The Value of Urinary Neutrophil Gelatinase-Associated Lipocalin in the Differential Diagnosis of Acute Kidney Injury in Liver Cirrhosis

Thesis

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Abstract:

Introduction of acute kidney injury was mentioned. Types of AKI in liver cirrhosis was listed. Urinary NGAL and its measurement importance was discussed. Concerning diagnostic performance of uNGAL in differentiating the different types of AKI, uNGAL has good diagnostic performance in the differentiation, uNGAL levels were significantly different in each category of AKI: highest in iAKI, intermediate in HRS and low in prerenal disease. Furthermore, uNGAL levels in patients with prenrenal azotemia were similar to those with normal kidney function.

Urinary NGAL has not only potentiality to detect AKI but also has the ability to differentiate cause of AKI as shown in the current study that revealed uNGAL > 30 ng/mg, 15-39 ng/mg, 39-143 ng/mg and >143 ng/mg had the highest characteristics as a diagnostic marker for detecting AKI, diagnosis of prerenal group, HRS and ATN patients respectively.

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List of Abbreviations

Abbr.	Full-term
AKI	**:** Acute kidney injury
AKIN	**:** Acute kidney injury network
ATN	**:** Acute tubular necrosis
CB1	**:** Cannabinoid 1
CKD	**:** Chronic kidney disease
CSPH	**:** Clinically significant portal hypertension
eNOS	**:** Endothelial NO synthase
ET-1	**:** Endothelin-1
FENa	**:** Fractional excretion of sodium
FGF	**:** Fibroblast growth factor
GFR	**:** Glomerular filtration rate
HRS	**:** Hepatorenal syndrome
HSCs	**:** Hepatic stellate cells
HVPG	**:** Hepatic venous pressure gradient
ICA	**:** International club of ascites
KDIGO	**:** Kidney disease improving global outcome
Lcn2	**:** Lipocalin 2
MAP	**:** Mean arterial pressure
MDRD	**:** Modification of Diet in Renal Disease
MELD	**:** Model of end stage liver disease
MMP-9	**:** Matrix metalloproteinase-9

NGAL : Neutrophil-gelatinase-associated lipocalin
NO : Nitric oxide
NSAIDs : Non-steroidal anti-inflammatory drugs
PDGF : Platelet-derived growth factor
PGE : Prostaglandin E
RAAS : Renin-angiotensin-aldosterone system
SARS : Severe acute respiratory syndrome
SBP : Spontaneous bacterial peritonitis
sCr : Serum creatinine
SECs : Sinusoidal endothelial cells
sGC : Soluble guanylyl cyclase
TGF-b1 : Transforming growth factor-beta 1
VEGF : Vascular endothelial growth factor

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Introduction

Physicians caring for patients with cirrhosis should recognize the acute or chronic character of renal disease; the causes of renal injury; the clinical conditions leading concomitantly to acute kidney injury (AKI) and liver dysfunction, and the prognostic factors associated with the progression of AKI. Hypovolemia (due to diuretics, hemorrhage, diarrhea), acute tubular necrosis, sepsis, nephrotoxic agents (such as non steroidal anti-inflammatory drugs, aminoglycosides radiological contrasts) and hepatorenal syndrome-type 1 are the most common causes of AKI in cirrhotic patients ***(Hartleb and Gutkowski, 2012).***

Acute kidney injury (AKI) in patients with cirrhosis is common and deadly. Up to 20% of hospitalized patients with cirrhosis develop AKI and once AKI occurs, there is a reported fourfold increased risk of mortality ***(Du Cheyronet al., 2005).***

In cirrhosis, AKI types include prerenal azotemia, hepatorenal syndrome (HRS), and acute tubular necrosis (ATN) ***(Garcia-Tsao et al., 2008).***

Unfortunately these forms of AKI are difficult to be distinguished clinically as serum creatinine (sCr), the clinical