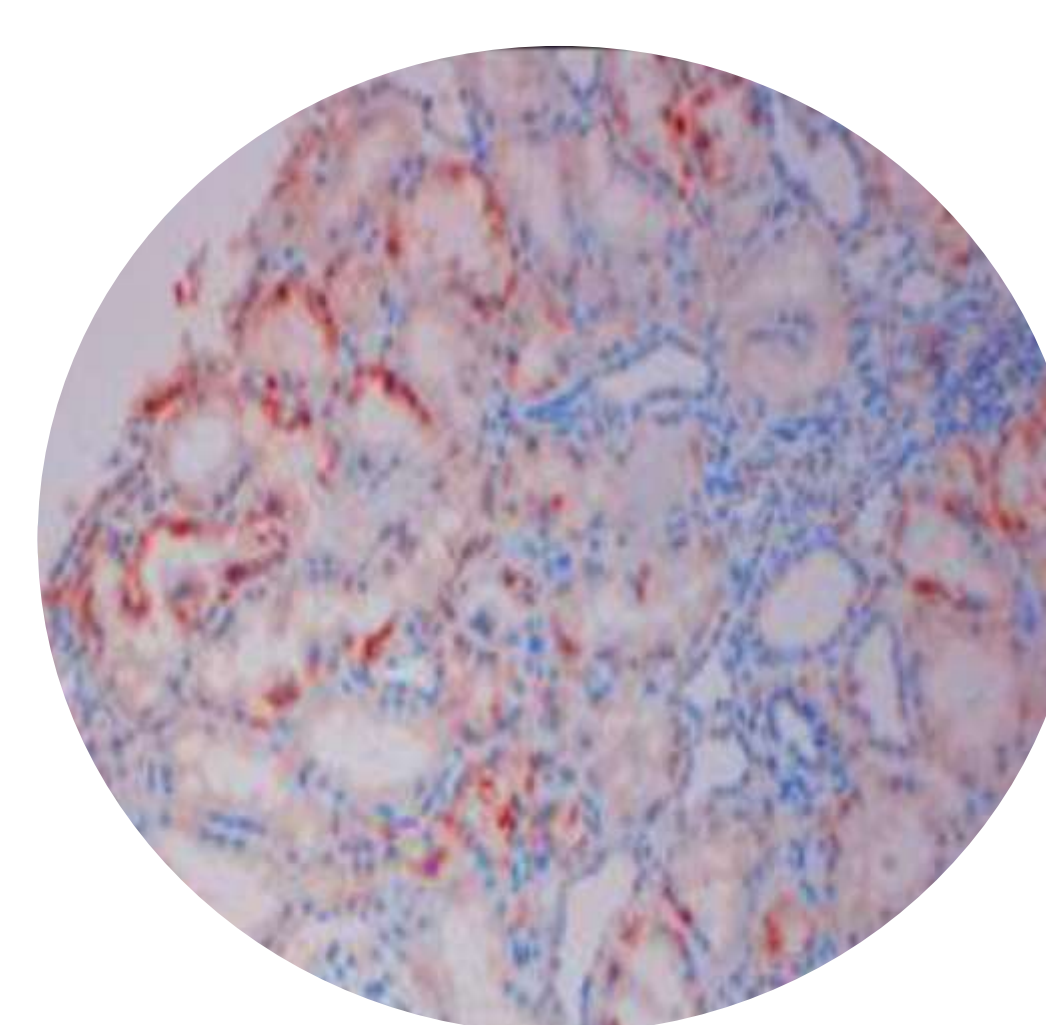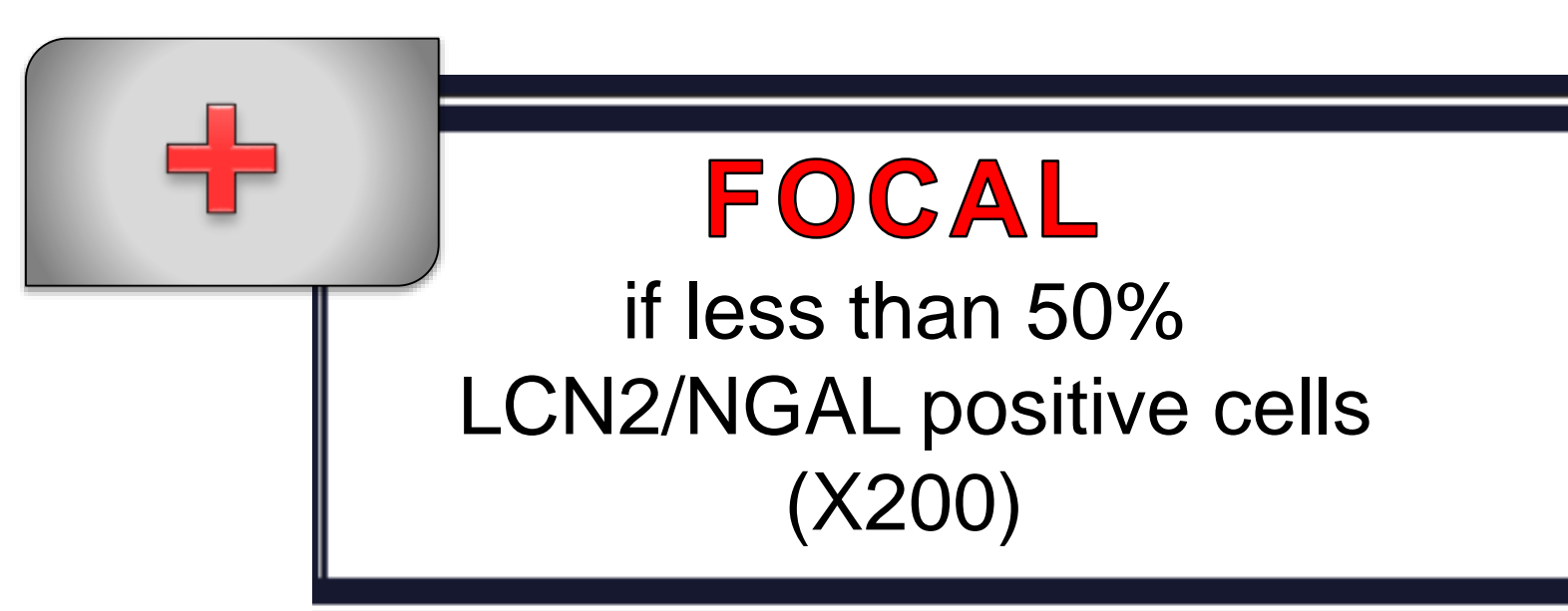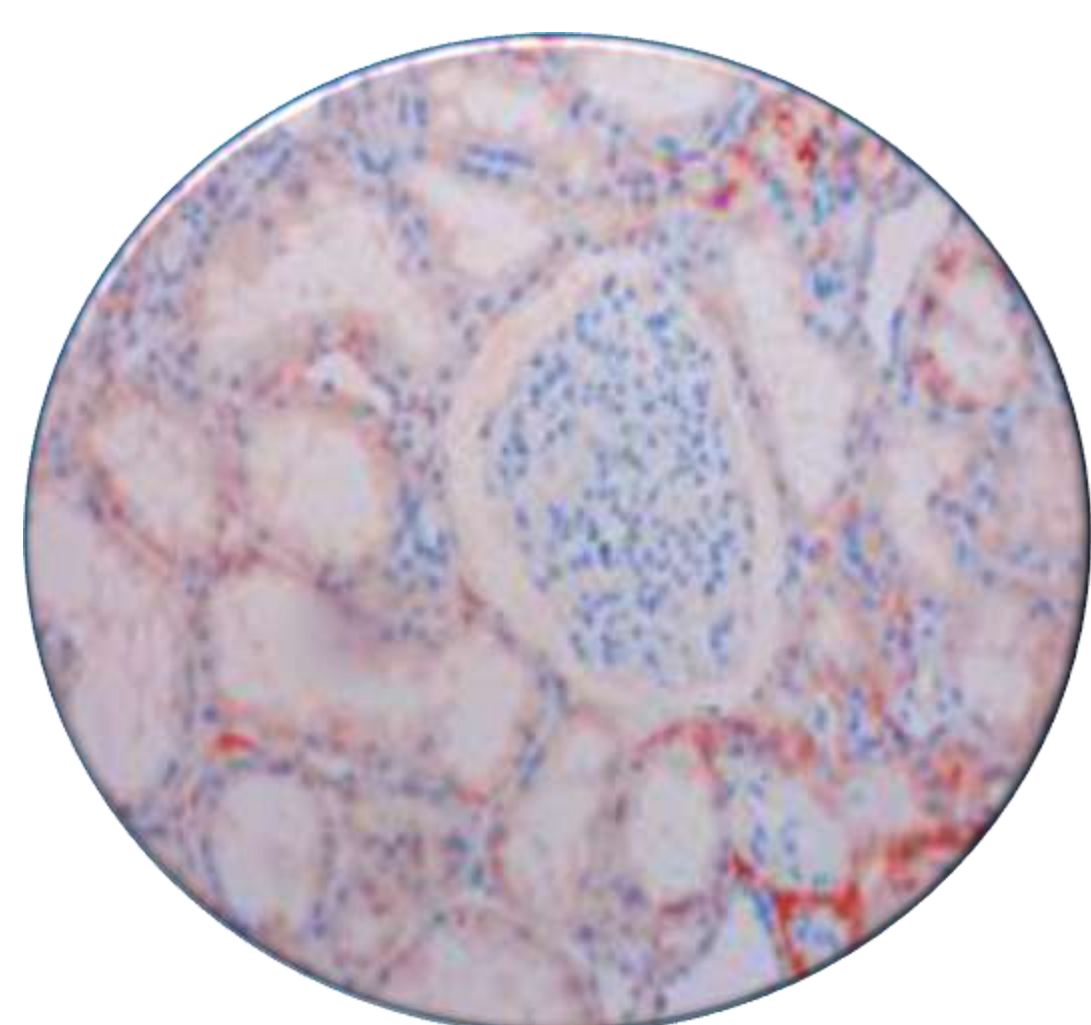
Patients and Tissue Samples:

Archival tissue specimens of kidney obtained from 29 patients treated by kidney transplantation were retrospectively studied. In 17 cases there was an acute rejection, of which all were positive to LCN2/NGAL staining.

Immunohistochemistry with Neutrophil inflammatory protein, lipocalin-2 (LCN2/NGAL) Antibody:

Immunohistochemical staining of archival tissue specimens was performed by the labeled streptavidin–biotin–peroxidase method.
LCN2/NGAL immunoexpression was evaluated as the percentage of cells with positive cytoplasmic staining. Accumulation of LCN2/NGAL was examined in correlation with 4 morphological changes that, according to the BANFF classification, indicate acute rejection: 1. transplant glomerulitis, 2. tubular expression of MHC class II antigen, 3. transplant endarteritis, 4. interstitial cellular rejection.

Semiquantitative scoring was performed:

+ FOCAL
if less than 50%
LCN2/NGAL positive cells
(X200)

++ DIFFUSE
if more than 50%
LCN2/NGAL positive cells
(X400)

Results:

Patient characteristic	Number of patients n (%)
Gender	
Male	22 (75.9%)
Female	7 (24.1%)
Transplantation	
Cadaveric	18 (60.07%)
Living donor	11 (37.93%)

	Score n (%)	
	++	+
LCN2/NGAL expression in kidney transplant biopsy with acute rejection	**9/17 (52.9%)**	**8/17 (47.1%)**
Transplant glomerulitis	5/17 (29.4%)	2/17 (11.8%)
Tubular expression of MHC class II antigen	2/17 (11.8%)	5/17 (29.4%)
Interstitial cellular rejection	0 (0%)	1/17 (5.8%)
Transplant endarteritis	0 (0%)	2/17 (11.8%)

Expression of LCN2/NGAL is in acute rejection samples in corelation to tubular expression of MHC class II antigen and transplant glomerulitis

p<0.01

Conclusion:

In this study we have confirmed that LCN2/NGAL is strongly associated with acute rejection and other forms of acute injury. Tubular MHC class II expression was correlated with LCN2/NGAL accumulation and was accompanied by the presence of transplant glomerulitis. All of this contributes to the idea of its further use in clinical practice.

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