



ORIGINAL RESEARCH PAPER

General Medicine

PLASMA HOMOCYSTEINE LEVEL IN CHRONIC KIDNEY DISEASE PATIENTS ATTENDING A TERTIARY CARE HOSPITAL IN A SUB URBAN POPULATION

KEY WORDS:

hyperhomocysteinemia , Chronic kidney disease , homocysteinemia

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ABSTRACT

Chronic kidney disease (CKD) is a very common condition result of different etiologies. There are reports in the literature indicating that chronic kidney disease leads to hyperhomocysteinemia which contributes to increased cardiovascular morbidity and mortalities. Reduction of homocysteine level may help to decrease the cardiovascular morbidity and mortality which are leading cause of death in chronic kidney disease patients. 50 patients were screened with chronic kidney disease , 37 were males 13 were females . 34 patients were in age range of 41-60 . 36 patients were in stage 5 CKD , 11 were in stage 4 CKD , 3 were in stage 3 CKD . Hyperhomocysteinemia was observed in 78 % of CKD patients . 94.87% had mild hyperhomocysteinemia . End stage renal disease patients had increased prevalence of hyperhomocysteinemia. There was not much difference in hyperhomocysteinemia in patients who are on dialysis and who are not on dialysis. This studied showed that hyperhomocysteinemia is highly prevalent in CKD patients.

INTRODUCTION

Chronic kidney disease is a common age related and risk factor associated morbidity affecting lot of people where there is gradual reduction in functioning mass of kidney due to loss of nephrons that results in decreased xcretion of metabolic waste products from the body and their accumulation in the body leading to constellation of symptoms.^{1,7}

Chronic kidney disease predisposes to number of systemic abnormalities. One of the leading causes of morbidity and mortality in chronic kidney disease patients is cardiovascular system involvement. A number of causes have been postulated to increase susceptibility for cardiac diseases and death due to Cardiac diseases in chronic kidney disease affected persons^{8,2}.

Studies have shown homocysteine was found to be a significant risk factor premature atherosclerosis and thrombus formation³. It was calculated that 10% of all Coronary heart disease (CAD) risk in population was due to elevated homocysteine.⁴ It was observed that a 30-40% reduction in risk of CAD by long term lowering of homocysteine level by 3-4 umol/lit¹⁰ Hyperhomocysteinemia results from number of causes major causes for hyperhomo cysteinemia in CKD are decreased excretion of homocysteine by diseased kidney and altered metabolism of homocysteine in uremic mileu. Many studies have shown significant association and negative correlation between decrease in Glomerular filtration rate and increase in homocysteine level⁵.

Many studies are ongoing to find out whether decreasing homocysteine in CKD patients will decrease cardiovascular⁵ morbidity and mortality. So in this study an attempt is made to find out association and correlation between decreased renal function and an increase in homocysteine level

Need for the study:

It highlights the importance of delivery of early management of chronic kidney disease gives a good prognosis. And also a scarcity of studies on homocysteine levels and its affect in chronic kidney disease in people from suburban populations in India.

Aims & Objectives of the study

1. To study homocysteine level in patients with chronic kidney disease
2. To study the association and correlation between the decrease in renal function and increase in homocysteine level in chronic kidney disease patients.

Materials And Methods: This was a cross-sectional study. After getting necessary permission, 50 patient's presented in OPD with chronic kidney disease were observed and homocysteine levels were checked. For statistical convenience people were divided into diagnostic group. Statistical analysis was done using SPSS24.

RESULTS:

Most of the patients belonged to age group 41 – 64 years. Majority of patients belonged to male gender 37 (74 %) remaining were 13 (26%) females

Table I – Staging of CKD according to creatinine clearance and glomerular filtration rate as calculated by cockcroft gault formula. It was observed Of the patients selected majority of patients in CKD stage 4 and 5 constituting around 94 percentage

Table II- Hyperhomocysteinemia levels . Of the 50 patients in the study 39 patients found to be having elevated plasma Homocysteine values constituting around 78%

Table III- Stage of CKD and elevated homocysteine level. If we compare plasma homocysteine level with corresponding glomerular filtration rate and stage of CKD it shows that as patient deteriorates to next lower level of chronic kidney disease incidence of hyperhomocysteinemia increases. Here in this study we observed that in stage 4 and stage 5 of chronic kidney disease incidence of hyperhomocysteinemia were 72% and 96.67 percentage respectively.

Table - 1 Staging Of Ckd According To Creatinine Clearance And Glomerular Filtration Rate As Calculated By Cockcroft Gault Formula :

| Stage of CKD | Number of patients | Percentage |
|--------------|--------------------|------------|
| 0 | 0 | 0 |

| | | |
|---|----|----|
| 1 | 0 | 0 |
| 2 | 0 | 0 |
| 3 | 3 | 6 |
| 4 | 11 | 22 |
| 5 | 36 | 72 |

Table – 2 -hyperhomocysteinemia:

| Sex | Total number | Normal HCY | Hyper HCY | Percentage hyper HCY |
|--------|--------------|------------|-----------|----------------------|
| Males | 37 | 9 | 28 | 75% |
| Female | 13 | 2 | 11 | 84% |

Table 3 – Stage Of Ckd And Elevated Homocysteine Level:

| Stage of CKD | No of patients | Normal HCY | Hyperhomo Cystenemia | Percentage of hyperhomocysteinemia |
|--------------|----------------|------------|----------------------|------------------------------------|
| 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 0 | 0 |
| 3 | 3 | 1 | 2 | 66.6% |
| 4 | 11 | 3 | 8 | 72.72% |
| 5 | 36 | 7 | 29 | 80.55% |

DISCUSSION:

The study population included data of 50 patients who presented in OP with chronic kidney disease . Majority of patients belonged to male gender 37 (74 %) remaining were 13 (26%) females .most of the patients belonged to age group 41 – 64 years). In this study we found that 78% of CKD patients were having hyperhomocysteinemia and hyperhomocysteinemia was more prevalent as stages of CKD increases . Even though our study sample size was smaller we found that hyperhomocysteinemia was more prevalent in later stages of CKD. It was in accordance with the concept that as renal function deteriorates the homocysteine excretion decreases and its level increases in plasma. So its worthy to take measures to decrease homocysteine levels in patients with CKD. This study highlights the importance of delivery of early management of chronic kidney gives good prognosis.

Limitations:

1. Small sample size
2. Study period was very short .

CONCLUSION:

The incidence of chronic kidney disease is much higher in males than in females. Hyperhomocysteinemia was observed in 78 % of patients with CKD Prevalence of hyperhomocysteinemia was more in End stages of CKD (stage 3 & 4 & 5) .The study highlights the importance of delivery of early management of chronic kidney disease gives good prognosis.

REFERENCES:

1. Kailash Prasad. Homocysteine, a risk factor for cardiovascular disease. International Journal of Angiology 1999;8:76-86.
2. Malinow MR, Bostom AG, Krauss RM. homocysteine, diet, and cardiovascular diseases, a statement for health care professionals from the nutritional committee,
3. Bostom AG, Silbershatz H, Rosenberg IH, Selhub J, D'Agostino RB, Wolf PA, Jacques PF, Wilson PWF: Nonfasting plasma total homocysteine levels and all-cause and cardiovascular disease mortality in elderly Framingham men and women. Arch Intern Med 159: 1077–1080, 1999
4. Eikelboom JW, Lonn E, Genest J, Hankey G, Yusuf S: Homocyst(e)ine and cardiovascular disease: A critical review of the epidemiologic evidence. Ann Intern Med 131: 363–375, 1999
5. Moustapha A, Naso A, Nahlawi M, Gupta A, Arheart KL, Jacobsen DW, Robinson K, Dennis VW: Prospective study of hyperhomocysteinemia as an adverse cardiovascular risk factor in end-stage renal disease. Circulation 97: 138–141, 1998
6. Bostom AG, Culleton BF: Hyperhomocysteinemia in chronic renal disease. J Am Soc Nephrol 10: 891–900, 1999
7. Foley RN, Parfrey PS, Sarnak MJ: Clinical epidemiology of cardiovascular disease in chronic renal disease. Am J Kidney Dis 19. [Suppl 3]:S112–S119, 1998
8. Sarnak MJ, Levey AS: Cardiovascular disease and chronic renal disease: A new paradigm. Am J Kidney Dis 35[Suppl 4]:S117–S131, 2000
9. Bostom AG, Gohh RY, Morrissey P: Hyperhomocysteinemia
- 10 Guttormsen AB, Ueland PM, Svarstad E, Refsum H: Kinetic basis of hyperhomocysteinemia in patients with chronic renal failure. Kidney Int 52: 495–502, 1997