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Prevalence & nutritional status of metabolic syndrome associated chronic renal failure patients in Allahabad district

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Abstract
Chronic renal failure (CRF) is characterized by progressive deterioration of kidney function, which develops eventually into an End stage of chronic renal failure (CKF). It is a negative consequence of metabolic syndrome. The present study was conducted in Military Hospital and Nazareth Hospital, Allahabad. The present study was intended to identify the prevalence and nutritional assessment of metabolic syndrome associated CRF. Total 150 subjects were screened for renal function test & were taken for the present study. A pretested schedule was prepared for the survey. Schedule contains the information regarding demographic profile (age, education, family type and work status), clinical, anthropometric and dietary assessment. Appropriate statistical methods were used for data analysis. In this study, 150 (81 males and 69 females) subjects diagnosed CKD were sampled purposively. It was found that 44 percent subjects had hypertriglyceridemia, 71.33 percent had low HDL, 76 percent were hypertensive, 48 percent had hyperglycemia respectively. Metabolic syndrome was present in 55 (36.66%) subjects (CI 31–42%). Its prevalence was 32.09 percent in men and 42.02% in women. About 13.33 percent subjects were obese followed by 86.66 percent normal subjects. The mean score intake of calories, carbohydrates, protein and fat were lower than the RDA. It can be concluded that the prevalence of CRF associated with metabolic syndrome was 36.66 percent in Allahabad.

Keywords: Chronic Renal Failure, Hypertriglyceridemia, Hypertensive, Hyperglycemia.

1. Introduction
Metabolic syndrome is a major public health threat for 20 percent of the population which are above 30 years of age and older. (Lakka H.M. *et al,* 2002) [4] Excess body fat, especially abdominal visceral fat accumulation, is frequently accompanied by diabetes mellitus, dyslipidemia, and hypertension, and could result in atherosclerotic vascular diseases. According to the National Cholesterol Education Program, Adult Treatment Panel III (NCEP-ATP III) metabolic syndrome is defined as the presence of three or more of the following criteria: Elevated blood pressure (≥130/85 mm of Hg), elevated fasting plasma glucose level (≥110 mg/dl or ≥6.1 mmol/l), high serum triglyceride level (≥150 mg/dl), low serum HDL cholesterol level (<40 mg/dl in men and <50 mg/dl in women), waist circumference is >102 cm in men and >88 cm in women. Individuals with MS are at increased risk for development of chronic kidney disease (CKD). It is associated with many kinds of metabolic changes. Chronic renal failure is characterized by progressive deterioration of kidney function, which develops eventually into an End stage of chronic renal failure (CKF). CKF has traditionally been categorized as mild, moderate, or severe. Other poorly defined terms like uremia and end-stage renal disease (ESRD) have commonly been applied. Dietary protein is important in the daily rhythm of the metabolic process of the body. Due to nutritional imbalance some conditions like ketonuria, albuminemia, haematuria could be produced. Caloric deficiency affects creatinine and urea clearance. 24 hour excretion of endogenous creatinine is influenced adversely by low protein diet.

Chronic renal failure is associated with many kinds of metabolic Phenomena such as accumulation or deficit of various substances and dysregulation of metabolic pathways combine in the pathogenesis of these changes (Cibulka *et al.,* 2005) [1]. In the process of accumulation, decreased urinary excretion plays a crucial role and leads to retention of metabolites in the organism (e.g. creatinine, urea, electrolytes, and water). The increased formation of metabolites through catabolic processes and alternative metabolic pathways also exerts an influence. Regular dialysis treatment partly decreases this accumulation, but cannot avert the overall deficit. All of the above mentioned factors lead to many serious complications for CKD patients. All accelerate the development of atherosclerosis, malnutrition- inflammation complex syndrome (MICS), anemia, hyperparathyroidism, and other serious problems that markedly affect prognosis and the quality of life of patients with chronic renal failure. (Lindner *et al.,* 1974, Durak *et al.,* 1994, Silver 2000, Cibulka *et al.,* 2005) [5, 2, 6, 1] The recent studies found strong association between metabolic syndrome and chronic renal failure. Chronic kidney disease (CKD) is the negative consequence of metabolic syndrome. However, the prevalence and nutritional assessment of chronic renal failure patients along with metabolic syndromes have not been vigorously studied. Therefore a research is designed to elucidate the nutritional status of patients as well as the prevalence of CKD in Metabolic syndrome.

2. Material and Methods
Total 150 subjects were screened for renal function test and out of which 67 were excluded (not willing to take part) sample of

83 subjects was taken for the present study. A pretested schedule was prepared for the survey. Schedule contains the information regarding demographic profile (age, education, family type and work status), clinical, anthropometric and dietary assessment. Blood samples were taken for clinical assessment and were tested in pathology for triglycerides, fasting blood glucose & HDL. Blood pressure was determined by using sphygmomanometer. Nutritional anthropometry is concerned with the measurement of variations of physical dimensions, the gross composition and degree of nutrition. Hence, anthropometric measurements are useful criteria for assessing nutritional status. Body mass index of each subject will be calculated from the recorded height and weight measurement using the following formula (Park, 2007). A dietary survey will be conducted as described by Park (2007). The nutrient intake of the subjects will be calculated on the basis of 24 hours dietary recall method. The diet will be calculated for carbohydrate, protein & fat. The nutrient intake will be calculated using the food composition table by and compared with the ICMR standard values.

3. Result and Conclusion

It was found that 44 percent subjects had hypertriglyceridemia, 71.33 percent had low HDL, 76 percent were hypertensive, 48 percent had hyperglycemia respectively. Metabolic syndrome was present in 55 (36.66%) subjects (CI 31–42%). Its prevalence was 32.09 percent in men and 42.02% in women. About 13.33 percent subjects were obese followed by 86.66 percent normal subjects. The mean score intake of calories, carbohydrates, protein and fat were lower than the RDA. It can be concluded that the prevalence of CRF associated with metabolic syndrome was 36.66 percent in Allahabad.

Table 1:- Distribution of respondent on the basis of demographic profile

Factors	No. of Respondent			Prevalence (%)
	Respondent with MS	Respondent with Non MS	Total	
Gender				
Male	26	55	81	32.09 %
Female	29	40	69	42.02 %
Age				
35-44	3	7	10	6.66 %
45-54	17	33	50	33.34%
55-64	23	42	65	43.34%
65-75	12	13	25	16.66%
Education				
Literate	36	50	86	57.33%
Illiterate	19	45	64	42.66%

Table 2: Distribution of respondent on the basis of gender

Gender	Ms	Non Ms	Total	Prevalence %	Class Interval (CI)
Male	26	55	81	32.09 %	25-39
Female	29	40	69	42.02 %	34-50
Total	55	95	150	36.66 %	31-42

Table 3: prevalence of individual components of MS in CRF patients.

Components Of Ms	Normal Ms	High (Cases)	Total (Cases)	Prevalance %	Cut Off Value
TG*	84	66	150	44%	≥ 150mg/dl
FBS**	78	72	150	48%	≥6.1 mmol/l
BP***	36	114	150	76%	≥ 130/85mm of Hg
HDL****	43	107	150	71.33%	<40 mg/dl

***** Triglycerides, **fasting blood glucose, ***blood pressure & ****High Density Lipoprotein

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