

## Twenty-four hours Urine Protein Versus Single Voiding Urine Protein in Karbala City.

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### Abstract

**Background** The gathering of urine for 24hrs for total protein was nominal and long test procedure and consider as ideal way .It was not free of alert ,to alternate this 24 hrs collection procedure, the physician work in new way of one voided spot urine protein to creatinine ratio correlate to 24hr urine protein excretion. **Patient and method** Sixty- six patients taken from outpatient clinic in nephrology unit of Imam AL Hussein Medical city .Thirty-seven of patients were male and 29 of patient were females ,patients with systemic lupus erthromatosis ,diabetes mellitus ,urinary track infection and pregnancy were exclude. Patients dividing into 5 groups according to glomerular filtration rate , urine and serum Creatinine was calculated. The result of 24hr proteinuria and Up/C ratio calculated to patients and according to glomerular filtration rate the result obtain to each groups. **Result** The correlation between urine protein to creatinine ratio and 24hr urinary protein excretion at the different level of glomerular filtration rate were calculated and find significant correlation (1.94 to 2.04) in all five groups with P value <0.05 significant. **Conclusion** From this study found that single voiding protein to creatinine ratio was an alternative to 24hr to asses protein urea at all stage of glomerular filtration rate .

### الخلاصة :

أحد فحوصات وظائف الكلى هو عن طريق تحليل جمع الادرار خلال 24 ساعة ثم حساب كمية البروتين فيه .وتعتبر هذه الطريقة طويلة ومملة للمريض وهناك تحليل اخر اسرع وأسهل ويكون بأخذ عينة واحدة من ادرار المريض وحساب النسبة بين تركيز البروتين الى تركيز الكرياتينين في تلك العينة . وقمنا بهذا البحث لقياس مدى كفاءة التحليل الثاني بالنسبة للتحليل الاول . حيث تم أخذ عينات من 66 مريض ( 37 ذكر و 29 أنثى) راجعوا مدينة الامام الحسين (ع) الطبية في كربلاء . وكانوا يعانون من امراض مختلفة ولديهم خلل في عمل الكليتين بنسب متفاوتة ( تم تقسيمهم الى 5 اقسام) وكانت النتيجة كالاتي : أن تحليل العينة الواحدة من الادرار هي بديل جيد ومعتبر من الناحية الاحصائية بالمقارنة مع تحليل ال 24 ساعة ولمختلف مراحل شدة ضرر عمل الكليتين .

المفاتيح : عجز الكلى , كمية البروتين في الادرار , تركيز الكرياتينين , تحليل عمل الكليتين .

### Introduction

We consider the proteinuria is a most useful marker to asses renal disease , early diagnosis and detection was aclue to decrease progresses of a disease to irreversible stage ( 1 )

Secretion of protein in the urine variable with stressful condition, work, body fluid status and position of the body ( 2 ),quantative calculation 24hr protein was the most important one with some problem like difficulty to complete collection ,bacterial over growth ,real time difficulty and incomplete bladder empty. As Creatinine excretion was fix and vary with hydration status. With spot urine protein Creatinine ratio there was no effect of hydration on protein calculation ( 3 ),it was easy and can done at any time of day and some search prefer morning sample ( 4).

The single voiding urine protein to creatinine ratio use in state of 24hr urine collection was done first in 1980 ( 5 )there after several article had be presented in this subject some of this were raised including the variable affecting the result , low muscle mass may over estimated ( 6 ) and the time of single voiding urine protein still subject on discussion . Urine protein to creatinine ratio may vary with ethnicity and race too( 7 ),in general variability is not significant clinically. At low GFR there was over estimated, normal urine protein excretion was 150mg /24hr .Protein urea subgroup according to amount of protein to nephrotic and non nephrotic rang or according to site either glomerular versus non glomerular. Protein urea classified as tubular, over flow and glomerular,24hr urine protein excretion , There are multiple studies which consider that the spot urine was used in spite of 24hr for asses protein in urine ( 8 ).

Tubular proteinuria presented in disease occurring the tubulointerstitial component of kidney with amount less than 2gram ,overflow proteinuria occurring with elevated abnormal low molecular weight protein that exceed the reabsorption capacity of tubules while glomerular proteinuria may be transient ,orthostatic, sub nephrotic or nephrotic rang proteinuria which more than 3.5 gram in 24hr ( 6 ).

### **Aetiology**

- 1.Systemic disease with loosed of the kidney capacity to normally reabsorb the protein.
2. A destruction glomerular barrier give chance to middle size molecule to enter the bowman space.
3. Increase of plasma protein that were able to pass through the normal (glomerular basement membrane )

Proteinuria consider as risk factor for development of cardiovascular and kidney problem, the 24hrs collection some time had over collection so carry error and in children difficult to preform because of uncooperative and it takes a prolong time ( 5 )

## **Patient and method**

### **Patient consideration**

Sixty-six of patients were taken from nephrology unit of Imam AL Hussein Medical city in out patients clinic.

Thirty-sevens of patients were males 56% age rang(40-65 years ),29 of Patients were females 43% age range (43-60 years ).

### **Inclusions criteria**

- Patients with proteinuria on dipstick random urine samples.
- Middle age patients to young old.

### **Exclusion criteria.**

- Age <20years and >70years
- Patients with SLE.
- Inadequate urine sample.
- Pregnancy.
- Renal transplant.
- Preeclampsia patients

## **Method**

Patients with proteinuria by random dipstick were include in this study any group in to 5 groups according to GFR.

- 1- >90 ML/Min
- 2-60-90 ML/Min
- 3-30-59 ML/Min
- 4-15-29 ML/Min
- 5-<15 ML/Min

Three ml of urine sample was took for dipstick test and three ml for protein Creatinine ratio.

Instructed the patients to collected urine for 24hr in dry clean container (5ML 10 NHCL) was added to container keep in cold weather .

Sample for urine protein to creatinine ratio took either after or before 24hr collection sample.

Three ml of blood aspirated from patients for serum Creatinine to calculate GFR according.

$GFR = \text{Urine Creatinine} \times \text{Urine volume} / \text{serum Creatinine} \times 1440.$

The urine and serum Creatinine were determined by the jaffe kinetic method (Kit from biosystem company) [5].

Statistical analysis in study was analysed by EXCEL program P value <0.05 significant .

## **Result**

From this study find there are correlation between 24hr urine protein collection and single urine voiding protein(1.94,2.04) at all stages of chronic renal failure from 66 patients with p value <0.05 statistically significant , urine protein to creatinine ratio in random urine sample and 24 hr urine sample where calculated by divided protein g/dl by Creatinine mg/dl.

Numb er	GFR rate ml/mi n	Numb er of patient s	Numb er of female patient s	Numb er of male patient s	24 hr proteinur ia g/24h	PCR, single voidin g urine	Dipstic k test
1	>90	13	6	7	0.75	0.68	+
2	60-89	16	8	8	0.93	0.90	+
3	30-59	18	6	12	3.1	3.5	+++
4	15-29	10	5	5	2.0	2.5	++
5	<15	9	4	5	2.7	2.6	++
Total		66	29	37	1.94	2.04	++

Table show correlation between 24 hr urine protein and single voiding protein in all five stages of chronic renal failure with p value <0.05 statistically significant.

## Discussion

The gold standard method was quantitative measurement of protein in the urine collected over 24hr .However, this method was need long time at this day to do ,inopportune and prone to in proper collection of urine( 10 ).Measuring the Up/c ratio is simple, rapid and more accurate than time collection ( 11 ).The National kidney foundation suggested that spot urine sample should be used to detect proteinuria in children and adult ( 12 ).

In this study with 66 patients, we find good correlation between spot urine p/c ratio and 24hr urine protein excretion over good range of proteinuria from0.68 to 3.5 g/day more than 90% had proteinuria <3g/day ,the correlation was significant statistically p value <0.05 these study agreement with other studies elsewhere ( 12 ).

It was difficult to whom work at this field to understand that we would believe only on division of protein in a urine sample by the result of Creatinine in the same sample, this ,rapid, accurate formula with the pass of years become the best to do and most lab do now because facility ,reliability and diagnostic speed and the physician found solution for children and elderly patients and those who disabled. ( 13 ) The proper asking was whether some diseases need 24hour urine protein collection and the

other need single voiding urine protein this need more study to said where should prefer one to another .( 14 )

## **Conclusion**

Protein Creatinine had good accuracy ,convenient and reliable method compared with 24hr collection of urine for proteinuria.

urine protein to creatinine ratio was simple test ,reflect change in proteinuria over time also used to asses response to treatment and sequel on fallow up.

## **Limitation of study**

- 1.single centre
- 2.incomplete collection on 24hr proteinuria.

## **Recommendations**

Do correlation between 24hr proteinuria and urine protein to creatinine ratio for nephrotic syndrome patients to determined therapeutic response.

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