ORIGINAL RESEARCH

Analysis of renal profile in geriatric population

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ABSTRACT

Background: The present study was conducted for assessing renal profile in geriatric population. **Materials & methods:** One hundred geriatric subjects of more than sixty years of age and 50 healthy controls were enrolled. Complete demographic and clinical details of all the subjects was obtained. A Performa was made and findings of clinical evaluation was recorded. Blood samples were obtained and renal profile was evaluated in all the patients. All the results were recorded and were analysed using SPSS software. **Results:** Mean BUN levels among geriatric subjects and controls were 24.8 mg/dL and 13.1 mg/dL respectively. Mean serum creatinine levels among geriatric subjects and controls were 1.62 mg/dL and 0.98 mg/dL respectively. Significant results were obtained while comparing the renal profile among the geriatric subjects and healthy controls. Renal dysfunction was seen in 28 percent of the subjects of geriatric age group. **Conclusion:** The aging process of the renal system itself and various related comorbidities determine how the renal profile changes with age.

Key words: Renal, Geriatric

INTRODUCTION

Since the 1950s the median age of the US population increased by 20 years. Increased life expectancy reflects, in part, a better understanding of the disease states, newer interventions, and the success of public health programs. The number of persons aged 65 and over is projected to increase from 35 million in 2000 to an estimated 71 million in 2030, with the largest increase in individuals age 80 and above. Differentiating a disease state from "normal" aging is vital when encountering this population in the clinical setting. Respiratory system undergoes various structural, physiological, and immunological changes with age. There is a large variation in different physiologic measures among older adults, making it difficult to construct "normal" limits to differentiate a disease from a normal state.[1- 3]Age-associated loss of GFR critically depends on comorbid conditions such as hypertension and diabetes. Because the measurement of serum creatinine is notoriously unreliable as an indicator of GFR in elderly patients, more reliable GFR estimates should be employed whenever indicated, for example timed creatinine clearance, estimated GFR using a serum creatinine-based formula or serum cystatin C.[4, 5]Hence; the present study was conducted for assessing renal profile in geriatric population.

MATERIALS & METHODS

The present study was conducted for evaluating the renal profile in geriatric patients.One hundred geriatric subjects of more than sixty years of age and 50 healthy controls were enrolled. Complete demographic and clinical details of all the subjects was obtained. A Performa was made and findings of clinical evaluation was recorded. Blood samples were obtained and renal profile was evaluated in all the patients. All the results were recorded and were analysed using SPSS software. Chi-square test and student t test were used for evaluation of level of significance.

RESULTS

Mean age of the subjects of geriatric group and control group was 65.8 years and 39.4 years respectively. Mean BUN levels among geriatric subjects and controls were 24.8 mg/dL and 13.1 mg/dL respectively. Mean serum creatinine levels among geriatric subjects and controls were 1.62 mg/dL and 0.98 mg/dL respectively. Significant results were obtained while comparing the renal profile among the geriatric subjects and healthy controls. Renal dysfunction was seen in 28 percent of the subjects of geriatric age group.

Table 1: Comparison of renal profile

Renal profile	Geriatric subjects	Controls	p- value
BUN (mg/dL)	24.8	13.1	0.002 (Significant)
Serum creatine (mg/dL)	1.59	0.84	0.010 (Significant)

Table 2: Incidence of renal dysfunction of geriatric subjects

Renal dysfunction	Number	Percentage
Present	14	28
Absent	36	72
Total	50	100

DISCUSSION

The progressive decline of renal function with aging is not inevitable, because it is mainly due to comorbid conditions such as hypertension and diabetes. However, in the elderly there is a high prevalence of chronic kidney disease leading to the need for strategies to control cardiovascular risk - death being far more common than dialysis at all stages of kidney function. Serum creatinine, the most widely used surrogate marker of glomerular filtration rate (GFR), is inaccurate with increasing age, particularly in sick and/or malnourished elderly people; it shows the so-called creatinine blind area, and substantial variation between laboratory analytical methods. An alternative endogenous marker is serum cystatin C: it correlates better with renal function and has the potential advantage of improved precision of the assay, but its measurement is still much more expensive.[6- 9]

Mean BUN levels among geriatric subjects and controls were 24.8 mg/dL and 13.1 mg/dL respectively. Mean serum creatinine levels among geriatric subjects and controls were 1.62 mg/dL and 0.98 mg/dL respectively. Significant results were obtained while comparing the renal profile among the geriatric subjects and healthy controls. Renal dysfunction was seen in 28 percent of the subjects of geriatric age group.In a previous review conducted by Fliser D et al, authors summarized the currently used methods for assessment of glomerular filtration rate and their utility in elderly people.Serum creatinine is an unreliable indicator of glomerular filtration rate in elderly people, particularly in those who are sick or malnourished or both. Thus, more reliable glomerular filtration rate estimates should be employed whenever indicated, for example, timed creatinine clearance, serum creatinine-based equations such as the Modification of Diet in Renal Disease formula, or serum cystatin C. However, no single method may be satisfactory.Accurate assessment of renal function is a prerequisite for the correct management of elderly people at risk of developing chronic kidney disease; for example, those with diabetes, hypertension, and other clinical conditions that may considerably accelerate an age-related decrease in glomerular filtration rate.[10]In 1999, Levey et al. published their formula based on a large study, the MDRD Study Group. Renal function can be estimated based on serum creatinine concentration and age. Since then, many studies have compared the CG and MDRD formulas and with other equations, both with and without reference to a gold standard.[11, 12]

Fliser D et alperformed a comprehensive study to compare several aspects of renal function in four groups: (i) young healthy normotensive subjects (N = 24; 13 males; mean age 26 ± 3 years); (ii) elderly healthy normotensive subjects (elderly NT; N = 29; 13 males; 68 ± 7 years); (iii) elderly treated and untreated hypertensive patients (elderly HT; N = 25; 13 males; 70 ± 6 years); and (iv) elderly patients with compensated mild to moderate heart failure (elderly HF; N = 14; 6 males; 69 ± 6 years). Compared to young subjects mean GFR (CIn) and ERPF (CPAH) were significantly lower in the elderly, despite similar mean plasma creatinine levels (young, 121 ±11, 650 ± 85 ml/min/1.73 m2; elderly NT, 103 ± 11, 486 ± 102; elderly HT, 103 ± 13, 427 ± 55; elderly HF, 92 ± 14, 377 ± 103). Nevertheless, GFR was within the normal range in the majority of elderly NT and HT, but not in elderly HF. ERPF was significantly lower in elderly HT as compared with elderly NT, and still lower in elderly HF. Mean renovascular resistance and filtration fraction were significantly higher in the elderly, particularly in elderly HT and HF as compared with the young. Mean fractional excretion of Na+ was similar in all groups studied, but the lithium clearance was significantly lower in the elderly, suggesting a greater proximal and less distal sodium reabsorption in senescence.[13]

CONCLUSION

The aging process of the renal system itself and various related comorbidities determine how the renal profile changes with age.

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