# SHORT COMMUNICATION LETTER

## ROLE OF SERUM CREATININE FOR SCREENING RENAL DISEASES

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## INTRODUCTION

Chronic kidney disease (CKD) is a public health problem with increasing prevalence in Pakistan.[1,2] Early identification of mild renal disease can delay its progression.[3] Glomerular filtration rate (GFR) is the best overall index of renal function, but it is difficult to measure, so mostly clinicians rely on serum creatinine (SCr) concentration which its own limitations. On the other hand 24 hours (h) urinary creatinine clearance (CrCl) is a more sensitive marker of renal dysfunction.[4,5]

Presently SCr is being used in our clinical practice to screen the renal diseases which can miss mild renal dysfunctions, so this study was designed to calculate frequency of individuals having reduced GFR as determined by CrCl having normal SCr levels.

## PATIENTS AND METHODS

A cross sectional comparative study was carried out at Department of Chemical Pathology and Endocrinology, Armed Forces Institute of pathology, Rawalpindi from 1st Jan 2008 to 31th Dec 2008. A total of 1196 individuals were enrolled in the study by non-probability convenience sampling that had age > 18 years irrespective of sex. Urine sample for 24 h and blood was collected from the individuals for creatinine estimation (umol/l) by Jaffe kinetic method on automated chemistry analyzer Selectra-2. CrCl was calculated by the following formula;

CrCl(ml/min) = Urinary creatinine x Urinary volume

Serum creatinine x Time in minutes

Cases were divided into 2 groups. Group I (967) cases whose SCr was deranged, Group II (449) cases that had SCr levels within reference values.

Statistical analysis of data was done by using statistical program for social sciences version 11.0. Descriptive statistics were carried out to summarize the data. Mean+SD was calculated for age, gender, SCr and CrCl. Frequency and percentage was calculated for SCr and CrCl.

## RESULTS

Among 1196 individuals, 760 were male and 436 female and their mean ages were 60 & 53.5 years respectively. Group I had deranged SCr (mean+SD 370+135 umol/l) and CrCl (mean+SD was 30+13 ml/min). Whereas in Group II, 205 cases (45 %) with normal SCr level had reduced CrCl, (mean+SD 58+14 & 45+11 ml/min) for males and females respectively; whereas 244 (55%) cases had CrCl values within their reference values (Table 1).

## DISCUSSION

In Group 1, SCr was deranged; mean±SD (370±135 umol/l) and their CrCl (mean±SD was 30±13 ml/min) was reduced accordingly, which shows that SCr performs well at higher serum concentrations. In GroupII 205 cases (45 %) of with normal range SCr; had reduced GFR, mean±SD (58±14 & 45±11 ml/min) for males and females respectively which is in accordance with previous studies[6-8]. This decreased GFR was attributable to decreased urinary creatinine excretion and decreased urinary volume which shows lack of compliance, more common among females.[9]

The limitation of this study is that it lacks the comparison of SCr with gold standard test of GFR and further studies for calculations of GFR using MDRD/ Cockcroft- Gault / Schwartz formulae may be conducted in our population in order to minimize the bias in results.

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**Table 1. Results of serum creatinine and creatinine clearance (N=1196)**

| Group | n | M | F | SCr (umol/l) mean±SD | | CrCl (ml/min) mean±SD | |
|---|---|---|---|---|---|---|---|
| | | | | M | F | | |
| I | 747 | 456 | 291 | 370/135 | | 30±13 | |
| II | 449 | 291 | 158 | 88±10 | 80±9 | 244 Cases within range | |
| | | | | | | 205 Cases | |
| | | | | | | M | F |
| | | | | | | 58±14 | 45±11 |

## CONCLUSION

SCr is a less reliable marker for screening renal diseases as compared to GFR estimation by creatinine clearance.

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