

Upper Gastrointestinal Manifestations in Chronic Renal Failure Through Upper Gastrointestinal Endoscopy

Madavaram Sreelatha¹, V Suresh Kumar¹, G Chandra Shekar³, V Chandra Shekar⁴

¹Assistant Professor, Department of General Medicine, Mahatma Gandhi Memorial Hospital, Warangal, Telangana, India, ²Professor, Department of General Medicine, Mahatma Gandhi Memorial Hospital, Warangal, Telangana, India

Abstract

Introduction: Chronic kidney disease is a worldwide health problem. Increasing evidence occurred in the past decades indicates that the adverse outcome of chronic kidney disease, such as kidney failure, cardiovascular disease, and premature death, can be prevented or delayed.

Materials and Methods: A total number of 50 chronic kidney disease (CKD) patients admitted to Mahatma Gandhi Hospital, Warangal, between June 2013 and October 2015 were selected in this study.

Results: The majority of the patients belong to 21-30 years age group of whom 10 are males. There are 11 patients in 31-40 years age group with males far more than females. All the results are depicted in Tabular form.

Conclusion: Majority of the patients of CRF have UGI mucosal lesions on endoscopic evaluation. Patients with GI symptoms have higher incidence of GI abnormalities when compared to those without symptoms. Erosive mucosal disease is the most common form of GI pathology in CRF.

Key words: Chronic kidney disease, Esophagitis, Gastrointestinal complications, Upper gastrointestinal endoscopy, Upper gastrointestinal lesions gastritis

INTRODUCTION

Chronic kidney disease is a worldwide health problem. Increasing evidence occurred in the past decades indicates that the adverse outcome of chronic kidney disease, such as kidney failure, cardiovascular disease, and premature death, can be prevented or delayed. Earlier stages of chronic kidney disease can be detected through laboratory testing and treatment of earlier stages of chronic kidney disease is effective in slowing the progression toward kidney failure.¹

It was way back in 1934 when Jaffe² and Laing reported the gastrointestinal (GI) finding in 136 autopsy cases who

had uremia.² At that time, the relevance of such a study was more of academic one. However, recently more and more number of patients of chronic renal failure (CRF) are being submitted for renal transplantation or are being maintained by long-term maintenance hemodialysis or by judicious conservative management.³⁻⁵

The patients on maintenance hemodialysis may bleed from the mucosal lesions with the use of heparin in the dialysis program. Even in asymptomatic patients of CRF on maintenance hemodialysis, investigators have shown that the GI blood loss is much more than in controls. Hence, a proper GI assessment is of paramount importance either for a prospective renal transplantation candidate or those patients having even minor GI symptoms when they are on maintenance hemodialysis or conservative management of CRF.

In a patient who is being offered renal transplantation, the upper GI (UGI) involvement in the CRF syndrome

Access this article online



www.ijss-sn.com

Month of Submission : 03-2017

Month of Peer Review : 04-2017

Month of Acceptance : 05-2017

Month of Publishing : 05-2017

Corresponding Author: Dr. Madavaram Sreelatha, Department of General Medicine, Mahatma Gandhi Memorial Hospital, H.No: 25-7-186, Vishnupuri, Kazipet, Warangal - 506 003, Telangana, India. Phone: 9849091006. E-mail: drlathavenkat@gmail.com

assumes overwhelming importance, because the uremic gastropathy worsens in the post-transplant period with the use of steroids and immunosuppressive drugs, which are used for an indefinite period in the post-transplant case. Hadjiyannakis *et al.* have reported that 11% of their patients in the post-transplant period had UGI bleeding or perforation, with mortality for an operative procedure being more than 50-60% for such an eventuality.

A proper diagnosis of peptic ulcer is both important and difficult in a patient of CRF, because of the risk of GI hemorrhage in the post-transplant period. Radiological studies of GI tract can be difficult to interpret because large nodular folds are often present in duodenal bulb can be confused with acute ulcer crater. Furthermore, mucosal lesions can be missed by radiography of the UGI, which employs only single contrast.

Fiber-optic endoscopes have revolutionized the examination of GI tract, and we, in our study, have used this for evaluation of UGI tract in patients of CRF.

MATERIALS AND METHODS

A total number of 50 chronic kidney disease (CKD) patients admitted to Mahatma Gandhi Hospital, Warangal, between June 2013 and October 2015 were selected in this study.

Inclusion Criteria

- A. Patients with serum creatinine above 3 mg % with
 - 1. Abnormal findings on renal ultrasound - asymmetric kidney size, small kidney. (<8 cm) or large polycystic kidney/increased echogenicity.
AND/OR
 - 2. Increased serum creatinine with no improvement for >3 months.
AND/OR
 - 3. Uremic symptoms over 3 months with increased serum creatinine.
AND/OR
 - 4. Other - anemia, hyperphosphatemia, and hypocalcemia.
- B. Patients with age varying from 10 to 80 years.
- C. Both male and female patients.
- D. Patients on conservative treatment/hemodialysis (HD)/continuous ambulatory peritoneal dialysis (CAPD).

Exclusion Criteria

- Patients of CRF with:
- 1. Diabetes mellitus

- 2. Chronic analgesic intake, i.e., nonsteroidal anti-inflammatory drugs
- 3. H/O previous APD.

All the CRF patients with the above characteristics are evaluated for UGI manifestations using flexible fiber-optic endoscopy of the UGIT apart from clinical history taking, examination, and various investigations.

RESULTS

The majority of the patients belong to 21-30 years age group of whom 10 are males. There are 11 patients in 31-40 years age group with males far more than females. There are eight patients in each group, i.e., 5th and 6th decade. In younger age group, i.e., <20 years, only five patients are present. There are only two and three patients in age groups between 61-70 and 71-80 years, respectively. Except in 7th decade, there is male preponderance in all categories (Table 1).

Out of the 50 patients, males are 40 and females are 10 (Table 2).

About 34 patients, out of the 50, have UGI involvement on endoscopic examination. Remaining 16 patients 32% have normal UGI mucosa (Table 3).

In this study, 26 patients (56%) presented with only 1 year duration of illness, out of which 14 males and three females

Table 1: Age and sex distribution

Age group (years)	Number of patients			Percentage
	Male	Female	Total	
11-20	4	1	5	10
21-30	10	3	13	26
31-40	10	1	11	22
41-50	6	2	8	16
51-60	7	1	8	16
61-70	1	1	2	4
71-80	2	1	3	6

Table 2: Sex distribution of CRF patients

Sex	Number of patients (%)
Males	40 (80)
Females	10 (20)

CRF: Chronic renal failure

Table 3: Percentage of UGI findings in CRF patients

UGI findings	Number of patients (%)
Present	34 (68)
Absent	16 (32)

CRF: Chronic renal failure, UGI: Upper gastrointestinal

showed positive UGI findings. 11 patients presented with 1-2 years duration among which majority of the patients are males who showed positive findings. Only two females showed UGI lesions with the duration of illness varying from 2 to 3 years. Among the five patients, with the illness of 3-4 years, only three patients have UGI lesions. Out of the total of 5 patients with the CKD of 4-6 years duration, only three males have UGI lesions. There are no patients with the positive findings in CKD of above 6 years (Table 4).

About 19 patients out of the 50 have UGI symptoms such as dyspepsia, nausea, and vomiting. Remaining 31 patients have no UGI symptoms (Table 5).

Among the 19 UGI symptomatic patients, 15 have positive UGI findings (78% of the symptomatics). Out of 31 patients who have no UGI symptoms, 19 showed UGI lesions (61% of the asymptomatics) (Table 6).

Erosive gastritis, either antral or fundal is the predominant UGI lesion, found on endoscopy - 27%. Erosive esophagitis and duodenal ulcer occupy the next place, each 12%. Gastric ulcer is seen in 10% of cases. Pangastritis involving entire stomach is seen in 8% of cases. Esophageal varices, diverticulum, gastroesophageal reflux disease (GERD), and pale gastric mucosa each contribute to 5% of lesions. Less number of

cases have angiodysplasia of stomach or hiatus hernia (3%). Only 2% of cases showed erosive duodenitis (Table 7).

Of all the 3 parts, stomach is predominantly involved - 48%. Esophagus is the second most one - 29% and duodenum is involved in 23% of cases (Table 8).

Out of 50 patients, 37 have 3-9 mg/dl serum creatinine levels, of them 24 have positive UGI findings. 10 patients

Table 7: Percentage of various UGI findings in CRF patients

Type of lesion	Percentage
Erosive gastritis	27
Gastric ulcer	10
Angiodysplasia of stomach	3
Pangastritis	8
Pale gastric mucosa	5
Duodenal ulcer	12
Erosive duodenitis	2
Esophageal varices	5
Erosive esophagitis	12
GERD	5
Mallory Weiss tear	3
Esophageal diverticulum	5
Hiatus hernia	3
Total	100

GERD: Gastroesophageal reflux disease, CRF: Chronic renal failure

Table 4: UGI findings in relation with duration of illness in CRF patients

Group	Duration of illness (months)	Number of cases	Positive UGI findings	Male	Female
1	3-12	26	17	14	3
2	13-24	11	09	7	2
3	25-36	2	02	0	2
4	37-48	5	03	2	1
5	49-60	2	01	1	0
6	61-72	3	02	2	0
7	73-84	0	0	0	0
8	85-96	1	0	0	0

GI: Gastrointestinal, CRF: Chronic renal failure

Table 5: UGI symptomatic/asymptomatic in CKD patients

UGI symptoms	Number of patients (%)
Present	19 (38)
Absent	31 (62)

CKD: Chronic kidney disease, UGI: Upper gastrointestinal

Table 6: UGI findings in patients with GI symptomatic and asymptomatics in CRF patients

CRF patients	Positive (%)	Negative (%)	Total (%)
UGI symptomatics	15 (78.94)	04 (21.06)	100
UGI asymptomatics	19 (61.29)	12 (38.71)	100
Total	34 (68)	16 (32)	100

GI: Gastrointestinal, UGI: Upper gastrointestinal, CRF: Chronic renal failure

Table 8: Percentage of frequency of involvement of esophagus, duodenum, stomach in CRF patients

Part involved	Percentage
Stomach	48
Esophagus	29
Duodenum	23

CRF: Chronic renal failure

Table 9: UGI findings in relation with s. creatinine levels in CRF patients

Serum creatinine levels	Positive UGI findings	Negative UGI findings	Total
3-9 mg/dl	24	13	37
9.1-15 mg/dl	7	3	10
15.1-21 mg/dl	1	1	2
>21.1 mg/dl	1	0	1
Gross total	33	17	50

GI: Gastrointestinal, UGI: Upper gastrointestinal, CRF: Chronic renal failure

Table 10: Distribution of CKD cases according to the cause of CKD

Cause of CKD	Total patients	UGI findings present	UGI findings absent
CGN	20	18	2
CIN	12	8	4
Miscellaneous	18	8	10

CKD: Chronic kidney disease, UGI: Upper gastrointestinal, CGN: Compagnie generate de navigation, CIN: Contrast-induced nephropathy

have 9.1-15 mg/dl serum creatinine levels, of them 7 have positive UGI findings. Only three patients have high level of azotemia (serum creatinine >15.1 mg/dl) (Table 9).

Chronic glomerulonephritis constitutes the major cause of CKD, accounting for 40% of the total cases, next comes the chronic interstitial nephritis, which is the cause of the CKD in 12 cases. Among the miscellaneous group consisting of 18 patients, are included other causes such as polycystic kidney disease, membranous nephropathy, membranoproliferative glomerulonephritis, and immunoglobulin A nephropathy (Table 10).

The majority of the patients, 30 out of 50, belong to Stage V CKD, of whom 21 (70%) showed UGI lesions. 14 patients belong to Stage IV CKD of whom eight patients (57%) have positive UGI findings. Rest of the patients is in Stage III CKD (Table 11).

The majority of the patients, 26 out of 50, are being treated with HD, of whom 18 (69.2%) showed UGI lesions. Six patients are on CAPD, all (100%) have positive UGI findings. Rest of the patients is on conservative management, of whom 11 patients (61.1%) have UGI findings (Table 12).

DISCUSSION

UGI tract disorders in patients with chronic kidney disease can be considered from two aspects:

- Gastroesophageal dysmotility
- Mucosal lesions.

Gastroesophageal motility manifests as delayed gastric emptying and gastroesophageal reflux. These functional disorders are very common in adult patients. The other

aspect of GI disorders in uremia is mucosal lesions such as esophagitis, gastritis, duodenitis, and peptic ulcer. Several previous studies showed that the gastric and duodenal lesions to be the most frequent source of UGI hemorrhage.

In this study, a total number of 50 patients with CKD Stages III-V (CRF) admitted in Osmania General Hospital are taken, and they are evaluated for UGI manifestations with reference to UGI endoscopy taking into consideration, the age, sex, duration of illness, presence or absence of UGI symptoms, degree of azotemia, cause of CKD, and treatment modality that is being used in these cases.

In this study, the age of patients ranged from 14 to 80 years, least, 10% in the age group ranging from 61 to 80 years and the majority 48% in the age group varying from 21 to 40 years.

In a study conducted by Varma *et al.*,³ the age of the patients ranged from 17 to 70 years. In another study by Esfahani⁴ done in 2007, ages of the patients were between 4 and 18 years.

A number of male patients (80%) are far more than the female patients (20%) in this study. Out of 50 patients, 34 patients (68%) showed that UGI involvement of which 26 is males and 8 are females. In a study conducted by Varma *et al.*, out 92 patients 72% developed UGI lesions.

In the study by Esfahani, out of 69 patients, 56 patients had UGI lesions. In a study of UGI endoscopic evaluation in CRF by Agrawal *et al.*,⁵ out 70 patients 95.7% patients showed UGI involvement.

In this study, 26 patients (56%) presented with only 1 year duration of illness. This could be due to the fact that patients may be asymptomatic for a long period before the presentation. Out of total 50, 17 patients (35%) have UGI symptoms (dyspepsia, heartburn, belching, epigastric pain, nausea, vomiting, and hematemesis). The UGI involvement, i.e., erosions/ulcers/other lesions is proportionately more in UGI symptomatics - 78.9% (15 out of 19) when compared to UGI asymptomatics - 61.2% (19 out of 31). In the study by Esfahani, 82.6% (57 out of 69) of the study group had GI symptoms out which, only one had normal UGI endoscopic appearance.

In a study of gastroduodenal lesions and *Helicobacter pylori* infection in HD patients by Al-Mueilo *et al.*,⁶ it was shown that GI abnormalities are common, even in the absence of symptoms. Moustafa and coworkers⁷ reported that even asymptomatic patients (60%) had mucosal lesions in endoscopy of UGIT ([6]-in the ref. Article-48).

According to serum creatinine levels, majority of the patients, i.e., 37, had serum creatinine in the range of

Table 11: UGI findings in relation to the stage of CKD

Stage of CKD	Positive UGI findings	Negative UGI findings	Total
III	5	1	06
IV	8	6	14
V	21	9	30

GI: Gastrointestinal, CKD: Chronic kidney disease, UGI: Upper gastrointestinal

Table 12: UGI findings in relation to the type of management in CRF patients

Type of treatment	Positive UGI findings	Negative UGI findings	Total
HD	18	8	26
CAPD	6	0	06
Conservative	11	7	18

GI: Gastrointestinal, UGI: Upper gastrointestinal, CRF: Chronic renal failure, CAPD: Continuous ambulatory peritoneal dialysis

3-9 mg/dl, of which 24 patients had positive UGI findings. 10 patients had serum creatinine in the range of 9.1-15 mg/dl, of which seven patients had positive UGI findings. Two patients had serum creatinine in the range of 15.1-21 mg/dl, of which one patient had mucosal lesion. Only one patient had extremely elevated levels of serum creatinine >21 mg/dl and also had UGI involvement.

In this study, the patients with mixed lesions, i.e., 9 out of 50 (18%) outnumbered those with isolated lesions involving either esophagus, stomach, or duodenum alone. Mixed lesions include GERD with esophagitis/pangastritis, GU and DU/esophagitis, and gastritis etc.

Among the isolated lesions erosive gastritis constitutes a major chunk of 16% (either fundal or antral gastritis). Gastric involvement in various forms (erosive gastritis, gastric ulcers, and angiodysplasia) constitutes the majority of UGI findings (48%) in this study when compared to esophagus (29%) and duodenum (23%).

Lesions include esophagitis 2%, esophageal diverticulum 2%, esophageal varices 4%, GERD 2%, Mallory Weiss tear 2%, duodenal ulcer 6%, and erosive duodenitis 2%.

In a study conducted by Varma *et al.*,³ gastritis was the major lesion 27%. Other lesions - duodenitis 14% gastroduodenitis 20%, telangiectasia in 4.3%, and peptic ulcer 6.5%.

In the study by Esfahani,⁴ gastritis was the predominant one accounting for 60.8% other lesions - duodenitis 13%, gastroduodenitis 7.2%, peptic ulcer and esophago gastritis each 4.3%, esophagitis 3%. In another study by Agrawal *et al.*,⁵ UGI endoscopic involvement was seen in 95.7% patients. Uremic gastropathy was found in 91.4% patients (mucosal edema 60% and erosions 43%), esophageal involvement - 63%, and duodenal involvement - 49%.

When looked into the causes of CKD in my study, Compagnie Generale de Navigation constitutes the major cause involving 40% patients, of which 36% have UGI lesions. Next leading cause is contrast-induced nephropathy, i.e., 24%, of which 16% have positive endoscopic findings. Other miscellaneous causes constitute the remaining 36% of patients, of whom 16% showed lesions.

Most of the patients, in our study, belong to Stage V CKD 60%, of which 42% have UGI involvement. The majority of the patients in this study 52% (26 out of 50) are being offered hemodialysis as the treatment modality.

Out of them, 36% have positive UGI findings, which could be due to either uremia per se or due to usage of heparin in hemodialysis.

In the study by Esfahani,⁴ it was quoted that duration of dialysis did not have any influence on prevalence of GI symptoms or lesions. In this study, only 12% (6 patients) are treated with CAPD and all these patients have UGI involvement. Out of 18 patients who are on conservative management in this study 11 patients have positive endoscopic findings.

CONCLUSION

- Majority of the patients of CRF have UGI mucosal lesions on endoscopic evaluation. Patients with GI symptoms have higher incidence of GI abnormalities when compared to those without symptoms.
- Erosive mucosal disease is the most common form of GI pathology in CRF.
- Erosive gastritis as well as multiple sites of involvement of UGIT is the most common lesions.
- Esophageal and duodenal involvement is less common than the gastric lesions.
- No correlation could be made with GI symptoms to the patterns of GI findings on endoscopy.
- Patients with chronic glomerulo nephritis and Stage V CKD showed predominant UGI involvement.
- UGI findings are frequently observed in CRF patients on dialysis.
- No correlation could be made with age, sex, degree of dialysis control, and duration of azotemia to the presence or absence or the pattern of GI involvement in CRF.

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How to cite this article: Sreelatha M. Upper Gastrointestinal Manifestations in Chronic Renal Failure Through Upper Gastrointestinal Endoscopy. *Int J Sci Stud* 2017;5(2):221-225.

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