Journal of Cardiovascular Disease Research
ISSN: 0975-3583, 0976-2833 VOL15, ISSUE 11, 2024

A Study Of Endoscopic Upper Gastrointestinal Findings And Prevalence Of Helicobacter Pylori Infection In Patients With Chronic Kidney Disease

Dr Jagadish S Biradar[1], Dr Sriharsha Kulkarni[2]*, Dr Yeshavanth G[3], Dr Pramod G R[4], Dr Siddesh G[5]

[1]Junior Resident, Department of General Medicine, SSIMS&RC Davanagere
[2*]Associate Professor, Department of General Medicine, SSIMS&RC Davanagere
[3]Professor and Head, Department of General Medicine, SSIMS&RC Davanagere
[4]Associate Professor, Department of General Medicine, SSIMS&RC Davanagere
[5]Assistant Professor, Department of General Medicine, SSIMS&RC Davanagere

***Corresponding Author:** Dr Sriharsha Kulkarni
*Associate Professor, Department of General Medicine, SSIMS&RC Davanagere

ABSTRACT

Background: Chronic Kidney Disease (CKD) is a progressive condition characterized by a decline in glomerular filtration rate (GFR) and is frequently accompanied by comorbidities such as hypertension and diabetes. Gastrointestinal (GI) complications are common in CKD patients, often exacerbating their clinical burden. Helicobacter pylori infection is known to contribute to GI tract inflammation and ulceration, yet its prevalence and impact on CKD patients remain underexplored. This study aims to investigate the prevalence of H. pylori infection and assess upper GI abnormalities in CKD patients, particularly in relation to disease stage.

Objective:

This study aimed to investigate the prevalence of Helicobacter pylori infection and assess upper gastrointestinal (GI) abnormalities in patients with Chronic Kidney Disease (CKD), focusing on their correlation with CKD stages.

Methods:

A cross-sectional study was conducted involving 52 CKD patients aged over 18 years. Participants were selected based on specific inclusion and exclusion criteria, excluding those with severe comorbidities and certain lifestyle factors. Data collection included demographic information, clinical history, and laboratory investigations. Upper GI endoscopy was performed to identify abnormalities, and Helicobacter pylori infection was detected using the Rapid Urease Test (RUT). Statistical analysis was conducted to explore associations between CKD stages, GI abnormalities, and H. pylori infection.

Results: The study cohort had a mean age of 60.8 years, with a male predominance (67.3%). The majority were in advanced CKD stages, with 55.8% in stage 4 and 13.5% in stage 5. GI symptoms were common, particularly nausea and dyspepsia. Endoscopic findings showed incidence of antral gastritis (28%), erosive gastritis (18%), duodenitis (7%), congestive gastropathy (7%), candidial esophagitis (5%), GERD with gastritis (5%), nodular gastritis (5%) and other GI abnormalities (25%). Helicobacter pylori was detected in 46.2% of patients. No significant correlation was found between H. pylori infection and the stage of CKD or other demographic factors.

Conclusion: The study revealed a significant prevalence of GI abnormalities and Helicobacter pylori infection among CKD patients, particularly those in advanced stages. These findings suggest the need for routine GI evaluation and management of H. pylori infection in CKD patients to improve clinical outcomes and quality of life.

INTRODUCTION:

Chronic Kidney Disease (CKD) is a global health concern characterized by a gradual loss of kidney function over time. It is typically identified by a persistent decrease in glomerular filtration rate (GFR)

or the presence of markers of kidney damage, such as albuminuria, for more than three months [1]. CKD is categorized into five stages based on the level of GFR, with end-stage renal disease (ESRD) representing the final stage requiring dialysis or kidney transplantation for survival [2].

CKD is often associated with various co-morbid conditions, including hypertension, diabetes mellitus, cardiovascular disease, and metabolic syndrome [3]. Among these, gastrointestinal (GI) disorders are notably prevalent, significantly affecting the quality of life of CKD patients[4] . GI symptoms such as nausea, vomiting, dyspepsia, heartburn, anorexia, regurgitation, dysphagia, and hematemesis are commonly observed in patients with advanced stages of CKD [5].

Gastrointestinal manifestations in CKD patients are multifaceted, involving both structural and functional abnormalities of the GI tract. These symptoms can be attributed to factors such as uremic toxins, altered gastrointestinal motility, and increased levels of gastrointestinal hormones like gastrin[6]. Approximately 80% of CKD patients exhibit some form of GI symptom during their disease course, with a higher prevalence observed in those with ESRD [7].

Helicobacter pylori (H. pylori) infection is a significant concern in CKD patients due to its association with upper gastrointestinal pathologies, including peptic ulcer disease and gastritis[8]. The prevalence of H. pylori infection in CKD patients is comparable to that in the general population, but the infection's clinical implications may be more severe in CKD due to impaired renal function and altered immune response[9]. Increased serum levels of gastrin and other gastrointestinal hormones, which are normally cleared by the kidneys, contribute to the higher incidence of H. pylori infection in CKD patients [10].

Despite the high prevalence of gastrointestinal manifestations and H. pylori infection in CKD patients, comprehensive studies addressing these issues are limited. This study aims to investigate the endoscopic upper GI findings and the prevalence of H. pylori infection in CKD patients, providing valuable insights into the management and treatment of gastrointestinal complications in this population.

OBJECTIVES OF THE STUDY

1)To study the upper GI manifestations using fibre optic endoscopy in patients with CKD.
2)To find the prevalence of Helicobacter pylori infection in patients with CKD.

MATERIALS AND METHODS

Source of Data: The material for this study was collected from patients with Chronic Kidney Disease (CKD) who met the inclusion and exclusion criteria. These patients were either attending the Medicine Outpatient Department (OPD), the Dialysis Unit, or were admitted to the SSIMS and RC hospital.

Type of Study: cross-sectional study

Duration: 2 years (from June 2022 to July 2024)

Methodology: Patients satisfying the inclusion and exclusion criteria were enrolled in the study. All patients with CKD who met these criteria and were attending the Medicine OPD, the Dialysis Unit, or admitted to SSIMS and RC hospital were included in the study.

Sample size was estimated based on the formula 4pq/d2 where p is the prevalence of CKD, p=16% and q =1-p=84% and d=10%.

n=52

Inclusion Criteria: Patients aged >18 years diagnosed with CKD.

Exclusion Criteria:

Patients aged <18 years.
Patients with cirrhosis of the liver with complications such as variceal bleeding.
Patients on high doses of NSAIDs for extended periods.
Patients diagnosed with acute kidney injury.
Patients who were chronic alcoholics, chronic smokers, or tobacco chewers.

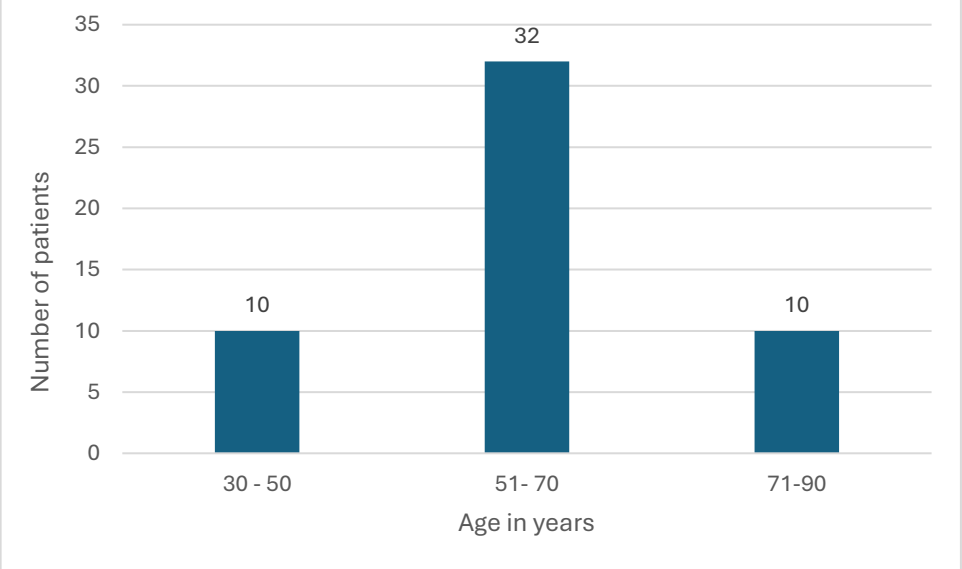
Data Collection Procedure: Enrollment and Consent: Patients fulfilling the inclusion and exclusion criteria were identified and enrolled in the study. Informed consent was obtained from all eligible patients in Kannada.
Patient Evaluation: A detailed history, physical examination, and necessary investigations were recorded for each patient. This included demographic details, medical history, CKD stage, comorbid conditions, and current medications.
Clinical Examination: Comprehensive clinical examination data were collected, including vital signs, systemic examination findings, and specific gastrointestinal symptoms or complications.
Laboratory Investigations: Complete Blood Count (CBC), Serum Electrolytes, Blood Urea, Serum Creatinine, Estimated Glomerular Filtration Rate (eGFR), USG Abdomen and Pelvis, Urinalysis, Upper GI Endoscopy with Rapid urease test for H. Pylori.
Endoscopic Evaluation: Patients with gastrointestinal symptoms underwent endoscopic evaluations as needed. Findings such as erosive gastritis, esophagitis, peptic ulcers, and other gastrointestinal complications were recorded.
Diagnosis of CKD: Based on USG renal parenchymal changes or eGFR (Cockcroft-gault equation) or deranged renal function tests for >3months
Data Recording: All collected data were recorded in a structured proforma designed for the study. This proforma included sections for patient demographics, clinical history, examination findings, laboratory results, and endoscopic findings.

RESULTS:

Table 1. Age distribution among study participants

AGE CATEGORY (years)	FREQUENCY	PERCENTAGE(%)
30 - 50	10	19.2 %
51- 70	32	61.5 %
71-90	10	19.2 %
Total	52	100%

The mean age of the study participants was 60.8 years with a standard deviation (SD) of 13.7 Most participants (61.5%) were between 51-70 years old, while 19.2% were aged 30-50 and another 19.2% were aged 71-90.

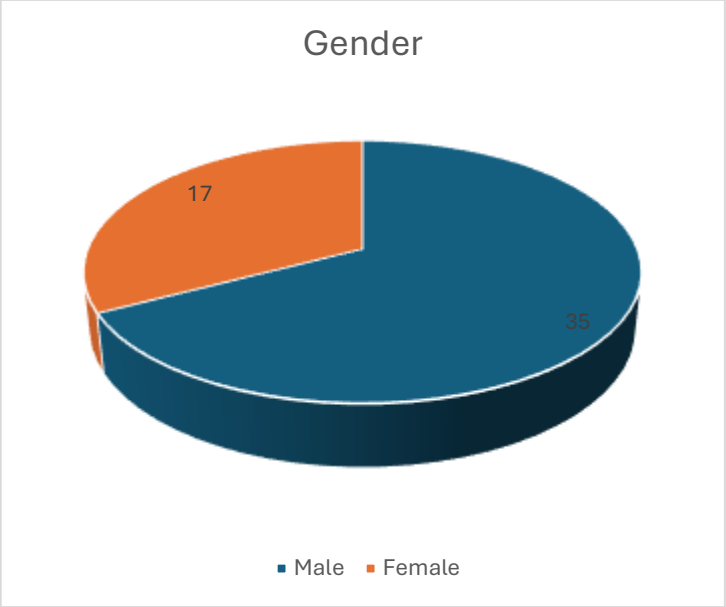


Graph 1. Bar chart showing age distribution among study participants

Table 2. Gender distribution among study participants

GENDER	FREQUENCY	PERCENTAGE
FEMALE	17	32.7%
MALE	35	67.3%
TOTAL	52	100

The gender distribution indicated that 67.3% of the participants were Male and 32.7% were Female.

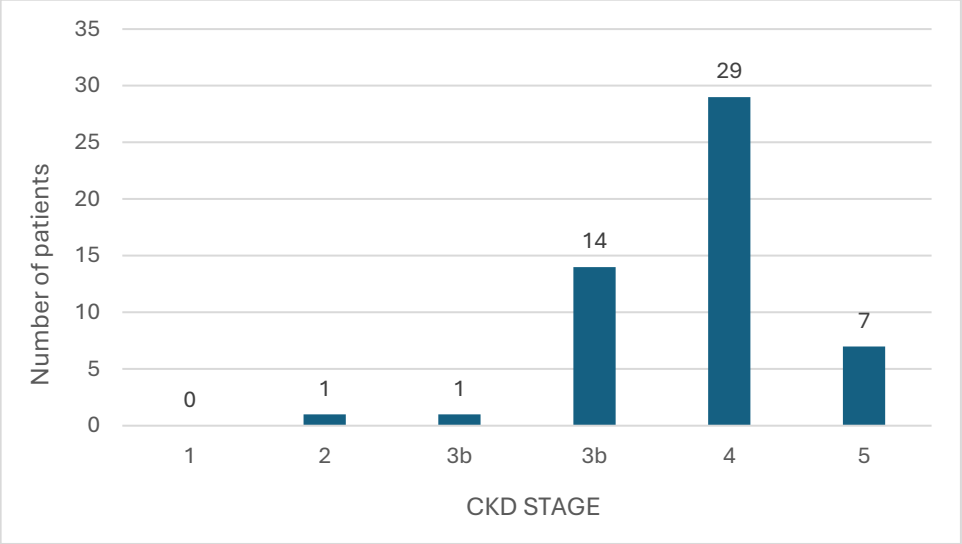


Graph 2. Pie chart representing gender category

Table 3. CKD staging among study participants

STAGE OF CKD	FREQUENCY	PERCENTAGE
1	0	0.0%
2	1	1.9 %
3b	1	1.9 %
3b	14	26.9 %
4	29	55.8 %
5	7	13.5 %
Total	52	100%

Regarding CKD staging, 55.8% of participants were in stage 4, 26.9% in stage 3b, 13.5% in stage 5, 1.9% in stage 3a, and 1.9% in stage 2.

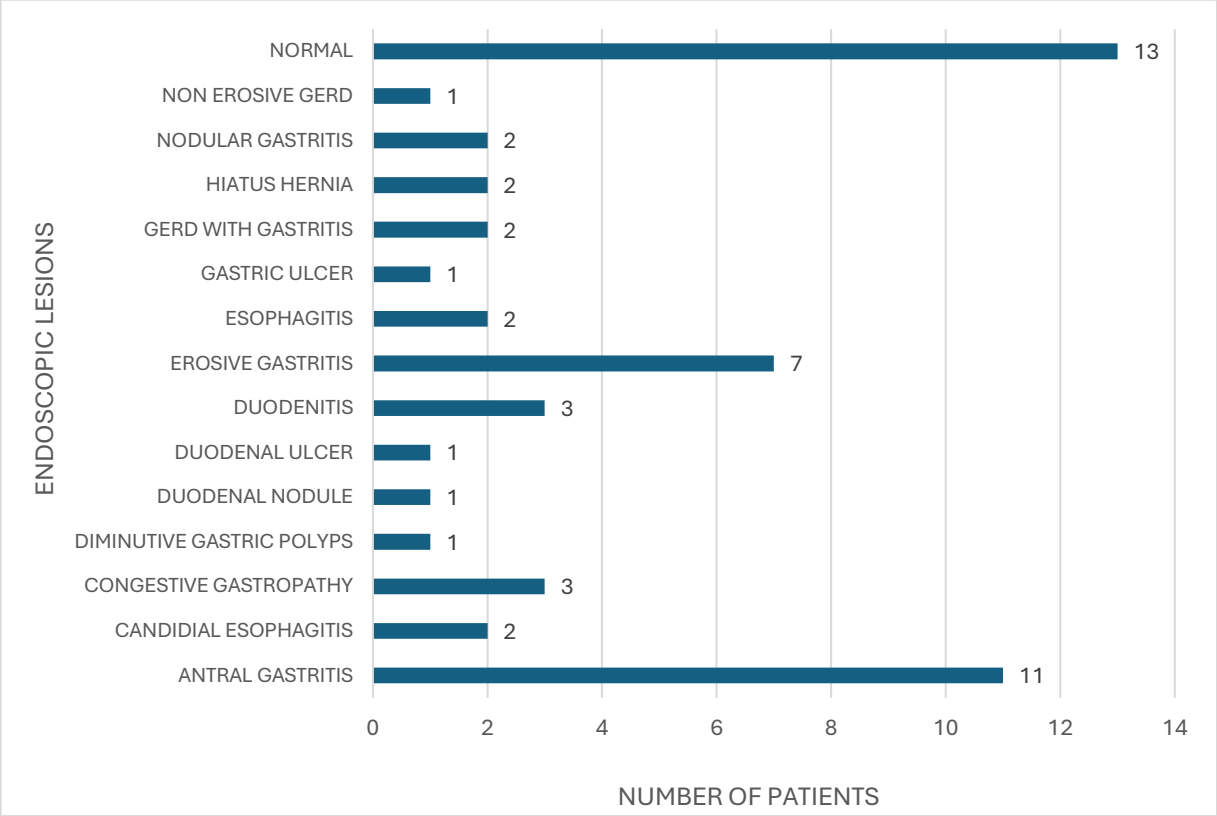


Graph 3. Bar chart showing Stages of CKD

Table 4. Endoscopic findings among study participants

LESION ON ENDOSCOPY	FREQUENCY	PERCENTAGE (%)
ANTRAL GASTRITIS	11	21.2 %
CANDIDIAL ESOPHAGITIS	2	3.8 %
CONGESTIVE GASTROPATHY	3	5.8 %
DIMINUTIVE GASTRIC POLYPS	1	1.9 %
DUODENAL NODULE	1	1.9 %
DUODENAL ULCER	1	1.9 %
DUODENITIS	3	5.8 %
EROSIVE GASTRITIS	7	13.5 %
ESOPHAGITIS	2	3.8 %
GASTRIC ULCER	1	1.9 %
GERD WITH GASTRITIS	2	3.8 %
HIATUS HERNIA	2	3.8 %
NODULAR GASTRITIS	2	3.8 %
NON EROSIVE GERD	1	1.9 %
NORMAL	13	25.0 %
TOTAL	52	100%

Endoscopic examination revealed that 21.2% of participants had antral gastritis, 13.5% had erosive gastritis, 5.8% had duodenitis, 5.8% had congestive gastropathy, and 25% had normal findings, among other less frequent lesions.

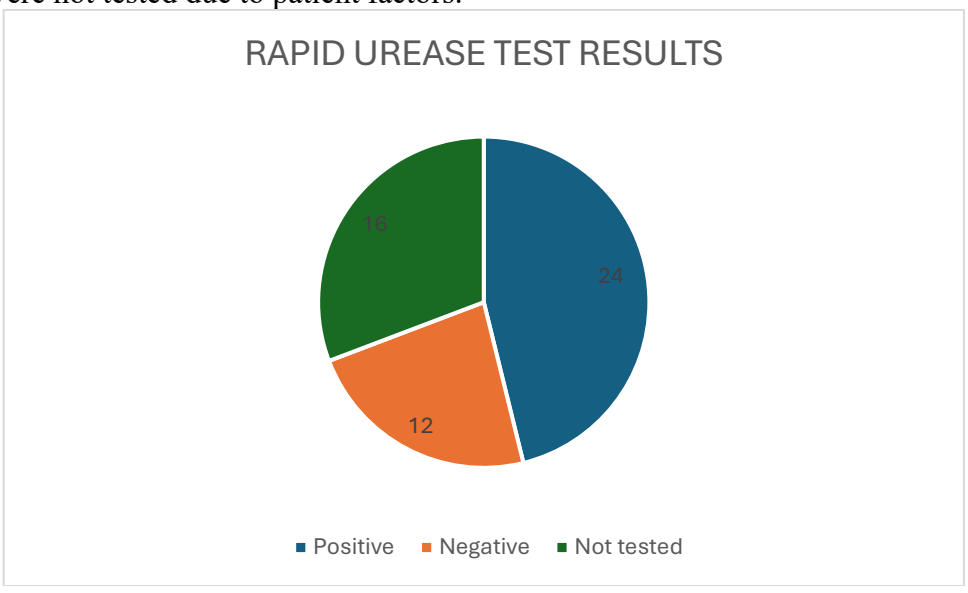


Graph 4. Bar chart showing Endoscopic findings among study participants

Table 5. Rapid urease test result among study participants

RAPID UREASE TEST	FREQUENCY	PERCENTAGE
Positive	24	46.2%
Negative	12	23.1%
Not tested	16	30.8
Total	52	100%

The rapid urease test results showed that 46.2% of participants were positive, 23.1% were negative, and 30.8% were not tested due to patient factors.



Graph 5. Pie chart showing Rapid urease test results

DISCUSSION

Chronic kidney disease (CKD) is characterized by a progressive decline in glomerular filtration rate (GFR) and is often accompanied by comorbidities such as hypertension, diabetes, and cardiovascular disease. Gastrointestinal (GI) disorders are common non-renal complications in CKD patients, with symptoms like nausea, vomiting, and dyspepsia affecting up to 80% of patients, particularly in advanced stages of the disease. Helicobacter pylori infection is prevalent in CKD patients, with increased serum gastrin levels due to impaired renal clearance contributing to GI tract inflammation. This study aims to explore the endoscopic upper GI findings and the prevalence of H. pylori infection in CKD patients, given the complex and multifactorial nature of these conditions.

SUMMARY

The study included 52 participants diagnosed with Chronic Kidney Disease (CKD). The majority of the participants were male (67.3%), with a male-to-female ratio of approximately 2:1. The average age of the participants was 60.8 years, with most participants (61.5%) being between 51-70 years old. The majority of the participants (78.8%) had hemoglobin levels between 7 to 10 g/dL, indicating a high prevalence of anemia among the study group. Mean Corpuscular Volume (MCV) was less than 80 in 53.8% of participants, indicating a trend towards microcytic anemia. Creatinine levels were mostly between 2 to 4 mg/dL (63.5%), with a mean value of 2.84 mg/dL, highlighting significant renal impairment across the cohort. Regarding CKD staging, the majority of participants were in stage 4 (55.8%), followed by stage 3b (26.9%) and stage 5 (13.5%). Most participants showed grade 3 renal parenchymal changes on ultrasound (59.6%), with significant proteinuria detected in all patients, and 65.4% had 2+ proteinuria. Endoscopic evaluations revealed that 28% of participants had antral gastritis, 18% had erosive gastritis, and 54% had other gastrointestinal abnormalities. Lesions were predominantly located in the stomach (64.1%), followed by the esophagus (23.1%) and duodenum (12.8%). The Rapid Urease Test (RUT) results showed that 46.2% of the participants tested positive for H. pylori. The prevalence of positive RUT results was higher in males (65.4%) and in patients undergoing hemodialysis (65.4%). However, statistical analysis revealed no significant association between gender, hemodialysis status, CKD stage, and the RUT results. A substantial proportion of patients reported gastrointestinal symptoms such as nausea, vomiting, and dyspepsia. These symptoms were more prevalent in advanced CKD stages, further emphasizing the gastrointestinal burden in this patient population.

CONCLUSION

This study reveals a high prevalence of gastrointestinal (GI) complications and Helicobacter pylori infection in patients with Chronic Kidney Disease (CKD), particularly in advanced stages. Endoscopic findings commonly included gastritis and esophagitis, while H. pylori infection was notably present but not significantly associated with factors like gender, hemodialysis status, or CKD stage. The results emphasize the need for regular GI screening and targeted interventions in CKD patients to manage these complications and improve patient outcomes.

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