

# Prevalence and Determinants of Hypertension in a rural population in South India- a Cross-sectional, Observational study

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## Objectives

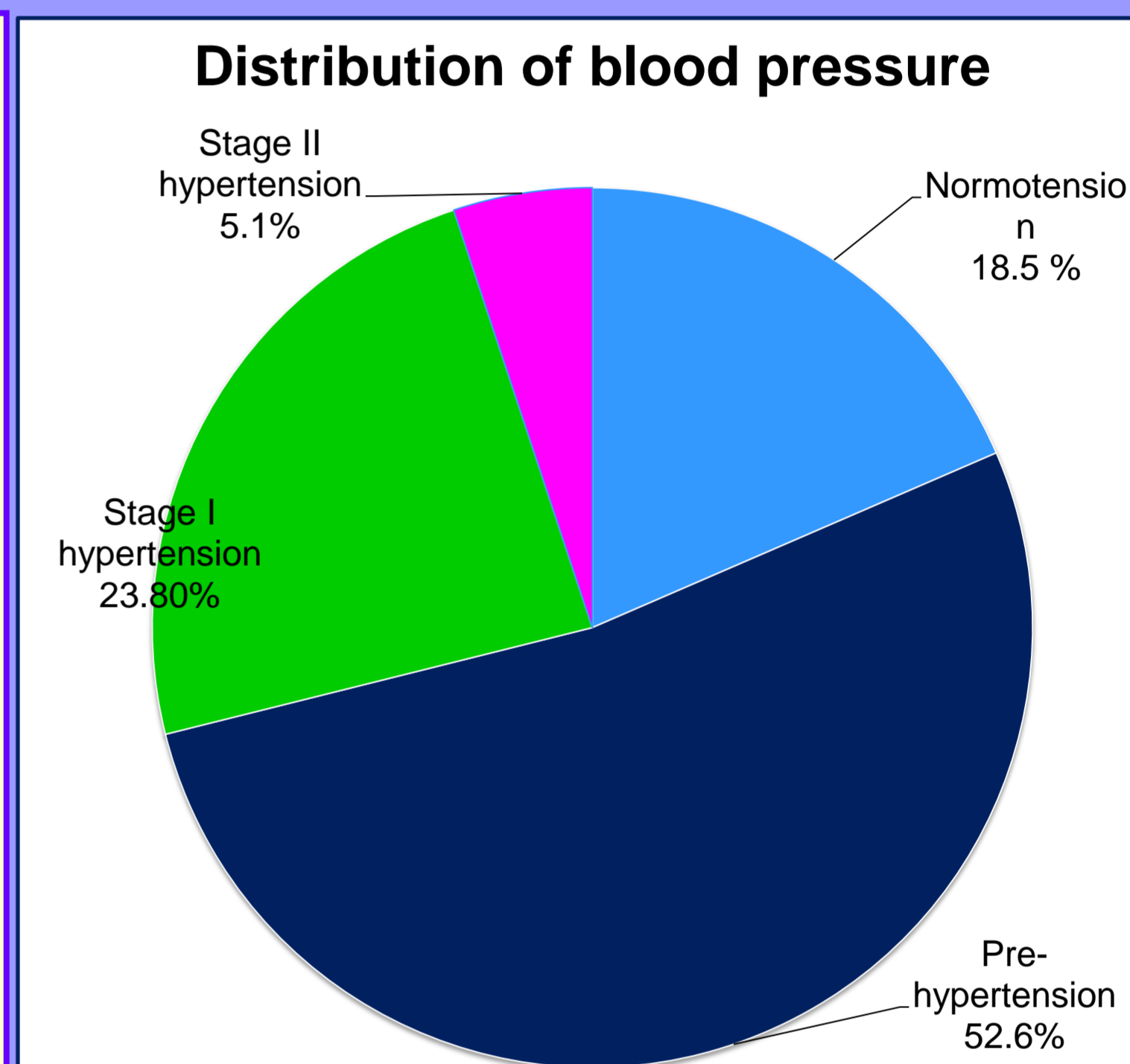
- To study the prevalence of hypertension and its determinants in a rural population in South India.
- To explore the association with kidney damage indicators, namely microalbuminuria, proteinuria and estimated GFR

## Methods

- Door-to-door survey conducted in three villages in Shivamogga district in South India.
- Questionnaire administered and demographic data collected.
- Anthropometric data – Ht, Wt, BMI, WC and HC
- BP recorded twice with mercury sphygmomanometers and average taken
- Urine dipstick for protein and microalbuminuria.
- Microalbuminuria rechecked in those positive first time and confirmed with ACR done with dipstick
- FBS and Serum creatinine checked in 1331 individuals. GFR estimated (MDRD).

## Results

- 2984 adult subjects screened (age ≥ 18 yrs) and BP recorded.
- Mean age-39.01 ± 15.23 years; Range-18-90 years. Nearly 75% were aged less than 50 yrs. Males-49.4%
- Prevalence of Hypertension- 30.4%
- Awareness-28.5%; Control -12.4%
- Prehypertension -52.6%



Variable	Subjects N	Hypertension		No hypertension		P-value
		Mean	SD	Mean	SD	
Age, yr	2984	48.11	15.78	35.02	13.15	<0.001*
Systolic BP, mmHg	2984	134.48	13.44	118.59	7.94	<0.001*
Diastolic BP, mmHg	2984	89.47	7.52	76.03	5.62	<0.001*
BMI, kg/sq m	2984	21.70	3.79	20.80	3.43	<0.001*
Waist Circumference, cm	2984	80.41	11.04	77.10	9.74	<0.001*
Hip Circumference, cm	2984	87.74	10.45	84.84	9.26	<0.001*
Serum creatinine, mg/dl	1331	0.88	0.56	0.82	0.16	0.02*
eGFR(MDRD), ml/min/sq m	1331	92.07	21.53	100.86	21.58	<0.001*

Differences in variables between hypertensive and non-hypertensive subjects P value less than 0.05 is taken significant  
Determinants which are significant indicated by bold type font and \*

Determinant	Hypertensives N=434		Nonhypertensives N=897		Univariate P value	OR(95%CI)
	Number(%)	Number(%)	Number(%)	Number(%)		
Age>50 yrs	212(48.84)	142(15.83)			<0.001*	5.08(3.92-6.59)
Males	472(46.54)	1003(42.69)			0.185	0.86(0.68-1.07)
Occupation	231(53.22)	453(50.50)			0.351	1.12(0.89-1.40)
Smoking	39(8.98)	77(8.58)			0.807	1.05(0.70-1.57)
Alcohol	42(9.67)	68(7.58)			0.193	1.31(0.87-1.95)
Tobacco chewing	118(27.18)	197(21.96)			<b>0.035*</b>	1.33(1.02-1.73)
Obesity(BMI)	71(16.3)	86(9.5)			<0.001*	1.84(1.32-2.59)
Abd. obesity	375(86.4)	762(84.95)			0.48	1.13(0.81-1.57)
Diabetes	53(12.2)	35(3.9)			<0.001*	3.43(2.20-5.34)
Proteinuria	21(4.8)	16(1.8)			<b>0.001*</b>	2.8(1.45-5.42)
Microalbuminuria	23(5.3)	25(2.7)			<0.001*	1.95(1.10-3.48)
Decreased GFR	21(4.8)	14(1.6)			<0.001*	3.21(1.62-6.37)

### Determinants of hypertension in univariate analysis

P value<0.05 taken as significant; OR- odds ratio; CI- confidence intervals

Determinants which are significant indicated by bold type font and \*

Variables	P value	Adjusted OR	95% confidence intervals for OR	
			Lower	Upper
Age	<0.001*	<b>4.69</b>	3.59	6.12
Diabetes	<0.001*	<b>2.46</b>	1.51	4
Proteinuria	<b>0.013*</b>	<b>2.52</b>	1.21	5.22
Microalbuminuria	0.77	1.11	0.56	2.18
Decreased GFR	0.153	1.75	0.81	3.78
Obesity	<b>0.014*</b>	<b>1.60</b>	1.1	2.32
Tobacco use	0.54	1.09	0.82	1.46

### Determinants of hypertension in multivariate analysis

P value<0.05 taken as significant; OR- odds ratio; CI- confidence intervals

Determinants which are significant indicated by bold type font and \*

## Conclusions

- There is significant prevalence of hypertension even in a rural, agriculture based predominantly non-sedentary population in South India
- The low level of awareness, very poor control, the high burden of prehypertension and the very strong association with renal disease indicators has important implications for the cardiovascular and kidney disease burden in the future.

## References

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