



Albumin to creatinine ratio in a random urine sample: Correlation with severity of preeclampsia



Fady S. Moiety ^{a,*}, El Sayed El Badawy Mohamed ^{a,1}, Rana El Attar ^{a,1},
Dalal El Kaffash ^{b,1}

^a Department of Obstetrics and Gynecology, Faculty of Medicine, Alexandria University, Egypt

^b Department of Clinical Pathology, Faculty of Medicine, Alexandria University, Egypt

Received 16 July 2013; accepted 31 December 2013

Available online 31 January 2014

KEYWORDS

Albumin;
Creatinine;
Ratio;
Albumin to creatinine ratio;
Preeclampsia

Abstract *Background:* Albumin to creatinine ratio (ACR) in random urine samples correlates well with 24-h protein excretion in potential glomerulopathy as in diabetic renal microangiopathy. Using this ratio as an appropriate screening test for proteinuria or for the disease severity in hypertensive disorders with pregnancy needs still to be verified.

Objective: To investigate the role of albumin to creatinine ratio in a random urine sample for assessment of severity of preeclampsia.

Patients & methods: Two separate groups, fifty women each, were enrolled. All were pregnant at their third trimester with confirmed preeclampsia. Based on their blood pressure levels, Group A, included patients with mild form of preeclampsia, whereas group B included cases with severe form. Albumin to creatinine ratio in random urine samples and the 24-h protein content in urine were assessed.

Results: ACR and the 24-h urine protein excretion were significantly correlated, ($r = 0.583$, $p < 0.001$). Cut-off value for ACR for this group of patients was calculated to be 14.65 mg/mmol, above which severity of the disease is highly probable. The sensitivity and specificity were 100% and 58.0%, respectively. The positive predictive value was 70.4% and negative predictive value was 100%.

Conclusions: Random urine ACR may be a reliable method for prediction and assessment of severity of preeclampsia. Using the estimated cut-off may add to the predictive value of such a simple quick test.

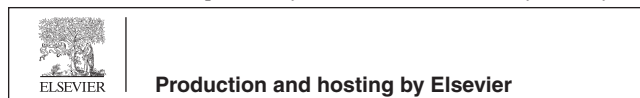
© 2014 Alexandria University Faculty of Medicine. Production and hosting by Elsevier B.V. All rights reserved.

* Corresponding author. Tel.: +20 1001455770; fax: +20 3 5230502.

E-mail address: fmoiety@gmail.com (F.S. Moiety).

¹ Present Address: Shatby Maternity University Hospital, Department of Obstetrics and Gynecology, Shatby, Alexandria 21526, Egypt.

Peer review under responsibility of Alexandria University Faculty of Medicine.



1. Introduction

Hypertensive disorders complicating pregnancy are common and form one of the deadly triad, along with hemorrhage and infection that contribute greatly to maternal morbidity and mortality.^{1,2} Preeclampsia is defined as a pregnancy-specific syndrome of reduced organ perfusion secondary to vasospasm and endothelial activation.^{3–6} Proteinuria is an important sign of preeclampsia, without which, the diagnosis is questionable.^{7,8} Significant proteinuria is defined by 24-h urinary protein exceeding 300 mg or persistent 30 mg/dl in random urine samples. The degree of proteinuria may fluctuate widely over any 24-h period, even in severe cases. Therefore a single random sample may fail to demonstrate significant proteinuria.^{9,10}

Severe preeclampsia may be diagnosed clinically by persistent diastolic hypertension at or above 110 mm Hg, marked headache, visual symptoms, oliguria or right upper quadrant pain. Persistent proteinuria and abnormal liver or renal function tests are all signs of disease severity as well.¹¹

The measurement of protein excretion in a 24-h urine collection is used as the gold standard for the diagnosis and follow-up of pathologic urinary excretion.¹² However, 24-h urine collection is time consuming, inconvenient and often inaccurate especially during pregnancy with less patient's compliance.

It is of utmost importance to highlight new diagnostic or predictive reliable tests, and hence introduce and apply them in a population with still fairly high maternal mortality rate, such as the Egyptian population. Many suggestions of predictors of severity of preeclampsia in the Egyptian population have been published, such as blood lead level,¹³ genetic mutation in Endothelial nitric oxide synthase (eNOS) (Glu298Asp) or uterine II (UTS2 S89N) gene polymorphisms,¹⁴ and maternal serum leptin.¹⁵

In this study we studied a random urine albumin to creatinine ratio as a simple quick test to predict the presence of significant proteinuria and to assess severity of preeclampsia in Egyptian patients.

2. Patients and methods

One hundred pregnant women attending the Antenatal clinic of our University hospital were enrolled. All women were primigravidae, at or above 28 weeks of gestation and with confirmed diagnosis of preeclampsia. Based on their blood pressure levels, and after a full informed consent was signed, women were recruited into two separate equal groups (50 women each); group A, consisted of patients with mild form of preeclampsia (diastolic blood pressure less than 110 mm Hg^{3,4}) and Group B consisted of patients with severe form (diastolic blood pressure at or above 110 mm Hg^{3,4}). Patients with chronic hypertension, diabetes mellitus, preexisting renal or vascular disease or urinary tract infection were excluded. The study was formally approved by the Ethical Committee of the Faculty of Medicine, Alexandria University with the following ID:[IRB No. 00006555, FWA No. 00011712, May 2008]. Microalbumin in urine was tested by NycoCard Microalbumin Single Test (Axis-Shield® plc, Oslo, Norway) based upon an immunometric flow-through principle. Quantitative determination of both creatinine and albumin in urine sample was done by Roche/Hitachi 902 analyzer (Roche Diagnostics®, Basel, Switzerland).^{16,17}

The statistical analysis of the data obtained in the present study was carried out using the Statistical Packages for the Social Sciences (SPSS version 15.0, Chicago, IL). Normally distributed data were presented as mean, standard deviation, whereas skewed data were expressed as median and range. Pearson coefficient of correlation was used to find the correlation between two parameters in the same group. ROC curve was plotted to find the diagnostic performance of the variables.

3. Results

The mean values of albumin (mg/L), creatinine (mmol/L), ACR in a random urine sample, and 24-h protein in urine (mg/24-h) in both groups are shown in Table 1. Significant statistical differences were found between both studied groups regarding albumin in random urine sample, ACR, and 24-h

Table 1 Albumin, creatinine, ACR and protein in urine.

	Group A (Mild) <i>n</i> = 50	Group B (Severe) <i>n</i> = 50	Z (<i>p</i>)
<i>Albumin (mg/L)</i>			
Range	1.19–6500.00	34.40–29500.00	6.613* (<0.001)
Mean ± SD	717.99 ± 1273.03	3976.97 ± 5580.22	
Median	20.80	2650.00	
<i>Creatinine (mmol/L)</i>			
Range	0.32–18.64	0.60–39.91	1.896 (0.058)
Mean ± SD	5.53 ± 4.76	8.24 ± 7.86	
Median	3.97	5.54	
<i>ACR (mg/mmol)</i>			
Range	0.31–980.39	14.85–2673.48	6.225* (<0.001)
Mean ± SD	140.36 ± 232.59	631.62 ± 530.60	
Median	4.59	533.67	
<i>Protein (mg/24-h)</i>			
Range	390.00–4410.00	14.85–11850.00	6.894* (<0.001)
Mean ± SD	1285.60 ± 945.14	7066.08 ± 2795.22	
Median	887.50	7565.00	

Z: Z for Mann Whitney test.

* Statistically significant at $p \leq 0.05$.

Download English Version:

<https://daneshyari.com/en/article/3431658>

Download Persian Version:

<https://daneshyari.com/article/3431658>

[Daneshyari.com](https://daneshyari.com)