

ORIGINAL RESEARCH ARTICLE

Prevalence of Renal Disease Based on Renal Function Test in Patients Attending OPD of Chitwan Medical College Teaching Hospital

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Received 12 Oct 2012; Revised 23 Jan 2013; Accepted 05 Feb 2013

ABSTRACT

Information on the prevalence of renal disease in the inhabitants of Chitwan is still very scanty. Renal function tests were used to determine the prevalence (presence or absence) of renal disease in all age group populations. Renal functions were assessed in 5990 patients attending OPD of Chitwan Medical College Teaching Hospital, a tertiary care teaching hospital in the eastern region of Nepal. Renal function tests were performed using serum levels of total protein, albumin, sodium, potassium, urea, and creatinine as indicators of renal function. Out of 5990 subjects, 90 patients (1.50%) were selectively diagnosed as renal disease and another 90 subjects has been included in the study those are normal individuals. The serum concentrations of all the parameters of renal function test in patients were significantly higher ($p < 0.003$) than those of normal individuals except total protein and albumin which was significantly lower in experimental group than the control group. Therefore, from the trend of our data, we can conclude that renal dysfunction is a very common feature in the population of Chitwan.

Key words: Prevalence, kidney disease and renal function test.

INTRODUCTION

Kidney performs many important functions to regulate the internal environment of the body. It is the main regulator of all the substances of body fluids and responsible for maintaining homeostasis. Acute Renal Failure (ARF) is defined as rapid (over hours to weeks) and usually at least partially reversible decline in glomerular filtration rate (GFR) that may occur either in the setting of preexisting normal renal function (classic ARF) or in someone with preexisting renal disease (acute or chronic renal failure)^[1]. ARF is associated with significant morbidity and mortality^[2]. There are few reports from Nepal on both Chronic Kidney diseases (CKD)^[3, 4] and ARF^[5, 6]. Major bulk of ARF patients are being handled by internist in Nepal due to the limited number of Nephrologists and Nephrology centers.

Simple renal function tests using blood samples are widely available as part of routine health examination, providing opportunities for physicians to find out abnormalities in renal

function test results in daily clinical practice. Many cases of renal disease are now identified in individuals incidentally found to have abnormal renal function tests as part of routine automated laboratory testing. Abnormal renal function tests cannot be ignored because a subgroup of these patients will have progressive and potentially life-threatening renal disease for which therapeutic interventions are often available. Even in an asymptomatic individual a careful history may identify potential causes of abnormal renal function tests^[1]. The causes of renal disease are many and range from the common to the rare. The most common causes encountered in Southeast Asian region are; diabetes, high blood pressure, poisons, certain drugs, and cancer^[6]. Geo-cultural factors influence the prevalence of renal disease of public health importance in any country. Renal disease may vary from country to country and in the same country in different cultural groups and at different periods of time^[7].

The age adjusted death rate is 14.25/ lakh of population ranks Nepal 105 in the world [7]. Till date detail study on the prevalence of renal disease in and around the population of Chitwan of eastern Nepal is scanty. Keeping in view the above facts, the present study was undertaken to assess the prevalence of renal disease based on renal function tests in the populations of Chitwan who attended the OPD of Chitwan Medical College Teaching Hospital.

MATERIALS AND METHODS

This retrospective study was carried out at the OPD of Chitwan Medical College, Bharatpur, Nepal from the period of February 2011 to March 2012. A total of 5990 subjects were surveyed for this study. Out of 5990 subjects, 90 patients were selectively diagnosed as renal disease which constitutes the “experimental group”. The same number of subjects (90) has included in the study those are normal individuals constitute the “control group”. All the subjects selected in the present study were inhabitants of Chitwan and its surroundings. Most of the subjects of this study were from low socioeconomic families. The mean age of all subjects were found to be 50.08 ± 15.11 years. All historical information's were obtained by interview and medical records. Records with incomplete information were excluded from the study. The subjects with acute illness at the time of the study were also excluded. Permission from the institution and the informed consent of the subjects were obtained for the study.

Methods:

A case of renal disease is diagnosed with a history of significant physical signs and supportive laboratory data of renal function tests. Abnormalities in renal function tests are increased or decreased levels of static biochemical tests, including serum total protein, serum albumin, serum sodium, serum potassium, serum urea, and serum creatinine. The tests are most frequently obtained as part of renal function test panels.

Serum level of protein was determined according to the conventional Biuret method [8]. The concentration of sodium and potassium were determined by spectrophotometric and turbidimetric methods [9]. Serum urea was determined according to the method of Diacetyl Monoxime Method (DAM) [10] and serum creatinine was determined according to the Jaffe's method [11].

Statistical Analysis:

The statistical software SPSS (version 17) was used for data analysis. The mean values of all the parameters of renal function tests were analyzed. Data were expressed as mean \pm SD. Unpaired student's t-test was used for group wise comparisons and p-value of <0.05 was considered statistically significant.

RESULTS AND DISCUSSION

Our retrospective study indicates that renal disease should be considered as a major health problem in Chitwan of eastern Nepal. A total of 5990 subjects were surveyed for this study and finally, out of 5990 subjects, 90 patients (1.50%) were selectively diagnosed as renal disease. When diagnosing patients with renal disorders, it is important to employ appropriate history taking and physical examination to narrow down the differential diagnoses that are suggested by patterns of abnormal renal functions and to accurately determine the causative diseases on the basis of blood tests findings.

Impairment of renal function was assessed by measurement of serum concentrations of protein, sodium, potassium, urea and creatinine. Abnormalities in renal function tests are increased or decreased levels of static biochemical tests, including sodium, potassium, urea, creatinine, total protein and albumin. The tests are most frequently obtained as part of renal function tests panels. In our study, we investigated all the parameters of renal function tests and the results of renal function parameters i.e. sodium, potassium, urea and creatinine are significantly elevated in the experimental group than the control group (Table 2) which is in accord with the earlier report that all parameters of renal functions are elevated during renal dysfunction.

Additionally, based on the history and duration of renal function abnormality, acuteness and chronicity should be determined. But this article does not include a working classification of renal disease, a list of renal functions with the tests appropriate to each function, and a guide to panel interpretation for each laboratory investigation is required and for that further detailed study is required.

In conclusion, we can say that renal function tests are used to detect, specifically diagnose, and estimate the severity of renal disease. This article has given emphasis on the prevalence of renal disease in the population of Chitwan but not in

effective interpretation of the renal function panel which requires knowledge of underlying pathophysiology and the characteristics of panel tests.

Table 1: Serum levels of total protein and albumin of control and experimental group

Parameters	Control	Experimental	P- value
Total protein (gm/dl)	7.15 ± 0.83	5.45 ± 0.77	0.003
Albumin (gm/dl)	4.82 ± 0.69	3.91 ± 0.51	0.001

Values are expressed as mean ± SD (n= 90).

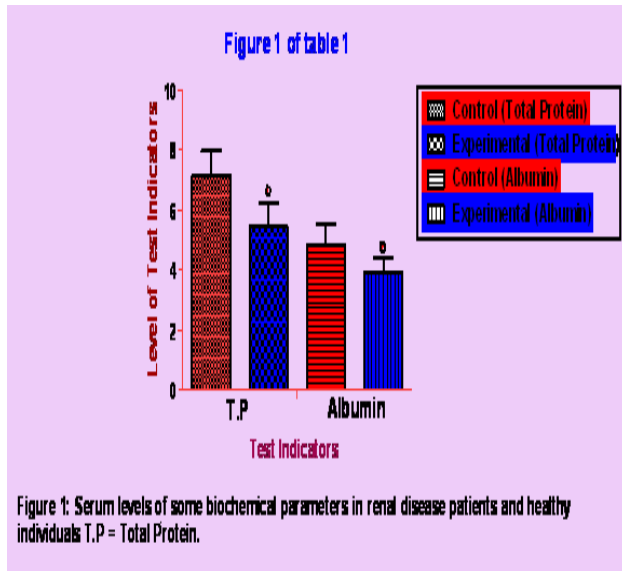
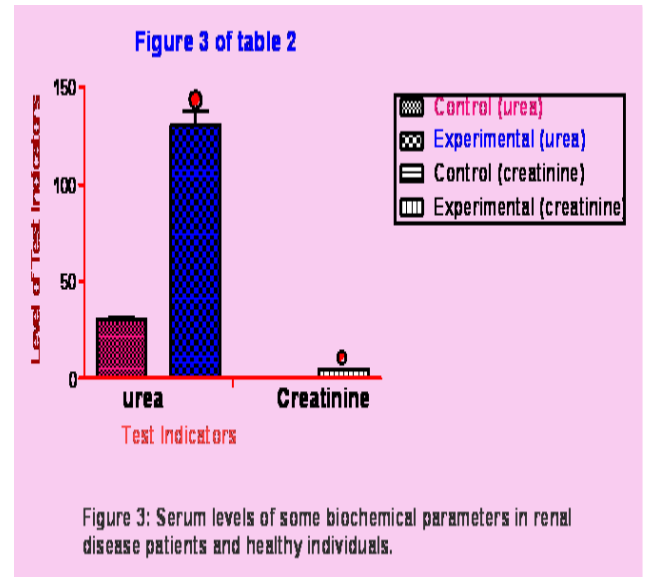
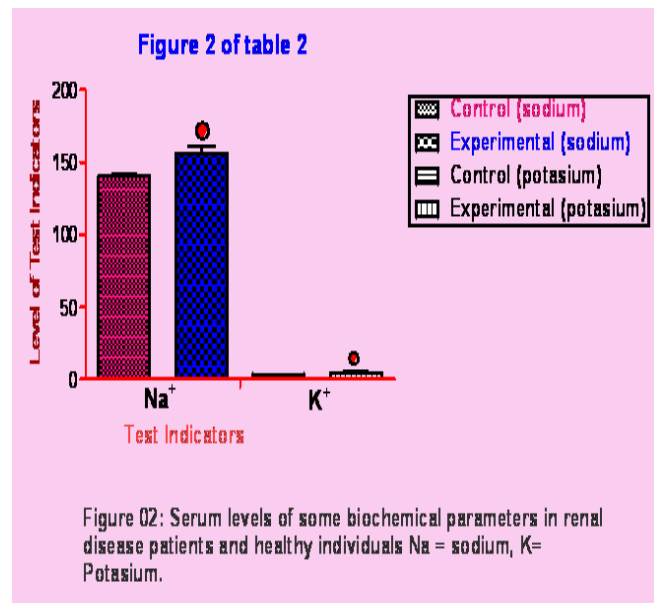


Table 2: Serum levels of sodium, potassium, urea, and creatinine of control and experimental group

Parameters	Control	Experimental	P- value
Sodium (mEq/l)	140.55 ± 0.84	156.28 ± 5.27	0.000
Potassium (mEq/l)	3.73 ± 0.10	4.65 ± 0.35	0.000
Urea (mg/dl)	30.16 ± 1.49	130.80 ± 6.93	0.000
Creatinine (mg/dl)	0.71 ± 0.05	4.70 ± 0.24	0.000

Values are expressed as mean ± SD (n= 90).



ACKNOWLEDGEMENT

The authors would like to thank Chitwan Medical College for providing research facilities. Authors are also indebted to all participants in this study for their cooperation.

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