

Gastrointestinal Manifestations in Patients with Chronic Kidney Disease

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Abstract

Background: Chronic kidney disease is a silent epidemic of the 21 century. Surveys have suggested that as many as 16% of the adult population have CKD1. The most common, non –renal, chronic disorders in patients with ESRD are gastro intestinal disorders2. Among upper gastrointestinal lesions caused by chronic kidney disease gastritis, an esophagus is, gastric ulcers 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. **Objectives:** 1. To determine the prevalence of various upper gastro intestinal lesions with the use of fibro optic endoscopy. 2. To evaluate the relation between the gastro intestinal lesion with the stage of CKD or GFR. **Subjects and Methods:** We conducted a cross sectional study on 50 patients ,who are diagnosed to have Chronic kidney disease and being presented to OPD and admission in Navodaya Medical College and Research Center, Raichur over a period of one year. All patients with chronic kidney disease underwent upper gastrointestinal endoscopy were included in the study. **Results:** Majority of the subjects belongs to age group of 31 to 40 years (26%) and least belongs to 70 to 80 years age group (6%). Out of the 50 subjects, males were 28 and females were 22. Majority of the cases in our study belonged to stage IV. 84% of the cases had upper gastrointestinal involvement on endoscopic examination in our study. Erosive gastritis (26%), either antral or fundal, was the predominant lesion found on endoscopy. Majority of the subjects having erosive gastritis, had stage IV CKD (53.8%). Out of 50 cases in our study 55% of subjects had lesions of the stomach, 26% of subjects had lesions in the duodenum, 19% of subjects had lesions in esophagus. Out of 50 subjects in our study 52% were undergoing haemodialysis and 48% of subjects were under conservative management. Majority of subjects undergoing haemodialysis were belongs to stage V. **Conclusion:** Majority of the patients with chronic kidney disease have upper gastrointestinal involvement on endoscopic evaluation. Erosive gastritis is the most common upper gastrointestinal manifestation in our study. Upper gastrointestinal manifestations are predominant in stage V. Upper gastrointestinal findings are frequently observed in chronic kidney disease patients on dialysis. Early diagnosis and management can reduce mortality and morbidity and prevent fatal complication like massive upper gastrointestinal bleed.

Keywords: Chronic kidney disease, Upper gastrointestinal manifestations, Erosive gastritis.

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Introduction

Chronic kidney disease is a silent epidemic of the 21 century. Surveys have showed 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 disorders in patients with ESRD are gastro intestinal disorders.^[2]

Chronic kidney disease encompasses a spectrum of different patho physiological process associated with abnormal kidney function and a progressive decline in glomerular filtration rate. A recently updated classification, in which stages of chronic kidney disease are stratified by both estimated GFR and degree of 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 “Milieu interior” that affects every system in the body. One such system in the body is Gastro Intestinal System. Gastro Intestinal Symptoms are common in Chronic Kidney disease³ patients

Although the type of symptoms also vary considerably in different geographical regions. Gastro intestinal symptoms also vary in relation to serum creatinine and glomerular filtration rate. With increase in serum creatinine and decrease in GFR gastro intestinal symptoms like anorexia,

nausea, vomiting, hiccups, epigastric pain regurgitation, dyspepsia, heart burn, Dysphagia, haematemesis, duodenal ulcer, angiodysplasia, esophagitis, gastric erosion, hiatus hernia are common manifestations.

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. 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 gastrointestinal lesions and CKD patients. A prevalence of 72.9% was found by Serme4 et al in Burkina Faso and in Italy it was 74% accordingly to Nardone5 et al. Upper gastrointestinal 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.

Objectives of the Study

1. To determine the prevalence of various upper gastrointestinal lesions with the use of fiberoptic endoscopy.
2. To evaluate the relation between the gastrointestinal lesion with the stage of CKD or GFR.

Subjects and Methods

Source of Data

Patients presenting to outpatient and inpatient department, Department of General Medicine, Navodaya Medical College and Research center, Raichur.

Study design: Cross sectional study.

Study period: One year

Sample Size

A total of 50 subjects diagnosed to have chronic kidney disease, presented to outpatient department or were admitted to Navodaya medical college and research center, fulfilling inclusion criteria were included in this study.

Inclusion criteria

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

Exclusion criteria

1. Patients with history of Acid Peptic Disease.
2. Patients on high dose NSAIDs for a long duration of time
3. Patients of cirrhosis of liver with esophageal varices.
4. Patients with history chronic alcoholism, chronic smoking and chronic tobacco chewing
5. Patients diagnosed with AKI

Criteria for diagnosing chronic kidney disease

1. Symptoms of uremia for 3 months or more.
2. Elevated blood urea, serum creatinine and decreased creatinine clearance
3. Ultrasound evidence of CKD

- a. Bilateral contracted kidney –size less than 8cm in male and size less than 7 cm in female
- b. Poor cortico medullary differentiation
- c. Type 2 or 3 renal parenchyma changes Supportive laboratory evidence of CKD like anemia, low specific gravity, changes in serum electrolytes etc.

Staging of chronic kidney disease is based on Glomerular filtration rate. Cockcroft-Gault formula was used to calculate the glomerular filtration rate. Detailed clinical history and clinical examination is undertaken with preference to gastrointestinal related complaints and renal diseases. The following investigations were performed.

1. Hemoglobin, total count, ESR
2. RBS
3. Blood urea, serum creatinine
4. Serum electrolytes
5. Urine analysis
6. ECG

After selecting the patients fulfilling the above criteria, they were subject to upper gastrointestinal endoscopy at our institute, using flexible fiberoptic endoscope, manufactured by Olympus Inc.

Results

A total number of 50 cases were studied over a period of one year. Various parameters such as GFR was calculated and tabulated along with findings of upper gastrointestinal endoscopy. These parameters were later analyzed using the SPSS v16.0 software at the Department of Social and Preventive Medicine, Navodaya Medical College, Raichur. There are 6 subjects in our study ranging from 19 to 30 years age group, 13 subjects ranging from 31 to 40 years, 8 subjects ranging from 41 to 50 years, 12 subjects ranging from 51 to 60 years, 8 subjects ranging from 61 to 70 years, 3 subjects ranging from 71 to 80 years. Majority of the subjects belong to age group of 31 to 40 years 26% and least belong to 70 to 80 years age group 6%.

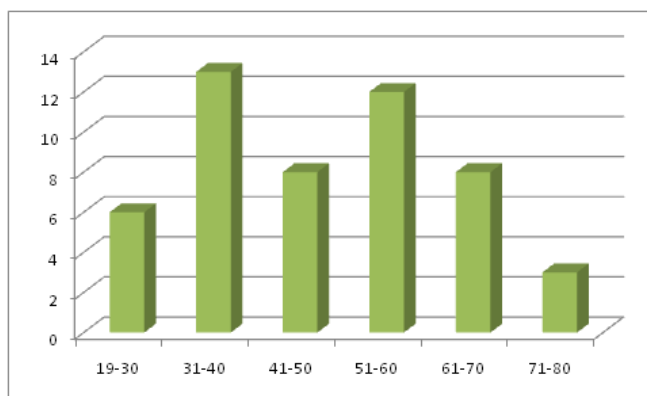


Chart1: Age wise distribution of the sample size.

Out of the 50 patients males were 28 and females were 22. 42 patients, out of the 50, had upper gastrointestinal involvement on endoscopic examination. Remaining 8 patients had normal upper gastrointestinal mucosa.

Distribution of Patients Based On Stage

Out of 50 cases of chronic kidney disease subjects 4%

belongs to stage II ,22% subjects belongs to stage III, 44% subjects belongs to stage IV ,30% subjects belongs to stage V.

Majority of the cases in our study belongs to stage IV and no patients were there in stage I.

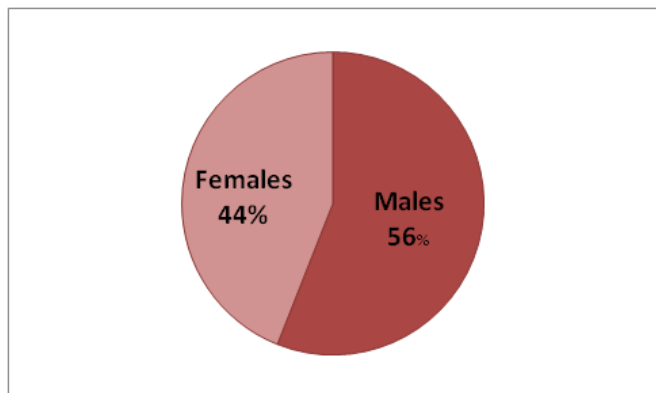


Chart2: Sex wise distribution of the sample size.

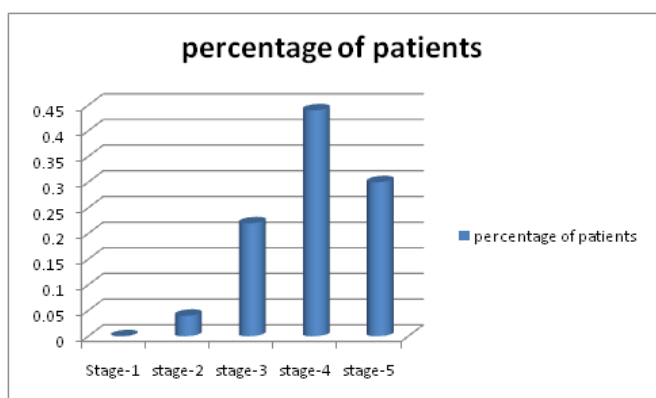


Chart3: Sex wise distribution of the sample size.

Table 1: Percentage of Various Upper Gastro Intestinal Findings in CKD Patients.

Type of lesion	Number of patient	Percentage
Erosive Gastritis	13	26%
GERD With or without Duodenitis	10	20%
Duodenal Ulcer	4	8%
Gastric Ulcer	4	8%
Pan Gastritis	3	6%
GERD With Gastritis	2	4%
Erosive Esophagitis	2	4%
Pale Gastric Mucosa	2	4%
Angiodysplasia Of Stomach	1	2%
Hiatus Hernia	1	2%
Normal Study	8	16 %

Out of 50 subjects, 42(84%) had upper gastrointestinal involvement on endoscopic examination. Most common upper gastrointestinal lesion in our study is erosive gastritis 13(26%), followed by gastro esophageal reflux disease with or without Duodenitis. 10 (20%), duodenal ulcer, gastric ulcer 4(8%) each, pan gastritis 3(6%),GERD with gastritis, erosive esophagitis, pale gastric mucosa 2(4%) each, angiodysplasia and hiatus hernia 1(2%) each.16% Of chronic kidney disease subjects had no abnormalities in endoscopic examination.

Upper Gastrointestinal Manifestations Based On CKD Stage

Erosive gastritis 26%, either antral or fundal, was the predominant lesion found on endoscopy of whom 15% Of subjects belong to stage III,53.8% of subjects belongs to stage IV ,30.7% of subjects belong to stage V . GERD with or without Duodenitis 16% was next of whom 10%of subjects belongs to stage III, 60% of subjects belongs to stage IV, 30% of subjects belongs to stage V. Duodenal ulcers 8% of whom 50% each in stage IV and stage V. Gastric ulcers were seen in 8% of the subjects of whom 25% each in stage III and stage V, 50% of subjects were there in satge IV. Pan gastritis involving entire stomach is seen in 6% of whom 66.6% of subjects belong to stage IV, 33.3% of subjects belongs to stage V. 4% of subjects with Esophagitis of whom 50% each in stage IV and stage V, pale gastric mucosa each contribute to 4% of subjects belongs to stage III. Angiodysplasia and hiatus hernia were seen in very few patients 2% each belongs to stage V.

Upper Gastro Intestinal Findings Based On Frequency of involvement.

Out of 50 cases in our study 55% Of subjects had lesions in stomach, 26% of subjects had lesions in duodenum, and 19 % of subjects had lesions in esophagus

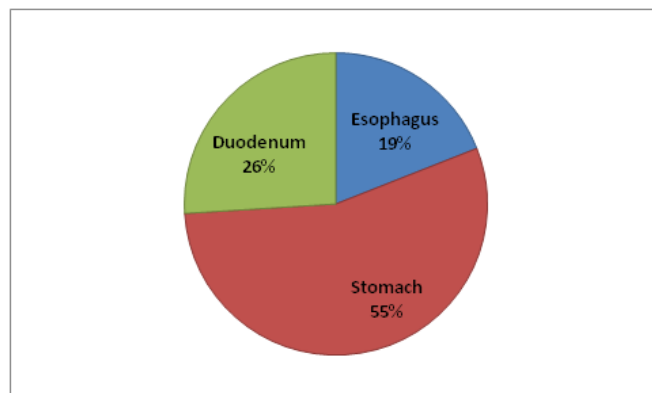


Chart 4: Percentage involvement of Upper GI in patients with CKD.

Discussion

Chronic kidney disease is associated with abnormalities of the gastrointestinal tract involving all its segments. Endoscopy performed in patients with CKD shows wide variations in the type of lesions.

Upper gastrointestinal disorders in patients with chronic kidney disease can be considered in two aspects

1. Gastro esophageal dysmotility.
2. Mucosal lesions.

Gastro esophageal dysmotility manifests as delayed gastric emptying and gastro esophageal reflex disorder. These functional disorders are very common in adult patients. Mucosal lesions such as esophagitis, gastritis, and peptic ulcer, arise due to uremia. Several previous studies showed that the gastric and duodenal lesions to be the most frequent source of upper gastro intestinal hemorrhage.

Our study includes 50 study subjects who were diagnosed to have chronic kidney disease and fulfilled inclusion criteria.

Various parameters assessed in this study were: upper gastrointestinal endoscopic findings, blood urea, serum creatinine, serum electrolytes, urine examination, ultrasonography of the abdomen and pelvis.

Our study highlights the high prevalence of upper gastrointestinal endoscopic lesions in patients with chronic kidney disease [84%]. Similar study conducted by other workers in chronic kidney disease patients also shows high prevalence of upper gastrointestinal endoscopic lesions. A study done by Mohit Goyal et al in 2014 observed that 86% subjects have upper gastrointestinal lesions. A similar study done by Sreelatha et al in 2015 has prevalence of 68%. A study done by Khedmat et al in 2007 has prevalence of 79% subjects with upper gastrointestinal lesion. A similar study done by Nardone et al in 2005 has prevalence of 90%. A study done by Al Mueilo has prevalence of 90.7%. A similar study done by Agarwal et al observed

95.7% prevalence. A similar study done by Varma et al has prevalence of 72% subjects with upper gastrointestinal manifestations. The age of patients, included in our study; ranged from 19 to 80 years, of which majority of the patients belonged to younger age groups. In our study most of the patients ranging from 31 to 40 years. Among them, most of the subjects belong to stage IV. A similar study done by Sreelatha et al, showed that the age of subjects ranged from 14 to 80 years, with majority of the subjects belonging to the age group 21 to 40 years. A similar study done by Varma et al, had subjects who aged in between 17 to 70 years. Of the 50 patients in our study, 84% had upper gastrointestinal involvement on endoscopic examination. Remaining 16% had a normal endoscopic study. Erosive gastritis 26%, either antral or fundal, was the predominant lesion found on endoscopy. GERD with or without duodenitis (16%) was next. Duodenal ulcers and gastric ulcers were seen in 8% of the subjects. Pan gastritis involving entire stomach is seen in 6%. Esophagitis, pale gastric mucosa each contribute to 4%. Angiodysplasia and hiatus hernia were seen in very few patients (2% each). Upper gastrointestinal lesions in our study had a predominant localization to the gastric and duodenal level. In a study conducted by Varma et al gastritis was the major lesion 27%; other lesions seen were duodenitis 14%, gastro duodenitis 20% and peptic ulcer 6.5%. In a study conducted by Sreelatha et al, erosive gastritis was the major lesion 16%. Stomach was involved in 48%, followed by esophagus (29%) and duodenum (23%). In the study done by Esfahani et al gastritis was predominant (60.8%), followed by duodenitis at 13% and gastroduodenitis at 7.2%. In a study conducted by Agarwal et al uremic gastropathy was found in 91.4%, esophageal involvement was 63%. In Mouhamad et al 76 gastritis at 49% was the most common lesion, hiatus hernia 20%, peptic esophagitis 16%, duodenal bulbitis 14% were also reported. In Burkinia Fasostudy gastric lesions were most common with 68.7%, followed by duodenal 32%. In a study conducted by Nardone et al 56% of patients has gastric lesions, 18% of the subjects has esophagitis and 36% had duodenitis. In a study conducted by Mohit Goyal et al gastritis is most frequent lesion in patients with CKD (68%), followed by esophagitis 42% and duodenitis 8%. In a study done by Al Mueilo et al 57% of the subjects had gastritis, 9.3% had duodenitis. In a study conducted by Margolis et

al 77 duodenitis is most frequent lesion at 60%, followed by gastric 22%. Erosive gastritis (32%) was the most common gastrointestinal lesion in a study done by Nand et al. 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. Majority of the subjects in our study 22 out of 50 belong to stage IV 44% of which 95% have upper gastrointestinal involvement; followed by stage V 30% of which 100% have upper gastrointestinal involvement, followed by stage III 22% of which 54.5% have upper gastrointestinal involvement. 4% of subjects belong to stage II, the upper gastrointestinal endoscopy examination reveals no abnormality. The study does not include subject belong to stage I. A study done by Sreelatha et al has majority of the patients 30 out of 50, belong to stage V chronic kidney disease of which 21 subjects (70%) showed upper gastrointestinal involvement. 14 subjects belong to stage IV of whom 8 subjects (57%) have upper gastrointestinal manifestations. 6 subjects belong to stage III of which 5 subjects (83.3%) have upper gastrointestinal involvement. A similar study done by Mohit Goyal et al observed that endoscopic lesions were common in Stage V than in stage IV of chronic kidney disease. 88% of subjects having gastritis were in stage V, whereas only 12% of the subjects with gastritis were in stage IV. Among subjects with stage IV, chronic kidney disease; 45% had no gastrointestinal lesions whereas only 3% of the patients in Stage V of Chronic Kidney Disease had no endoscopic evidence of gastrointestinal lesions. Among 50 patients 24 (48%) were on conservative treatment and 26 (52%) were undergoing haemodialysis. Out of 26 patients on Hemodialysis 25 (96.1%) had upper gastrointestinal lesion. Out of 24 patients on conservative treatment 17 (70.8%) had upper gastrointestinal lesions. A similar study done by Sreelatha et al of 50 subjects 26 (52%) were undergoing haemodialysis, 18 (36%) subjects underwent conservative management and 6 (12%) subjects underwent CAPD. Out of 26 HD subjects 18 (69.2%) had upper gastrointestinal involvement and 18 patients who were put on conservative management, 11 (61.1%) patients had positive endoscopic findings.

Conclusion

1. Majority of the patients with chronic kidney disease have upper gastrointestinal involvement on endoscopic evaluation.
2. Erosive gastritis is the most common upper gastrointestinal manifestation in our study.
3. Upper gastrointestinal manifestations are predominant in stage V.
4. Upper gastrointestinal findings are frequently observed in chronic kidney disease patients on dialysis.
5. Early diagnosis and management can reduce mortality and morbidity and prevent fatal complication like massive upper gastrointestinal bleed.

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