A PROSPECTIVE STUDY OF RENAL FUNCTION IN TRIBAL PATIENTS IN RELATION TO HYPERTENSION PRESENTED WITH PEDAL OEDEMA IN EAST GODAVARI DISTRICT, ANDHRA PRADESH

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ABSTRACT

BACKGROUND

Health problems in tribal population are direct outcome of poverty, government policies that have adversely affected local livelihoods, high land alienations amongst tribals, threatened traditional agricultural practices, absence of forest rights and growing indebtedness. One study conducted by Yogesh Jain et al on tribes of central India indicated that in addition to infectious disease there is trend towards non-communicable diseases also.

The aim of the study is to study the renal disease in relation to hypertension among tribal population of east Godavari District who is attending the OPD of General Medicine Department with pedal oedema.

MATERIALS AND METHODS

The present study was designed to study the renal profile in tribal population of east Godavari District, Andhra Pradesh, who are attending the General Medicine OPD having pedal oedema. This study was conducted in the Department of General Medicine, Rangaraya Medical College, Kakinada, A.P., from April 2013 to September 2017. During the period of study, a total of 94 patients were enrolled for the study based on exclusion and inclusion criteria. Patients were divided into two groups, one group having stage 1 hypertension and second with stage 2 hypertension. Various parameters were measured like age, sex, BMI, SBP, DBP, serum urea, serum creatinine, eGFR FBS, total cholesterol, HDL, LDL, TG and ultrasonography was done for all patients.

RESULTS

Mean of serum urea in stage I hypertensive patient were 42.60 mg/dL, and stage II hypertensive patient, it was 70.20 mg/dL with p value 0.011796. Serum creatinine mean value was 2.09 in stage I hypertensive patient and 3.61 in stage II hypertensive patients. GFR was calculated and its mean value in stage I hypertensive patient was 96.48 mL/min./1.73 m^2 and in stage II hypertensive patient, it was 76.98 mL/min./1.73 m2 with p value 0.0326, which was significant statically.

CONCLUSION

There is a linear increase in blood urea with increase in blood pressure. This supports our study. We have found that there is statistically significant difference in serum urea level in both group and mean of serum urea was higher in stage II hypertensive group. There was significant difference in mean serum creatinine between two groups of patients, but it was higher in stage II hypertensive patient than stage I. It indicates that as the severity of disease increases, the renal damage also increases. In present study, we have studied the relation between hypertension with renal disease. We have found that hypertensive patients were have increased BMI and dyslipidaemia. We have observed that as the stage of hypertension increased, the renal function were also deteriorated and was evident from ultrasonographic finding.

KEYWORDS

Renal Function, Hypertension, Pedal Oedema, Tribal Patients.

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BACKGROUND

As per district wise population of scheduled tribes of Andhra Pradesh 2011 census population of tribes in East Godavari District was 5.62% of total population, out of that, 2.73% was male and 2.88% was female.[1] Health problems in tribal population are direct outcome of poverty, government policies that have adversely affected local livelihoods, high land alienations amongst tribals, threatened traditional agricultural practices, absence of forest rights and growing indebtedness.[2] One study conducted by Yogesh Jain et al on tribes of central India indicated that in addition to infectious disease, there is trend towards non-communicable diseases also.[3] Gautam Kumar et al also found that there is charging trend of disease pattern in tribal population. He has found that younger tribal males are having tendency towards increasing metabolic risk factor.[4] So, present study has been designed with an aim to study the renal disease in relation

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to hypertension among tribal population of east Godavari District who is attending the OPD of General Medicine Department with pedal oedema.

MATERIALS AND METHODS

The present study was designed to study the renal profile in tribal population of east Godavari District, Andhra Pradesh, who are attending the General Medicine OPD having pedal oedema. This study was conducted in the Department of General Medicine, Rangaraya Medical College, Kakinada, AP, from April 2013 to September 2017. Before start of this study, a written permission was obtained from institutional ethics committee. An informed written consent was obtained from each patient before enrolment of them in this study group. During the period of study, a total of 94 patients were enrolled for the study based on exclusion and inclusion criteria. Patients were divided into two groups, one group having stage 1 hypertension and second with stage 2 hypertension.

Inclusion Criteria	Exclusion Criteria
Age 25 to 60 years	CHF, cirrhosis of liver, thyroid dysfunction
Both sexes	
From tribal district native	
Pedal oedema	

Various parameters were measured like age, sex, BMI, SBP, DBP, serum urea, serum creatinine, eGFR, FBS, total cholesterol, HDL, LDL, TG and ultrasonography was done for all patients. Serum urea was estimated by enzymatic urease method. Serum creatinine was estimated by Jaffe's method.[5] Hexokinase method was used for estimation of plasma glucose. For total cholesterol, we used Liebermann-Burchard reaction colorimetric method; triglyceride was estimated by method of Neri and Fringe. HDL concentration was estimated by precipitation method. LDL concentration was calculated by WHO formula, LDL cholesterol = total cholesterol TG/5 HDL (mg/dL).[6] Glycosylated haemoglobin was measured by spectrophotometer. We defined eGFR using the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation. Sonography is an important non-invasive investigating tool in evaluation of diseases of the kidney. By grading the renal parenchymal changes, the severity of the disease can be assessed. We used ultrasonography Philips ClearVue USG. For statistical analysis, unpaired t-test was used and P value below 0.05 was taken as significant.

RESULTS

During two and a half year of study period, 94 patients were included in this study who were coming to Rangaraya Medical College from tribal region of east Godavari District. Out of this 94 patients, 63 were males and 31 were females. Mean age of the patients were 48.32 yrs. and body mass index of the patients were 26.88 kg/m2.

As per Table 2, out of 94 patients, 8 were normotensive, 10 having prehypertension, 40 patient had stage I hypertension and 36 patients having stage II hypertension.

Parameter	Value
Age	48.32 yrs. (mean)
Sex M/F	63/31
BMI	26.81 kg/m2 (mean)

Table 1. Demographic Profile

Normal	Prehypertension	Stage I	Stage II
8	10	40	36

Table 2. Distribution of Hypertension

Parameter	Values (Mean)		P Value
	Stage I	Stage II	
FBS (mg/dL)	79.34	99.46	0.0243
TCHOL (mg/dL)	152.90	189.00	0.00139
HDL (mg/dL)	44.30	38.70	0.0359
LDL (mg/dL)	86.40	110.90	0.03137
TG (mg/dL)	108.30	162.40	0.0007

Table 3. Relation between Stage of Hypertension and Metabolic Profile

Parameters	Stage 1 (Mean)	Stage 2 (Mean)	P value
Serum urea (mg/dL)	42.60	70.20	0.011796
Serum creatinine (mg/dL)	2.09	3.61	0.04337
eGFR (mL/min./1.73 m2)	96.48	76.98	0.00326

Table 4. Relation between Stage of Hypertension and Renal Profile

		Hypertension	
		Stage I	Stage II
Size	Normal	28	10
	Enlarged	12	26
Grades of renal cortical echogenicity	Normal	9	4
	Grade I	8	9
	Grade II	6	4
	Grade III	4	6
	Grade IV	0	8

Table 5. Relation between USG Finding and Stage of Hypertension

As per Table 3 regarding metabolic parameters, fast blood sugar mean value was 79.34 mg/dL in stage I hypertensive group and 99.46 mg/dL in stage II group with P value 0.0243, which is statistically significant. Total cholesterol was 79.34 mg/dL in stage I and 99.46 mg/dL in stage II with P value 0.00139, which was significant. HDL concentration was 44.30 mg/dL in stage I and 38.70 mg/dL in stage II with P value 0.0359 low-density lipid concentration in stage I hypertensive patient was 86.40 mg/dL and 110.90 mg/dL in stage II hypertensive patient with P value 0.03139. Serum triglyceride level was 108.30 mg/dL in stage I hypertensive patient and 162.40 mg/dL in stage II hypertensive patient.

As per Table 4, mean of serum urea in stage I hypertensive patient were 42.60 mg/dL, and stage II hypertensive patient, it was 70.20 mg/dL with 'p' value 0.011796. Serum creatinine mean value was 2.09 in stage I hypertensive patient and 3.61 in stage II hypertensive patients. GFR was calculated and its mean value in stage I hypertensive patient was 96.48 mL/min./1.73 m^2, and in stage II hypertensive patient, it was 76.98 mL/min./1.73m^2 with p value 0.0326, which was significant statically.

Regarding ultrasonography finding size of the kidney in stage I hypertensive patients, out of 40 patients, 28 having normal size kidney and 12 having kidney size enlarged. In stage II hypertensive patients, out of 36 patients, normal size of kidney was found in 10 patients and enlarged kidney was found in 26 patients. Regarding grading of cortical echogenicity, in stage I, 9 patients and stage II 4 patients have normal kidney. Grade 1, cortical echogenicity was found in 8 stage I patients and 9 stage II patients; grade 2, cortical echogenicity was found in 6 stage I patients and 4 stage II patients; grade 3, cortical echogenicity was found in 4 stage I patients and 6 stage II patients; grade 4, cortical echogenicity was absent in stage I patient, but it was present in 8 stage II patients.

DISCUSSION

Total 94 patients were included in this study having mean age 48.32 hrs. and numbers of male patient were more than female. In present study, we have found that patient attending OPD with pedal oedema have mean BMI 26.81 kg/m^2, which is toward higher side. There are few studies available regarding this finding. Gautam et al[4] has discussed about the tribal groups that acculturation of their food habit subject to these changes and so also the lifestyle. It has been found that higher BMI is associated with hypertension in tribal population. We have found that 94 patients, we have included in this study, only 8 were normotensive and 10 were prehypertensive, but rest were either stage I or stage II hypertensive who had come to OPD with pedal oedema. Fasting blood sugar were little higher in stage II hypertensive patient than in stage I, but both were in normal range. We have found that in both stages of hypertension, dyslipidaemia was present, but it was more in stage 2 hypertensive group than stage 1. This finding is supported by the finding of Kammon et al.[7]

As per the study of Bulpitt et al,[8] there is a linear increase in blood urea with increase in blood pressure, this supports our study. We have found that there is statistically significant difference in serum urea level in both group and mean of serum urea was higher in stage II hypertensive group. There was significant difference in mean serum creatinine between two groups of patients, but it was higher in stage II hypertensive patient than stage I. It indicates that as the severity of disease increases, the renal damage also increases. This finding is suppressed by the study of Rakhee Yadav[9] et al and also supported by the study of Shulman et al.[10] We found that in tribal population patients with stage II hypertension have significantly low eGFR in comparison to stage I patients, which is supported by the study of Rebecca et al.[11]

We have found that more number of patients in stage 2 hypertension group has large kidney and higher grade of cortical echogenicity. This observation is supported by the study of Vinayaka[12] et al and Jasdease[13] et al.

CONCLUSION

In present study, we have studied the relation between hypertension with renal disease. We have found that hypertensive patients have increased BMI and dyslipidaemia. We have observed that as the stage of hypertension increased, the renal function were also deteriorated and was evident from ultrasonographic finding.

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