

**A STUDY ON HYPERTENSION AMONG CHRONIC KIDNEY DISEASE PATIENTS ADMITTED IN THE NEPHROLOGY DEPARTMENT OF GGH, KURNOOL**Y. Padma Sri<sup>1</sup>, T. Siva Kala<sup>2</sup>**HOW TO CITE THIS ARTICLE:**

Y. Padma Sri, T. Siva Kala. "A Study on Hypertension among Chronic Kidney Disease Patients Admitted in the Nephrology Department of GGH, Kurnool". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 29, April 09; Page: 5017-5022, DOI: 10.14260/jemds/2015/731

**ABSTRACT: BACKGROUND:** Hypertension is both a risk factor and complication of chronic renal disease. Managing hypertension plays a significant role in preventing complications and slowing down the progression as well. **OBJECTIVES:** 1. To study the association between hypertension and CKD. 2. To study the other known risk factors associated with hypertension. **METHODOLOGY:** Study design-Cross sectional descriptive study period- June to November 2012, Study area- The Department of Nephrology, Government General Hospital, Kurnool. **STUDY SUBJECTS:** All the chronic kidney disease patients admitted in the Nephrology ward from June to November 2012 are included in the study and are interviewed with a Pre-designed semi structured questionnaire. **STATISTICAL ANALYSIS:** proportions, percentages, chi- square. **RESULTS:** A total of 153 subjects were included in the study. Their mean age was 47.96±11.14 years. Hypertension was present in 126 (82.35%) of the patients with CKD. **CONCLUSIONS:** Smoking and Alcohol consumption had a significant association with hypertension among CKD patients. Presence of hypertension had an increased risk for heart disease among CKD patients. Inadequately controlled hypertension had significant association with occurrence of heart disease.

**KEYWORDS:** Hypertension, chronic kidney disease, other risk factors.

**INTRODUCTION:** Chronic kidney disease (CKD) is emerging as a major public health problem in developed as well as developing countries. The prevalence of chronic kidney disease in the population is a considerable social and economic problem worldwide, and one that is increasing<sup>1</sup>. One of the reasons for this is said to be the rapidly increasing incidence of hypertension. Hypertension has been reported to occur in 85% to 95% of patients with CKD (stages 3–5). The relationship between hypertension and CKD is cyclic in nature. Uncontrolled hypertension is a risk factor for developing CKD, is associated with a more rapid progression of CKD, and is the second leading cause of ESRD. It has been recently estimated that the age-adjusted incidence rate of ESRD in India to be 229 per million population (pmp).<sup>2</sup> Meanwhile, progressive renal disease can exacerbate uncontrolled hypertension due to volume expansion and increased systemic vascular resistance.<sup>3</sup> Studies have also shown that better blood pressure control slows progression of chronic kidney disease. Lowering blood pressure will reduce the risk of heart disease, which for most patients with chronic kidney disease, is more of an immediate threat than end stage renal disease.<sup>4</sup> Alcohol and smoking are said to play key role in the management of hypertension and blood pressure can often be lowered without medication merely by reducing consumption of alcohol. The present study is undertaken to understand the role of hypertension and its management in CKD patients admitted in the nephrology department of Kurnool Medical College.

**OBJECTIVES:**

1. To study the association between hypertension and Chronic Kidney Disease.
2. To study the other known risk factors and complications associated with hypertension among CKD patients.

**MATERIALS AND METHODS:**

**Study Design:** Cross sectional descriptive study.

**Study Period:** June to November 2012,

**Study Area:** The Department of Nephrology, Government General Hospital, Kurnool.

**Study Subjects:** The chronic kidney disease patients admitted in the Nephrology ward from June to November 2012 were included in the study and were interviewed with a Pre-designed semi structured questionnaire. Three readings of blood pressure were obtained in the sitting position after at least 5 minutes of quite rest. A subject was considered hypertensive if one had systolic blood pressure (SBP) of  $\geq 140$  mmHg or diastolic blood pressure (DBP) of  $\geq 90$  mmHg (the average of two measures that were taken in the seated position) , or if he or she was using antihypertensive medication. The diagnosis and classification of HTN was done according to the JNC-VII report on Hypertension.<sup>4</sup>

**Statistical Analysis:** Chi-square test and percentages.

Data analyzed by EPIINFO software version 7.

**RESULTS:** Total study subjects were 153 in number. Their age ranged from 13 to 75yrs and the Mean age was  $47.96 \pm 11.14$  years. Hypertension was present in 126(82.35%) of the patients with CKD. Age had a significant association with the presence of hypertension ( $p < 0.05$ ) whereas gender, education, economic status had no difference (Table 1). 90.48% of the hypertensive patients were in stage 4 CKD when compared to 74.07% of the patients with normal blood pressure which was statistically significant ( $p < 0.05$ ) (Table 2). Of all the patients with hypertension 69(54.7%) were having hypertension before the diagnosis of CKD, 40(31.75) were simultaneously diagnosed along with CKD and 13.49% of the patients developed hypertension after the diagnosis of CKD (Figure 1) Family history of CKD was reported by 23.02% of the hypertensive patients whereas none of the patients with normal blood pressure had family history of Chronic Kidney Disease ( $p < 0.05$ ) (Table 3). Presence of Hypertension had an increased risk (15.87% vs. none,  $P < 0.05$ ) for Heart disease. (Table 4) Only 4.35% of the patients with blood pressure under control had heart disease when compared to 29.82% of the patients with inadequate control ( $p < 0.05$ ) (Table 5) Among 105 male CKD pts 88.24% of the smokers had hypertension compared to 70% of non-smokers which is statistically significant ( $P < 0.05$ ) (Table 6). Similarly alcoholics had increased risk (88.89% vs. 70.83%,  $P < 0.05$ ) compare to non-alcoholics for hypertension (Table 7).

**DISCUSSION:** This study revealed overall prevalence of hypertension among CKD patients admitted into the nephrology ward over a period of six months to be 82.35%, which corresponds to the figure of 80% noted by a study done by Dr. Ronald M, Goldin et al.<sup>1</sup> The prevalence of hypertension was progressively increasing with the severity of CKD; 9.52% of the hypertensive patients were in stage3, and 90.48% in stage 4-5 CKD. Based on a national survey of representative sample of non-institutionalized adults in the USA, it is estimated that hypertension occurs in 23.3% of individuals

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without CKD, and 35.8% of stage 1, 48.1% of stage 2, 59.9% of stage 3, and 84.1% of stage 4-5 CKD patients.<sup>6</sup>

A study done by J. A. Whitworth et al showed that more than half the patients with CKD die from a cardiac or vascular event.<sup>4</sup> In a study done by He J et al it was found that adults using healthy lifestyle changes were six times more likely to have controlled hypertension.<sup>7</sup> Study done by Coresh et al. 2003 in their NHANES III Cross-sectional Survey revealed that 51.4% of those with Hypertension on no medication and 64.4% of those with Hypertension on medication had reduced GFR.<sup>8</sup>

Segura et al. 2004 (83) in their Observational cohort study looking at relationship between blood pressure and CKD observed that among patients with essential hypertension and normal renal function at baseline and a mean follow-up of 13.2 years, 14.6% developed renal insufficiency.<sup>9</sup>

**CONCLUSIONS:** This study revealed prevalence of hypertension among CKD patients to be 82.35%. Increasing age (>40 yrs.) had a significant association with hypertension among CKD patients. Individuals with hypertension and family history of CKD had increased risk of developing CKD. Smoking and Alcohol consumption had a significant association with hypertension among CKD patients. Presence of hypertension had an increased risk for heart disease among CKD patients. Inadequately controlled hypertension had significant association with occurrence of heart disease.

**RECOMMENDATIONS:** All efforts should be made to detect and strictly control hypertension in prevention and management of CKD. As an initial step, individuals aged more than 40 years and with family history of CKD should be screened for hypertension and CKD. Increased efforts are needed to identify the reasons for inadequate control of hypertension and approaches to increase blood pressure control among patients with CKD. Changes in life style (smoking, alcohol) are also necessary for control of hypertension along with pharmacological treatment. CKD patients with hypertension should be regularly screened for cardiovascular disease.

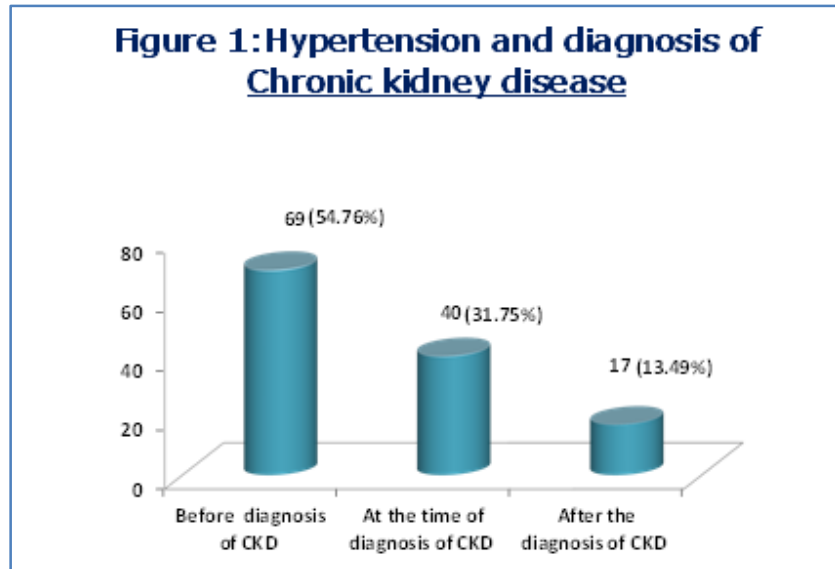
Socio demographic factors	Hypertension present	Hypertension absent	P-value
Male	89 (84.76%)	16 (15.24%)	> 0.05
Female	37 (77.08%)	11 (22.92%)	
< 40y	17 (65.38%)	9 (34.62%)	<0.05
≥ 40y	109 (85.83%)	18 (14.17%)	
<12y of education	108 (81.20%)	25 (18.80%)	> 0.05
>12y of education	18 (90%)	2 (10%)	
BPL	114 (82.01%)	25 (17.99%)	>0.05
APL	12 (85.71%)	2 (14.29%)	

**Table 1: Hypertension and socio-demographic distribution of the study subjects**

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	CKD stage 3	CKD stage 4	Total	$\chi^2$ value: 5.5001
Hypertensives	12 (9.52%)	114 (90.48%)	126 (100%)	
Normotensives	7 (25.93%)	20 (74.07%)	27 (100%)	P-value: < 0.05
<b>Total</b>	<b>19 (12.42%)</b>	<b>134 (87.58%)</b>	<b>153 (100%)</b>	

**Table 2: Hypertension Vs Stage of Chronic kidney Disease**



Subjects	Family history of CKD		Total	$\chi^2$ value: 6.2425
	Present	Absent		
Hypertensives	29 (23.02%)	97 (76.98%)	126 (100%)	
Normotensives	0 (0%)	27 (100%)	27 (100%)	P-value: < 0.05
<b>Total</b>	<b>29 (18.95%)</b>	<b>124 (81.05%)</b>	<b>153 (100%)</b>	

**Table 3: Hypertension and Family history of Chronic Kidney disease among CKD patients**

Subjects	Heart disease		Total	$\chi^2$ value: 4.9302
	Present	Absent		
Hypertensives	20 (15.87%)	106 (84.31%)	126 (100%)	
Normotensives	0 (0%)	27 (100%)	27 (100%)	P-value: < 0.05
<b>Total</b>	<b>20 (13.01%)</b>	<b>133 (86.93%)</b>	<b>153 (100%)</b>	

**Table 4: Hypertension vs Heart disease among Chronic kidney Disease patients**

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Hypertension	Heart disease		Total	$\chi^2$ value: 15.1721
	Present	Absent		
Under control	3 (4.35%)	66 (95.65%)	69 (100%)	P-value: < 0.05
Inadequate control	17 (29.82%)	40 (70.18%)	57 (100%)	
<b>Total</b>	<b>20 (15.87%)</b>	<b>106 (84.13%)</b>	<b>126 (100%)</b>	

Table 5: Control of Hypertension Vs Heart disease among CKD patients

Smoking	Hypertensives	Normotensives	Total
Present	75 (88.24%)	10 (11.76%)	85 (100%)
Absent	14 (70%)	6 (30%)	20 (100%)
<b>Total</b>	<b>89 (84.57%)</b>	<b>16 (15.24%)</b>	<b>105 (100%)</b>

Table 6: Smoking Vs Hypertension among Male Chronic kidney Disease patients (n=105)

$\chi^2$  4.1683 P= 0.04.

Alcohol consumption	Hypertensives	Normotensives	Total
Yes	72 (88.89%)	9 (11.11%)	81 (100%)
No	17 (70.83%)	7 (29.17%)	24 (100%)
<b>Total</b>	<b>89 (84.76%)</b>	<b>16 (15.24%)</b>	<b>105 (100%)</b>

Table 7: Alcohol vs. Hypertension among Male Chronic kidney Disease patients (n=105)

$\chi^2$  = 4.6730, P = 0.03.

**ACKNOWLEDGEMENTS:** The authors are grateful for the support given by Dr A. Sree Devi, Prof and HOD, Department of community medicine and Dr N. Jikki, Prof and HOD, Department of Nephrology, Kurnool Medical College.

### REFERENCES:

1. Dr. Ronald M. Dr. Goldin MD at al. Hypertension and CKD. Issue of kidney beginnings: The magazine, 2005; 4: 1.
2. Modi GK, Jha V: The incidence of end-stage renal disease in India: a population-based study. *Kidney Int* 2006, 70 (12): 2131-3.
3. Leticia Buffet, PharmD, Charlotte Ricchetti, PharmD, BCPS, CDE Chronic Kidney Disease and Hypertension A Destructive Combination <http://www.medscape.com/>.
4. JA Whitworth et al. Progression of Renal Failure – The Role of Hypertension. *Ann Acad Med Singapore*: 2005; 34: 8-15.
5. US Department of Health and Human Services. National institute of health, USA. Seventh report of the Joint national committee on Hypertension (JNC-VII). December 2003.

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6. U S Renal Data System, USRDS 2010 Annual Data Report: Atlas of Chronic Kidney Disease and End-Stage Renal Disease in the United States, National Institutes of Health, National Institute of Diabetes and Digestive and Kidney Diseases. Bethesda, Md, USA, 2010.
7. He J et al. Factors associated with hypertension control in the General population of the United States. Arch Intern Med. 2002; 162: 1051-1058.
8. Coresh J, Aster BC, Greene T, Eknoyan G, Levey A S Prevalence of Chronic Kidney Disease and Decreased Kidney Function in the adult U S population: Third national health and nutrition examination survey. Am J Kidney Dis (2003) 41: 1-12.
9. Segura J, Campo C, Gil P, Roldan C, Visi l L, Rodicio JL et al. Development of Chronic Kidney Disease and cardiovascular prognosis in essential Hypertensive patients. J Am Soc Nephrol. 2004; 15: 1616 -1622.

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**FINANCIAL OR OTHER**
**COMPETING INTERESTS:** None

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Date of Submission: 12/03/2015.  
Date of Peer Review: 13/03/2015.  
Date of Acceptance: 26/03/2015.  
Date of Publishing: 08/04/2015.