



International Journal of Allied Medical Sciences and Clinical Research (IJAMSCR)

ISSN:2347-6567

IJAMSCR |Volume 6 | Issue 1 | Jan - Mar - 2018
www.ijamscr.com

Research article

Medical research

Study of carotid intima media thickness in patients of Non diabetic chronic kidney disease

Mohamed Azeem Sherfudeen¹, Jagadeesan Mohanan², Prasanna Karthik suthakaran³, Chitrabalam Pavadai⁴

¹Department of General Medicine, Saveetha Medical College Hospital, Chennai, Tamilnadu, India

²Department of General Medicine, Saveetha Medical College Hospital, Chennai, Tamilnadu, India

³Department of General Medicine, Saveetha Medical College Hospital, Chennai, Tamilnadu, India

⁴Department of General Medicine, Saveetha Medical College Hospital, Chennai, Tamilnadu, India

*Corresponding Author: Mohamed Azeem Sherfudeen

Email id: ms.sherfudeen@gmail.com

ABSTRACT

Background

Patients with chronic kidney disease are at high risk for developing cardiovascular complications. Cardiovascular diseases are a major cause of morbidity and mortality in patients of chronic kidney disease due to accelerated atherosclerosis. Measuring the CIMT is a useful marker of atherosclerosis in chronic kidney disease patients. Coronary artery atherosclerosis can also be correlated with CIMT thickness.

Aims and objectives

This study focuses on assessing the carotid intima media thickness in patients of non-diabetic kidney disease among the patients admitted in medical wards of saveetha medical college hospital, Chennai.

Materials and methods

This was a prospective study of carotid intima media thickness in patients of non-diabetic CKD, done in the Department of Medicine, saveetha Medical College & Hospital, Chennai. A total of 50 patients of non-diabetic CKD were enrolled. Measurement of intima media thickness was done bilaterally in the common carotid arteries and higher value of CIMT of any one carotid artery was recorded using Doppler Ultrasound.

Results

Out of 50 patients of CKD, 42 were males and 8 were females. 22 patients belonged to Stage 3 CKD, 18 patients belonged to stage 4 and stage 5 CKD was observed in 10 patients. CIMT in CKD patients was between 0.9 to 1.0mm. The mean age was 52.6(35-74) years. Hypertension was observed in 38 patients and Dyslipidaemia in 15 patients.

Conclusion

CIMT measurement was done in our study population of 50 patients and CIMT was found to be increased in patients of non-diabetic chronic kidney disease irrespective of the stage of CKD. Patients with High mean blood pressure had high CIMT values as compared to patients having low mean blood pressure. Patients with dyslipidaemia were found to have high levels of CIMT. It is concluded in our study that CIMT was higher in patients with chronic kidney disease irrespective of the stage in Non-diabetic patients.

Keywords: CIMT, CKD.

INTRODUCTION

Global burden of chronic kidney disease has been increasing in the recent times. As the morbidity and mortality from communicable diseases decline, life expectancy increases and degenerative diseases have become more common. CKD is amongst the chronic-non-infectious illnesses in that there is a very real opportunity to continue living comfortably in spite of being terminally ill. Chronic kidney patients are at high risk for developing cardiovascular diseases. The risk of cardiovascular disease in those with CKD compared to the age and sex matched general population ranges from 10-20 folds, depending on the stage of CKD.

Measuring the carotid intima media thickness by ultrasonography in patients with chronic kidney disease is a relatively simple, non-invasive and cost effective method of assessing atherosclerosis. CKD patients are vulnerable to develop cardiovascular and cerebrovascular complications. CIMT measurements assess the risk for future cardiovascular events and analyse the effect of drug therapy. Carotid intima media thickness is taken as a useful surrogate marker of atherosclerosis. Agarwal et al. found a higher CIMT in patients with Diabetes mellitus who also had coronary artery disease which was not clinically overt, leading to the conclusion that measuring the CIMT is a reliable marker for diagnosing subclinical coronary artery disease in patients with Diabetes mellitus. The Aim of the present study is to assess the CIMT in non-diabetic CKD patients thereby demonstrating that CKD as such is an inflammatory disease leading to atherosclerosis irrespective of the stage of CKD.

MATERIALS AND METHODS

Study was conducted in the Department of Medicine, Saveetha Medical College & Hospital, Chennai. After obtaining consent from CKD patients of all aetiologies belonging to stage [3-5] were included in the study. Patients with Acute kidney injury and diabetes were excluded from the study. Total 50 patients of CKD were enrolled and the study was conducted for a period of 6 months. Complete blood count, urea, creatinine, Fasting lipid profile, urine routine examination, serum electrolytes reports were collected. eGFR was calculated using the MDRD formula. **The MDRD formula** is as follows: **eGFR = 186.3x (serum creatinine^{-1.154}) x (age^{-0.203}) x 1.212 (if black) x0.742 (if female)**. Patients with CKD were subjected for high resolution B-mode carotid ultrasonography. Bilateral assessment of intimal thickness was done in common carotid artery and higher CIMT value of any carotid artery was recorded. Hypertension was considered as blood pressure ≥ 140 mmHg systolic and/or ≥ 90 mmHg diastolic. Dyslipidaemia was considered as LDL cholesterol ≥ 100 mg/dl or total cholesterol ≥ 200 mg/dl or HDL in males < 40 mg/dl or HDL in females < 30 mg/dl, triglycerides level ≥ 200 mg/dl or VLDL ≥ 30 mg/dl. Analysis was done using SPSS software; t test was applied to compare the CIMT of patients and controls.

RESULTS

Out of total 50 patients of CKD, 42 were males and maximum numbers of CKD patients were in age group between 34 to 74 years. 85.1% patients were having anemia, 61.2% patients were having edema and 48% patients were having complaints of decreased urine output.

Table 1: Risk factors like hypertension, dyslipidaemia, and smokers were also found in CKD patients

Risk factors	NO OF CASES (N=50)	PERCENTAGE
Dyslipidaemia	15	30
Hypertension	38	76
Smoking	12	24

Table 2: The stage wise distribution of CKD patients and their respective mean CIMT values

CKD STAGE	NO OF PATIENTS	CIMT VALUE
STAGE III	22	0.9±0.24
STAGE IV	18	0.9 ±0.23
STAGE V	10	0.9 ± 0.23

24% of total patients were having mean BP between 90 to 130 mmHg, 76% of total patients has mean BP >130 mmHg. Patients having high mean BP

was having higher mean CIMT in comparison to patients having lower mean BP (figure 1).

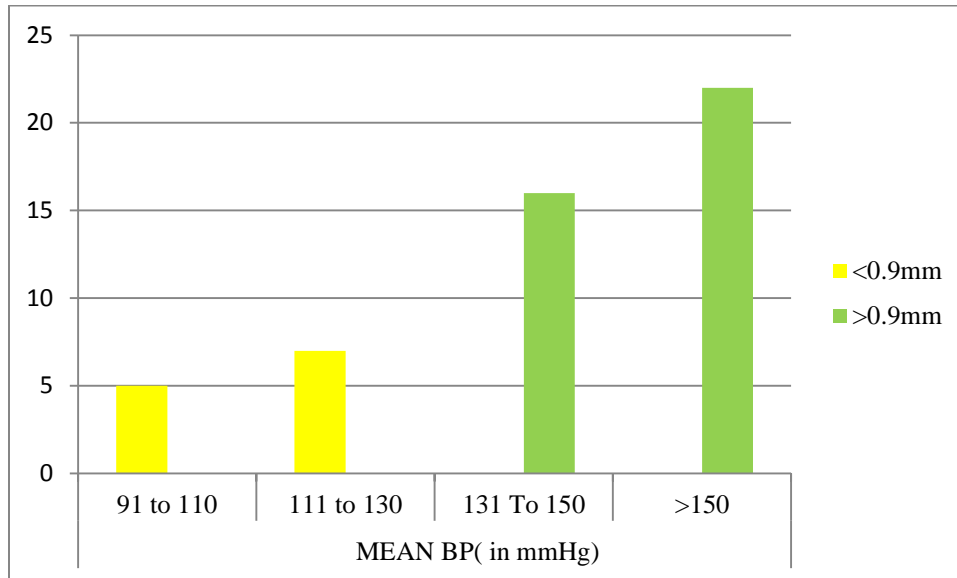


Figure 1 – BLOOD PRESSURE VS CIMT

DISCUSSION

Chronic kidney disease is becoming a serious health problem in the society. A major complication of CKD is cardiovascular disease secondary to inflammation and accelerated atherosclerosis. In a study done by Sylwia Olechnowicz-Tietz et al [1], demonstrated that moderate to severe renal dysfunction is associated with accelerated atherosclerosis. In this study measurement of CIMT was done by using Doppler ultrasound to demonstrate atherosclerosis in CKD patients and it was found that the mean CIMT of CKD patients was 0.90 ± 0.23 which was significantly higher. Our results were similar to that of kumar et al [2], where CIMT was measured using Doppler ultrasound and was found to be higher in ESRD patients.

In this study Chronic kidney disease patients with high mean Blood pressure were having high CIMT as compared to patients having low mean blood pressure. Similar results were found in the study done by TIWARI, Dharmendra et al [3], that patients with high mean Blood pressure had increased levels of CIMT as compared with patients having low mean Blood pressure.

Our study demonstrated that CIMT is increased in all stages of CKD and there was no significant

difference in CIMT in various stages of CKD. This was in correlation with the study done by Chhajer, Nitesh et al [4] and shoji et al [5], where no significant correlation between eGFR and CIMT was found.

CKD patients with High mean Blood pressure were having higher levels of CIMT as compared to patients with low mean blood pressure. This study demonstrates that systemic hypertension is an independent risk factor of atherosclerosis in patients with non-diabetic chronic kidney disease. This is in correlation with the study done by Kim et al [6], who demonstrated subclinical carotid atherosclerosis in non-diabetic CKD patients and its association with adverse cardiovascular outcomes.

In the present study we have observed high levels of CIMT by using Doppler ultrasound in non-diabetic chronic kidney disease patients. CIMT measurement can be used as an important tool to assess the risk of atherosclerosis leading on to adverse cardiovascular outcomes in Non-diabetic CKD patients.

CONCLUSION

It is concluded in this study that CIMT was found to be increased in non-diabetic CKD patients irrespective of the stage of CKD. Patients with high mean blood pressure had high CIMT values as compared to patients with low mean blood pressure. Patients with dyslipidemia were found to have high levels of CIMT. Risk factors like hypertension and dyslipidemia in CKD patients accelerates atherosclerosis leading to

cardiovascular mortality and morbidity. Risk of Cardiovascular disease in CKD patients increases when the number of risk factors increases. Therefore it is concluded in this study that CIMT measurement using Non-invasive techniques like Doppler ultrasound of carotid arteries is warranted in CKD patients to assess the risk of atherosclerosis and to start early treatment to prevent cardiovascular complications even in the absence of traditional risk factor like Diabetes mellitus.

REFERENCES

- [1]. Olechnowicz-Tietz, S., Gluba, A., Paradowska, A. et al. *Int Urol Nephrol* 45, 2013, 1605.
- [2]. Kumar K S, Lakshmi A Y, Srinivasa Rao P, Das G C, Kumar V S. Carotid intima-media thickness in patients with end-stage renal disease. *Indian J Nephrol* 19, 2009, 13-4
- [3]. TIWARI, Dharmendra et al. Study of Carotid Intima Media Thickness In Patients Of Chronic Kidney Disease. *National Journal of Integrated Research in Medicine*, 6(6), 2018, 11-14,
- [4]. Chhajed N, Subhash Chandra B J, Shetty MS, Shetty C. Correlation of carotid intimal-medial thickness with estimated glomerular filtration rate and cardiovascular risk factors in chronic kidney disease. *Saudi J Kidney Dis Transpl* 25, 2014, 572-6
- [5]. Kim, J. K., Song, Y. R., Kim, M. G., Kim, H. J., & Kim, S. G. Clinical significance of subclinical carotid atherosclerosis and its relationship with echocardiographic parameters in non-diabetic chronic kidney disease patients. *BMC cardiovascular disorders*, 13(1), 2013, 96.
- [6]. Kumar S, et al. Study of Carotid Intimal Medial Thickness in Chronic Kidney Disease at Rural Teaching Hospital. *Ann Med Health Sci Res*. 7, 2017, 76-80

How to cite this article: Mohamed Azeem Sherfudeen, Jagadeesan Mohanan, Prasanna Karthik suthakaran, Chitrabalam Pavadai. Study of carotid intima media thickness in patients of Non diabetic chronic kidney disease. A review. *Int J of Allied Med Sci and Clin Res* 2018; 6(1): 183-186.

Source of Support: Nil. **Conflict of Interest:** None declared.