Original Research Article

Gastrointestinal complications in patients with Chronic Kidney Disease

Madhu Naveen Reddy[1], Satya Prateek[2], Krosuri Meghana[3*], Samala Vishnu Kumar[4]

[1,2]Assistant Professor, [3,4]Post Graduate
Department of General Medicine, Malla Reddy Institute of Medical Sciences, Hyderabad, Telangana, India
[*]Corresponding author email: **krosuri.meghana@gmail.com**

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Abstract

Background: The most common, non –renal, chronic disorder in patients with ESRD is gastro intestinal disorders, accompanying ESRD including those receiving renal replacement therapy. Among upper gastrointestinal lesions caused by chronic kidney disease- gastritis, esophagitis, gastric ulcer are the most prevalent lesions. Here an attempt is being made to study the upper gastro intestinal changes in chronic kidney disease and evaluate their relationship with the stage of CKD or GFR.

Materials and methods: A cross sectional study on 50 patients of, who were diagnosed to have chronic kidney disease and being presented to OPD and admission in Malla Reddy Institute of Medical Sciences, Suraram over a period of one year. All patients with chronic kidney disease who underwent upper gastrointestinal endoscopy were included in the study.

Results: 50 patients were included in the study with mean age and males 28 and 22 females. Among 50 patients 42 patients manifested with upper gastrointestinal lesion among them erosive gastritis 13(26%) was most common upper gastrointestinal lesion followed by gastro esophageal reflux disease with or without duodenitis 8 (16%), duodenal ulcer, gastric ulcer 4(8%) each, pangastritis 3(6%), GERD with gastritis, erosive duodenitis, erosive esophagitis, pale gastric mucosa 2(4%) each, angiodysplasia and hiatus hernia 1(2%) each.

Conclusion: Majority of the patients with chronic kidney disease have upper gastrointestinal involvement on endoscopic evaluation. Erosive gastritis is the most common lesion Esophageal and duodenal involvement is less common than the gastric lesions. Upper gastrointestinal findings are frequently observed in chronic kidney disease patients on dialysis. Early diagnosis and management

of these upper gastrointestinal lesions in CKD can reduce mortality and morbidity and prevent fatal complication like massive upper gastrointestinal bleed.

Key words

Chronic Kidney Disease, Gastrointestinal, Complications.

Introduction

Chronic kidney disease is a silent epidemic of the 21 century. Surveys have suggested that as many as 16% of the adult population have CKD [1]. Its occurrence is universal. Every year over one lakh people in India are diagnosed with CKD necessitating dialysis or kidney transplant. Patients with end stage renal disease often suffer from co-morbidities like diabetes and cardiovascular disease. The most common, non–renal, chronic disorder in patients with ESRD are gastrointestinal disorders [2], accompanying ESRD including those receiving renal replacement therapy.

Chronic kidney disease encompasses a spectrum of different pathophysiological process associated with abnormal kidney function and a progressive decline in glomerular filtration rate. A recently updated classification stages chronic kidney disease, on the basis of Glomerular filtration rate and albuminuria, in order to predict the progression of the disease.

CKD is a clinical syndrome due to irreversible renal dysfunction leading to excretory, metabolic and synthetic failure culminating in to accumulation of non-protein nitrogenous substances and present with various clinical manifestations.

ESRD is described as a terminal stage of CKD that without replacement therapy would result in death. Despite various etiology, CKD is the final common pathway of irreversible destruction of nephrons ultimately resulting in alteration of "Milieuinterior" that affects every system in the body. One such system in the body is Gastrointestinal System.

Gastrointestinal Symptoms are common in Chronic Kidney disease [3]. Patients although the type of symptoms also vary considerably in different geographical regions. Gastrointestinal symptoms also vary in relation to serum creatinine and glomerular filtration rate. With increase in serum creatinine [1] and decrease in GFR, gastrointestinal symptoms like anorexia, nausea, vomiting, hiccups, epigastric pain, regurgitation, dyspepsia, heart burn, Dysphagia, hematemesis, duodenal ulcer, angiodysplasia, esophagitis, gastric erosion, hiatus hernia.

Among upper gastrointestinal lesions caused by chronic kidney disease gastritis, esophagitis, gastric ulcer are the most prevalent lesions. Upper GI bleed is reported to cause death in 3 to 7% in CKD patients [1]. These lesions are more common in advance stage of CKD. These lesions are more common in advanced stage of CKD. The symptoms due to these lesions can markedly affect the quality of life.

Various studies have been conducted on relation between gastro intestinal lesions and CKD is 76%. A prevalence of 72.9% was found by Serme, et al. [4] in Burkina Faso and in Italy it was 74% accordingly to Nardone, et al. [5]. Upper gastro intestinal lesions in our series had predominant localization in gastric and duodenal level.

Several studies have identified and recognized that early diagnosis and management of these upper gastrointestinal lesions reduce mortality and morbidity in CKD patients.

Here an attempt is being made to study the upper gastrointestinal changes in chronic kidney disease and evaluate their relationship with the stage of CKD or GFR.

Materials and methods

Source of data: Patients with chronic kidney disease presented to In-patient and OPD of department of General Medicine, Malla Reddy Institute of Medical Sciences.

Study design: Cross sectional study.

Study period: One year

Sample size: The present study was conducted on 50 patients of, who were diagnosed to have CKD and being presented to OPD and admission in Malla Reddy Hospital during the period of one year.

Procedure

All eligible cases were studied during this period, which fit in for inclusion criteria. All patients who were admitted for CKD related complaints with age group >18 years were taken in the study. Detailed history, physical examination and investigations were recorded in the pretested proforma. These samples were selected by using simple random sampling method. Statistical parameters correlation was used for analysis. Informed consent was obtained from all patients.

Inclusion criteria

- Adult Patients diagnosed to have chronic kidney disease and age more than 18 years.

Exclusion criteria

- Patients with history of Acid Peptic Disease.
- Patients on high dose NSAIDs for a long duration of time.
- Patients of cirrhosis of liver with oesophageal varices.
- Patients with history chronic alcoholism, chronic smoking and chronic tobacco chewing.
- Patients diagnosed with AKI.

Criteria for diagnosing chronic kidney disease

- Symptoms of uremia for 3 months or more.
- Elevated blood urea, serum creatinine and decreased creatinine clearance
- Ultrasound evidence of CKD
- Bilateral contracted kidney – size less than 8 cm in male and size less than 7 cm in female
- Poor corticomedullary differentiation
- Type 2 or 3 renal parenchymal changes

Supportive laboratory evidence of CKD like anemia, low specific gravity, changes in serum electrolytes etc. Detailed clinical history and clinical examination was undertaken with preference to gastrointestinal related complaints and renal diseases. Investigation included hemoglobin, total count, ESR, RBS, Blood urea, serum creatinine, Serum electrolytes, Urine analysis, ECG.

After selecting the patients fulfilling the above criteria were evaluated for upper gastrointestinal manifestations using Olympus which is fibro optic esophagio gastro duodenal endoscopy. Procedure was performed under moderate sedation, a practice that was formerly referred to as “conscious sedation”. After the procedure the patients were observed and monitored by a qualified individual in the endoscopy room or a recovery area until a significant portion of the medication warn off if used during procedure. Occasionally patient left with a mild sore throat, which may respond to saline gargles or chamomile tea. It may last for weeks or not happen at all. Patient who underwent endoscopy under sedation should send with another person to home not alone.

Interpretation of endoscopy findings

- Esohagitis – Abnormal erythema, exudation, erosion in esophagus
- Gastritis – Significant erythema, friability, exudation, erosions, edema, nodularity exist in gastric mucosa.
- Duodenitis – Erythema, petechiae, erosions
- Peptic ulcer – Break in the mucosa was > 0.5 cm
- Hiatus hernia – Gastric mucosa observed >3 cm above the

Results

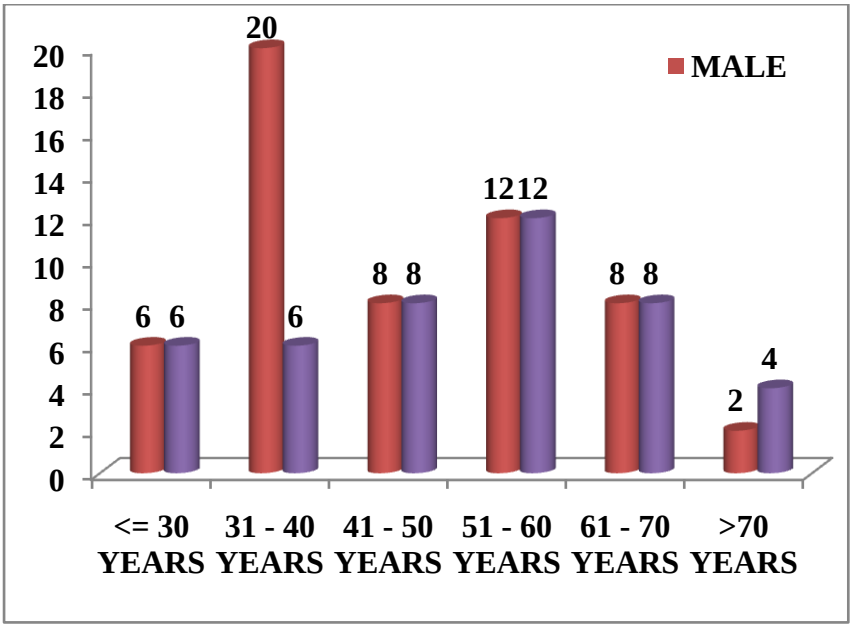
A total number of 50 cases were studied over a period of one year. The majority of patients 13 (26%) belonging to 31-40 years age group of whom 10 were males (**Graph – 1**).

Out of the 50 patients males were 28 and females were 22. About 42 patients, out of the 50, have upper gastrointestinal involvement on endoscopic examination. Remaining 8 patients have normal upper gastrointestinal mucosa (**Graph – 2**).

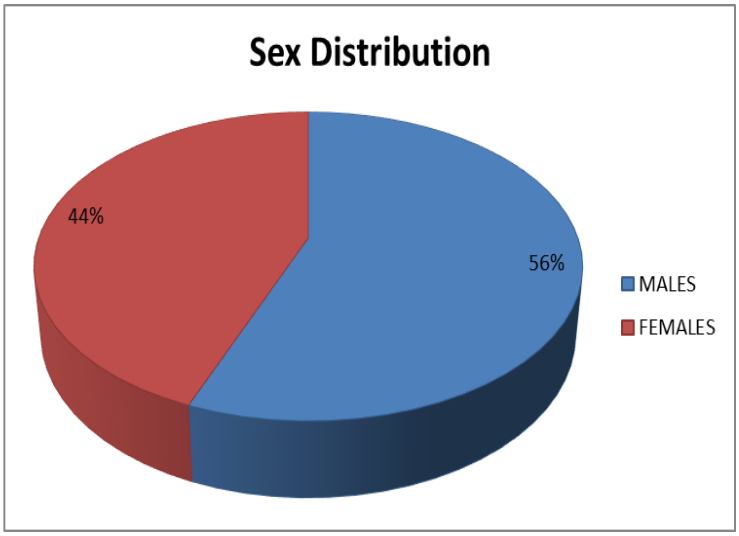
Majority i.e. 22 (44%) were in stage IV, followed by 15(30%) were in stage V, 11(22%) were in stage III, 2 (4%) were in stage II and no patient in stage I (**Graph – 3**).

Most common upper gastrointestinal lesion in our study was erosive gastritis 13 (26%) followed by gastro esophageal reflux disease with or without duodenitis. 8 (16%), duodenal ulcer, gastric ulcer 4 (8%) each, pangastritis 3 (6%), GERD with gastritis, erosive duodenitis, erosive esophagitis, pale gastric mucosa 2 (4%) each, angiodysplasia and hiatus hernia 1 (2%) each (**Graph - 4**).

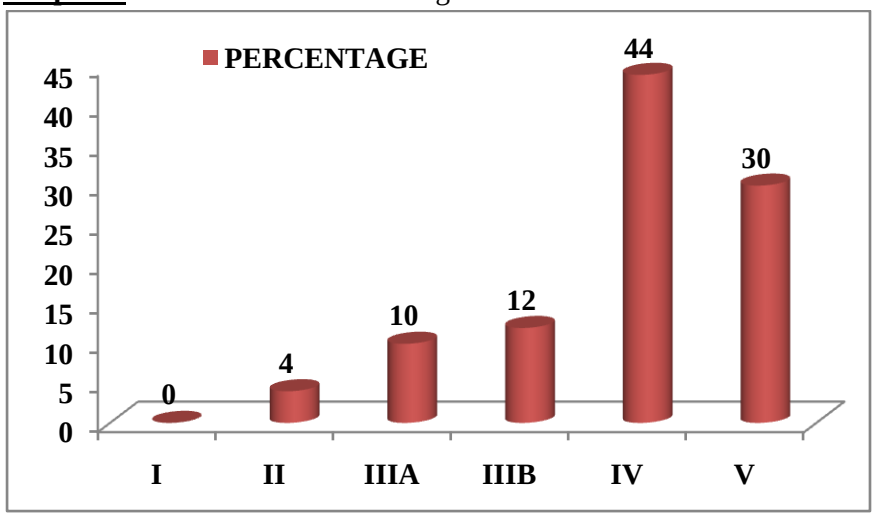
Graph - 1: Distribution of age.



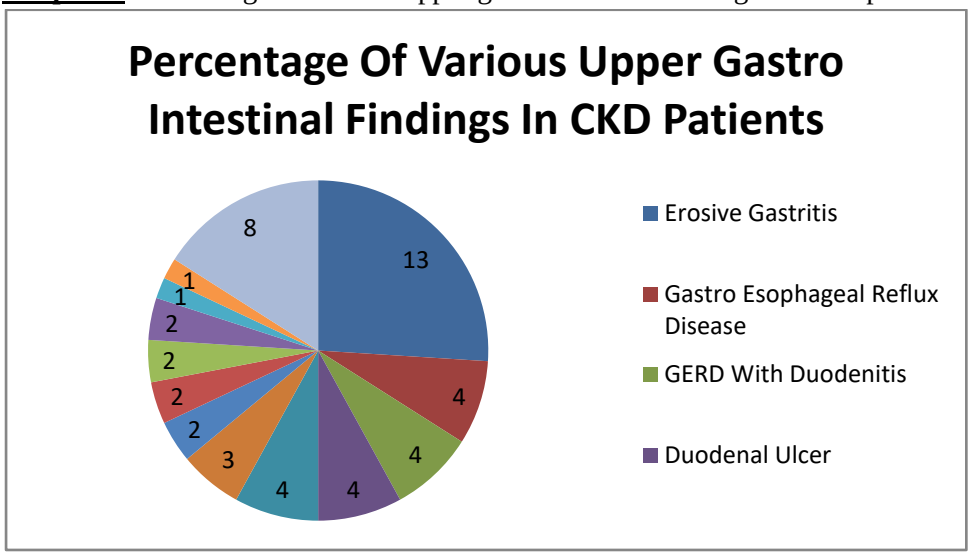
Graph - 2: Sex distribution.



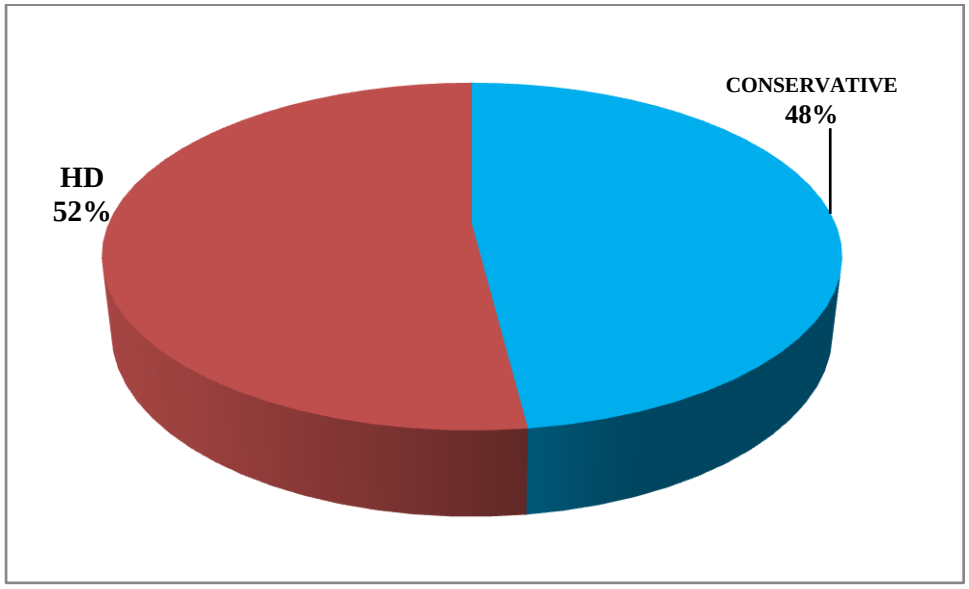
Graph - 3: Distribution based on stage.



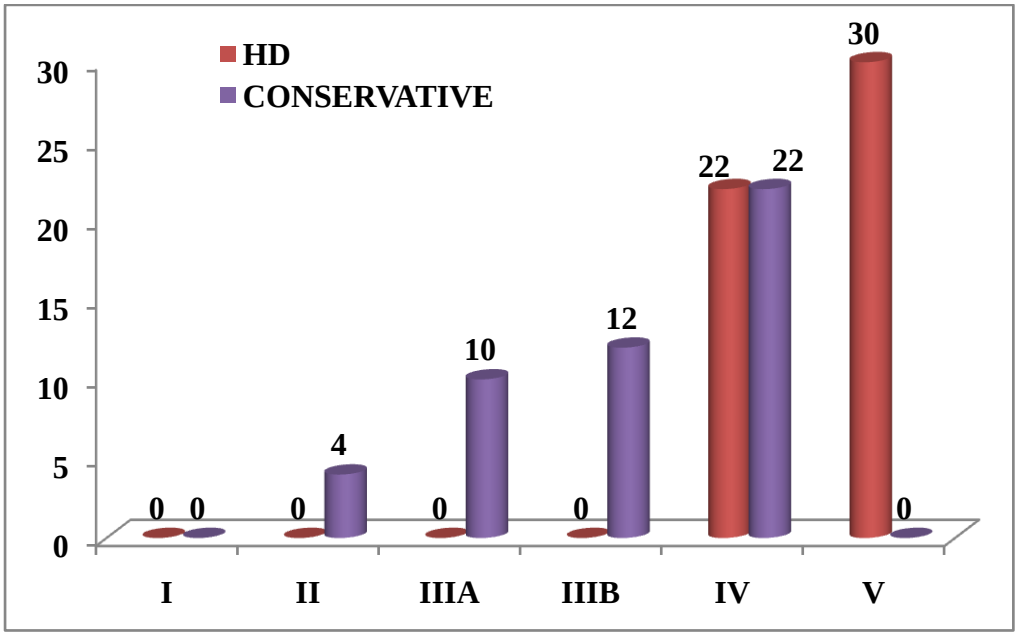
Graph - 4: Percentage of various upper gastrointestinal findings in CKD patients.



Graph - 5: Distribution of patients based on mode of treatment.



Graph - 6: Distribution of stage of CKD based on mode of treatment.



Among upper GI lesions frequency of involvement of stomach 23 (46%) were more, followed by esophagus 11(22%), followed by 8 (16%)

Among patients with upper gastrointestinal involvement 42 (84%) majority is involved in stomach 23(55%) among them 12(29%) were males and 11(26%) were females followed by esophagus 11(26%), 7(17%) were males and 4(10%) were females followed by duodenum 8(19%) both males and females were equal 4(10%).

Stomach has 23(55%) among them stage IV 11(26%), 8(19%) stage V, 4(10%) stage III. Esophagus has 11(26%) among them 5(12%) were in stage IV, 4(10%) in stage V, 2(4%) were in stage III. Duodenum has 8(19%) among them 5(12%) were in stage IV, 3(7%) were in stage IV.

Out of 50 patients 26(52%) were on hemodialysis among them 11(22%) were males and 15(30%) were females. Patients on conservative management were 24(48%) among them 17(34%) were males and 7(14%) were females (**Graph – 5**).

Among 26(52%) patients who were on hemodialys was 15(30%) were females and 11(22%) were males. Among 24(48%) patients who were on conservative management 17(34%) were males and 7(14%) were males.

Among upper gastrointestinal lesion patients on haemodialys is majority is involved in stomach 13(31%) followed by esophagus 7(16.67%) and duodenum 5(12%). Among patients on conservative management 10 (24%) involved in stomach, 4(9.52%) esophagus and 3(7%) in duodenum.

Patients with stage V 15(30%) are majority on hemodialysis followed by stage IV 11(22%). Patients with stage IV 11(22%) and Stage III 11(22%) are majority on conservative management followed by 2(4%) in stage II (**Graph – 6**).

Discussion

In this study, a total number of 50 patients with chronic kidney disease presented to OPD or admitted in Malla Reddy Hospital were taken and were evaluated for upper gastrointestinal manifestations with reference to upper gastrointestinal endoscopy taking into consideration age, sex, stage of CKD (based on

Cockcroft-gault equation) treatment modality that is being used in these cases.

This study highlights the high prevalence of upper gastrointestinal endoscopic lesions in patients with chronic kidney disease 42(84%), a prevalence of 72.9% was found by Serme, et al. [4] in Burkinia Faso and in Italy it was 74% according to Nardone, et al. [5], a study done by Mohit Goyal, et al. [1] 86% shows upper gastrointestinal lesions, Khedmat [6] in 2007 observed that 79% chronic kidney disease patients had upper gastrointestinal lesion, Al Muelio [7] in his study on 54 patients on chronic hemodialysis found that endoscopic findings were abnormal in 49(90.7%) patients.

In this study the age of patients ranged from 19 to >70 years, Mean age of the patient with gastrointestinal lesions is 45. In a study conducted by Varma, et al. [8], the age of patients ranged from 17 to 70 years. In other study, Sreelatha et al. [9] age of patients were between 14 to 80 years. In another study by Esfahani [10] age of patients were between 4 to 18 years.

Among symptoms anorexia 42% most common followed by vomiting 32%, nausea 24%, dyspepsia 16%, in a study done by cisse Mouhamadou Moustapha [11] vomiting 84% most common symptom followed by anorexia 32%, nausea 48%.

A number of male patients 28(56%) are more than female patients 22(44%), in this study out of 50 patients 42(84%) developed upper gastrointestinal lesions of which males more than females. In a study conducted by Varma, et al. [8] out of 92 patients 72% developed upper gastrointestinal lesions. In another study conducted by Sreelatha, et al. [9] out of 50 patients 34% has upper gastrointestinal lesions. In a study of upper gastrointestinal endoscopic evaluation in chronic kidney disease by Agarwal, et al. [12] out of 70 patients 95.7% patients showed upper gastrointestinal involvement.

In this study the patients with mixed lesions are compared with isolated lesions involving esophagus, stomach, duodenum alone. Mixed lesions include GERD with duodenitis/ esophagitis/ pangastritis. Y Kawaguchi, et al. [13] 156 (34%) on hemodialysis presented with GERD, the prevalence of GERD tends to increase as renal function worsens.

Among the isolated lesions erosive gastritis constitutes a majority of cases either antral or fundal gastritis, among them males more than females. Gastric involvement in various forms (erosive gastritis, gastric ulcer) constitutes the majority of upper gastrointestinal findings 23(55%) in this study when compared to esophagus 11(26%) and duodenum 8(19%).

In a study conducted by Varma, et al. [8] gastritis was the major lesion 27% other lesions duodenitis 14%, gastroduodenitis 20% and peptic ulcer 6.5%. In a study conducted by Sreelatha, et al. [9] erosive gastritis was the major lesion 16%, stomach involves 48% followed by esophagus 29% and duodenum 23%. In the study by Esfahani [10] gastritis was predominant 60.8% followed by duodenitis13%, gastroduodenitis 7.2%.

In a study conducted by Agarwal, et al. [12] uremic gastropathy was found in 91.4%, esophagus involvement 63% duodenum involvement In Mouhamad, et al. [14] gastritis is 49% most common lesion, hiatal hernia 20%, peptic esophagitis 16% duodenal bulbitis 14%.

In a study conducted by Nardone, et al. [5] 56% of patients has gastric lesions, 18% has esophagitis and 36% has duodenitis. In a study conducted by Mohit Goyal [1] gastritis is most frequent lesion in patients with CKD 68% followed by esophagitis 42%, followed by duodenitis 8%. In a study done by Al Mueilo [7] 57% gastritis, 9.3% duodenitis. In a study conducted by Margolis, et al. [15] duodenitis is most frequent lesion 60% followed by gastric 22%. Erosive gastritis 32% most common gastrointestinal lesion in a study done by Nand, et

al. [2]. Elevated gastrin levels, Helicobacter Pylori, infection, toxic effects of urea and other toxic molecules on gastric mucosa are thought to be responsible for erosive gastritis.

Most of the patients in our study belong to stage IV (44%), among them males are 13(26%) and females are 9(18%) of which 11(26%) are stomach involvement and each 5(12%) involvement in esophagus and duodenum have upper gastro intestinal involvement, followed by stage V 15(30%) with females 8(16%) and males 7(14%) of which 8(19%) stomach manifestations 4(10%) in esophagus and 3(7%) in duodenum, followed by stage III 11(22%) males 6(12%) and females 5(10%) of which 4(10%) are stomach involvement, 2(4%) in esophagus no manifestations in duodenum followed by stage II 2(4%) both are males, no patient with stage I has no upper gastrointestinal manifestations. In a study conducted by Sreelatha, et al. [9] out of 50 patients 60% belong to stage V of which 42% have upper gastrointestinal involvement. In a study conducted by Cisse Mouhamadou Moustapha, et al. [11] the degree of chronic kidney disease was not correlated with occurrence of gastric lesion. However, the influence of the degree of chronic kidney disease on the occurrence of gastritis is variously appreciated. Stolic [16] did not find association in patients with severe stages of chronic kidney disease. Endoscopic lesions most common in patients with stage V more than stage IV in a study done by Mohit Goyal [1].

Among 50 patients 24(48%) are conservative treatment and 26(52%) are on hemodialysis. The majority of patients in this study are being offered hemodialysis as treatment modality. Out of 26 patients on hemodialysis 25(60%) has upper gastrointestinal lesion, which could be either uremia per se or due to usage of heparin in hemodialysis, most common lesions in stomach 13(31%), esophagus 7(16.67) duodenum 5(12%). Out of 24 patients on conservative treatment most common lesion in stomach 10(24%), esophagus 4(9.52%), duodenum 3(7%).

In a study done by Esfahani [10], it was quoted that duration of dialysis did not have any influence on prevalence of gastrointestinal lesions. In this study, only 12% (6 patients) are treated with CAPD and all these have upper gastrointestinal lesions. Out of 18 patients in this study 11 patients have positive endoscopic findings.

Conclusion

Gastrointestinal symptoms are common in chronic kidney disease patients and constitute an important cause of seeking medical care in these patients. Majority of the patients with chronic kidney disease have upper gastrointestinal involvement on endoscopic evaluation. Erosive gastritis is the most common lesion Esophageal and duodenal involvement is less common than the gastric lesions. Patient with chronic kidney disease stage IV showed predominant upper gastrointestinal lesions than stage V in our study. Upper gastrointestinal findings are frequently observed in chronic kidney disease patients on dialysis. Early diagnosis and management of these upper gastrointestinal lesions in CKD can reduce mortality and morbidity and prevent fatal complication like massive upper gastrointestinal bleed.

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