

Study of the clinical profile and upper gastrointestinal endoscopic findings in patients with chronic kidney disease

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ABSTRACT

Background: Uremic milieu associated with chronic kidney disease (CKD) is associated with upper gastrointestinal (GI) symptoms such as nausea, vomiting, anorexia, and GI bleeding. **Objective:** The present study intended to ascertain the prevalence of various upper GI (UGI) symptoms and UGI endoscopic abnormalities in patients of CKD. **Materials and Methods:** Patients were stratified according to glomerular filtration rate and their respective GI symptoms score was determined and they were subjected to UGI endoscopy. **Results:** Thirty males and 24 females of CKD were compared with equal number of control group who have normal kidney function but may or may not have UGI disturbance. The severity of CKD correlated with high GI symptom score with maximum number of patients in dialyzed CKD subgroup. Anorexia followed by nausea and abdominal pain was dominant symptoms in the study group. On endoscopic evaluation, hiatus hernia and duodenitis were significantly more prevalent in the study group over the control group. **Conclusion:** Based on these observations, this study supports the routine usage of UGI endoscopy in evaluation of CKD patients.

KEY WORDS: Clinical Profile; Upper Gastrointestinal Endoscopic; Chronic Kidney Disease


INTRODUCTION

Chronic kidney disease (CKD) results from progressive and irreversible deterioration of the nephrons irrespective of cause. The diminished effective functioning of kidney tissue causes impairment of excretory, metabolic, and endocrine function of kidney, leading to the development of clinical syndrome of uremia.^[1,2] Upper gastrointestinal symptoms such as nausea, vomiting, anorexia, and gastrointestinal (GI) bleeding are one of the most frequent indications of hospitalization in patients with kidney impairment and they significantly increase

morbidity and mortality.^[3] Pathophysiology by which uremia predisposes to GI tract mucosal injury is multifactorial. Upper GI (UGI) symptoms may vary from mild symptoms to life-threatening GI bleeding and endoscopy may timely diagnose the most of these abnormalities to intervene accordingly.^[4,5] The incidence of GI symptoms can largely be accredited to the causal conditions such as increase level of uremic toxin, the effect of dialysis, lifestyle changes, or the drugs used for its treatment. Hence, routinely endoscopic evaluation should be done in all CKD patients having GI symptoms. The present study was designed with an objective to study the prevalence of various UGI symptoms and UGI endoscopic abnormalities in patients of CKD.

MATERIALS AND METHODS

The study was carried out in S N Medical College, Agra and F H Medical College, Tundla. Patients were enrolled for the study from the outdoor and indoor department of Medicine

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Department at S N Medical College, Agra and F H Medical College, Tundla, from December 2017 to June 2018. All the patients were duly informed about the procedure of the study and a desired consent was obtained from all the subjects participating in the study. The study was approved by the ethical committee of both the institutes.

This prospective study includes 54 patients with CKD of Stage 3, 4, and 5 with or without UGI symptoms. The diagnosis of CKD was made on Kidney Disease: Improving Global Outcomes guidelines. Consent for the study was taken from all the patients of all age groups and both genders.^[6] We excluded those patients who were critically ill and not suitable for UGI endoscopy, acute renal failure, or chronic liver failure, previously diagnosed with peptic ulcer disease or harboring *Helicobacter pylori* or have taken *H. pylori* eradication treatment recently, patients of variceal bleed and pregnant patients.^[7]

Glomerular filtration rate (GFR) was estimated by equation adopted from modification of diet in the renal study.^[8]

$GFR = 1.86 \times (P_{cr})^{-1.54} \times Age^{-0.203} \times 0.742$ (For female patients)

Patients of the study group were divided into three groups based on GFR:

Stage of CKD	GFR (ml/min/1.73 m ² body surface area)
Stage 3	30–59
Stage 4	15–29
Stage 5	<15 or on dialysis

Stage 5 patients were further divided into two groups, dialyzed group and non-dialyzed group. Dialyzed group consists of patients, those were on regular maintenance of dialysis since at least for 1 month or more. Non-dialyzed group consists of those patients of CKD Stage 5 who either refused for dialysis or who were evaluated before subjected them to dialysis 1st time.

Patients selected were subjected to complete physical evaluation related to disease, the cause of disease and history was noted. Patients were interviewed for the presence of various UGI symptoms such as anorexia, dysphagia, nausea, vomiting, UGI bleed, hiccups, abdominal distention, and abdominal pain.

For making an internal comparison, symptoms were scored on the basis of frequency and severity of symptoms as in Table 1.

Each symptom domain had a score from 0 to 6. The total UGI symptom score of a particular patient was the sum of a score of all symptoms domain of the patients.

Apart from this, all the selected patients were subjected to laboratory investigation such as complete hemogram,

biochemical analysis, blood sugar analysis, ultrasonography, hepatitis B surface antigen, HIV, and anti-hepatitis C virus. UGI endoscope^[9] was done using endoscope EPK i 5000 (Pentax, Tokyo, Japan).

RESULTS

A total of 54 patients were identified and selected for the study. It contains 30 males and 24 females with CKD and with or without UGI symptoms. The control group was composed of same number of patients gender wise with normal renal function referred to endoscopy unit for various indications. The age-wise distribution is given in Table 2.

The mean age of the study group was 36.6 ± 6.3 years and of the control group was 36.8 ± 5.9 . There is no significant difference found between the demographic distribution of the population of the study and control group.

Patients Group According to the Stage of CKD and their Mean UGI Symptoms Score

Majority of the patients (64.8%) were suffering from CKD Stage 5. 13 were of non-dialyzed group and 8 were of the dialyzed group. Stage 5 patients were the highest with average UGI symptoms scores, i.e., 13.28. Patients of Stage 4 having higher mean GI symptom score 8.54 than the patients having Stage 3 CRD, i.e., 4.125. The mean score of GI symptoms is significantly different from each other. The frequency of various UGI symptoms was showing increasing trends

Table 1: Score of the GI symptoms

Description	Score
No symptoms	0
Frequency	
Occasionally	1
Frequently	2
Daily or always	3
Severity	
Mild	1
Moderate	2
Severe	3

GI: Gastrointestinal

Table 2: Age-wise distribution of patients selected

Age (years)	Test		Control	
	Male	Female	Male	Female
<20	0	1	1	1
20–29	5	5	5	4
30–39	13	9	11	11
40–49	9	5	10	4
50–59	1	3	2	2
>60	2	1	1	2

with decreasing GFR and there was a negative correlation between GFR and mean UGI symptoms score ($R = 0.468$). The distribution of patients and their mean UGI symptoms score is depicted in Table 3.

Comparison of GI Symptoms between the Study and Control Groups

The prevalence of UGI symptoms in the study group was studied and found that anorexia was highly prevalent among 22.2% of patients followed by nausea (18.5%) and abdominal pain (14.8%), whereas in the control group, abdominal pain (22.2%) followed by acid regurgitation (18.5%) and abdominal distention (14.8%). Least prevalence was reported among the patients with dysphagia and GI bleeding in the study group and hiccups among the patients in the control group. The prevalence of UGI symptoms is given in Table 4.

Prevalence of Symptomatic Patients among Patients with CKD

In the population with CKD, 91.4% of Stage 5 patients were having at least one or more UGI symptoms among which 14 patients were from the dialyzed group and 18 patients were from undialyzed group followed by 72.8% of patients in Stage 4 group and least prevalence 50% among Stage 3 patients. The difference in the prevalence among the groups is statistically significant and it is evident that as the severity of CKD increases, the prevalence of UGI symptoms also increases [Table 5].

Comparison of Endoscopic Abnormalities between the Study and Control Group

The prevalence of various endoscopic abnormalities in CKD patients was studied and found that a hiatus hernia (9.3% vs. 0%), erosive gastritis (3.7% vs. 1.9%), and duodenitis (14.8%

vs. 7.4%) were significantly more common in the study group than control group. Gastric telangiectasia, atrophic gastritis, and hiatus hernia were only found in the study group.

DISCUSSION

UGI symptoms in uremic patients usually consequence of disequilibrium of liquid and electrolyte imbalance, adverse effect of toxins and metabolite accumulated in the body as a result of decreased kidney excretion. From the study, it was evident that there is always a high prevalence of UGI symptoms compared to the control group. Of 54 patients, all patients were having one or more dyspeptic symptoms. The prevalence of various GI symptoms in the present study was in the range from 3.7% to 22.2%. The prevalence of anorexia was most common among patients with CKD followed by nausea and abdominal pain. Abdominal distention and vomiting were also frequent symptoms in CKD patients.

Acid regurgitation was less frequent in patients with the CKD than the control group (7.4% vs. 18.5%). This may be due to the frequent prescription of antacid and proton-pump inhibitors.

Result obtained from this study was in concordance with the previous study done in 2003 by Agarwal *et al.*,^[10] he found prevalence of GI symptoms ranging from 46.6% to as high as 90%, in another study done in 1996 by 77% by Farshakh *et al.*^[11] The percentage of GI symptoms ranged to 77%. A study done in 1998 by Hammer *et al.*^[12] The presence of GI symptoms was 79%. A study done in 2006 by Suzana *et al.* GI symptoms were 46%. In another study performed by Gupta and Shende,^[13] in 2017, 36 males and 14 females ($n = 50$) were studied. Most common age group was 41–50 years; the most common GI symptom was anorexia (100%) and nausea was present in 94% of patients and GI bleed was seen in 8%, whereas the present study also reported to have highest

Table 3: Distribution of patients in various stages of CRF in the study population

Stage of CRF	Male	Female	Total	% ($n=54$)	Mean UGI symptoms score	
Stage 3	5	3	8	14.8	4.125	
Stage 4	4	7	11	20.4	8.54	
Stage 5	Dialyzed	8	8	29.6	64.8	13.28
	Non-dialyzed	13	6	35.2		

CRF: Corticotropin-releasing factor, UGI: Upper gastrointestinal

Table 4: Prevalence of UGI symptoms among the study and control groups

Groups	Dysphagia	Symptoms								
		Anorexia	Nausea	Vomiting	Hiccups	GI bleeding	Acid regurgitation	Abdominal pain	Abdominal distention	
CKD patients	n (%)	2 (3.70)	12 (22.2)	10 (18.5)	5 (9.2)	5 (9.2)	2 (3.7)	4 (7.4)	8 (14.8)	6 (11.11)
Control group	n (%)	6 (11.1)	5 (9.2)	6 (11.1)	4 (7.4)	1 (1.8)	2 (3.7)	10 (18.5)	12 (22.2)	8 (14.8)

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

Table 5: Prevalence of symptomatic patients among different stages of CKD

Stage of CRF	Total number of symptomatic patients	% (n=54)
Stage 3	4/8	50.0
Stage 4	8/11	72.8
Stage 5	32/35	91.4
Dialyzed	14/16	87.5
Undialyzed	18/19	94.7

CKD: Chronic kidney disease, CRF: Corticotropin-releasing factor

prevalence of anorexia, i.e., 22.2%. Researchers also reported that the common UGI lesion was gastritis (28%), whereas in the present study, it is reported as 33.4%, esophagitis (16%), and duodenitis (12%), the present study found it to be 7.4% and 14.8%, respectively. Majority of patients had creatinine clearance between 5 and 10 ml/min and most of the patients had duration of disease between 11 and 20 months. This is also supported by the study done by Sreelatha *et al.*,^[14] in 2017, which reported in their study that majority of the patients of corticotropin-releasing factor (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. The present study also resembles the study done by Krishnan and Venkataraman,^[15] in 2011, symptoms of GI disturbance were found in 82 (28.6%) of the 287 patients. In the 172 patients with endoscopic abnormalities, there were 49 asymptomatic and 123 symptomatic cases. Shabka *et al.*,^[16] in 2017, performed a study to detect upper endoscopic findings in patients with CKD. The duodenum was the most common site of lesion with duodenal lesion detected in 24 (80%) patients. There was a positive correlation found between the prevalence of UGI symptoms and severity of CKD; there was no statistically significant difference found in the prevalence of UGI symptoms between dialyzed and undialyzed patients. Strid *et al.*,^[17] 2002, also documented similar results.

The present study is unique as it is conducted in a teaching center in North India and is representative of the population; however, lesser number of patients limits validation of these results.

CONCLUSION

It has been documented since a long time that GI complications are more common in CKD as compared to the general population. This study is also proved to be in accordance with the same phenomenon. All the patients with CKD showed a high prevalence of various UGI symptoms in comparison to the control group. Different stages of CKD are prevalent to have different GI symptoms and the prevalence indeed increases with the severity of the CKD. In dialyzed

and undialyzed group of patients of Stage 5 does not have a significant difference in the prevalence of GI symptoms, which proves that it cannot be considerable fact while differentiating the clinical aspects of patients of these two classes. While the prevalence among other stages of CKD was statistically different.

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