

Original Research Article

UTILIZATION PATTERN OF ANTI-PEPTIC ULCER DRUGS IN A TERTIARY CARE HOSPITAL: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Anti-peptic ulcer drugs (APUDs) are among the most frequently prescribed medication classes, yet comprehensive utilization data from Indian hospital settings are limited.

Materials and Methods: This cross-sectional, observational study was conducted in the Departments of Pharmacology and General Medicine of a tertiary care hospital in Mangalore over 12 months (January–December 2017). A total of 280 in-patients were selected by simple random sampling. Data on demographics, disease profile, and APUD prescription patterns were collected using a semi-structured proforma. Prescription quality indicators (indication, dosage adequacy, duration, frequency, route, branded/generic) were assessed.

Results: The mean age was 47.23 ± 17.5 years; 63.2% were male. APUDs were prescribed to 229 patients (81.8%). Proton pump inhibitors (PPIs) were the most common drug class (66.1%), with pantoprazole being the most frequently prescribed specific drug (48.5%). Single-drug regimens were used in 80.8% of APUD prescriptions. An appropriate indication was documented in 88.2% of prescriptions, and adequate dosage was observed in 94.3%. The oral route was preferred (61.1%), and branded drugs were prescribed in 77.7% of cases.

Conclusions: APUD prescribing is highly prevalent in this tertiary care inpatient setting, with PPIs — particularly pantoprazole — being the dominant drug class. While indication documentation and dosage adequacy were satisfactory, the predominance of branded drugs warrants continued pharmacovigilance and institution-specific prescribing guidelines to promote cost-effective therapy.

Keywords: Anti-peptic ulcer drugs; Drug utilization; Peptic ulcer disease; Prescription pattern; Proton pump inhibitors; Tertiary care hospital.

INTRODUCTION

Peptic ulcer disease (PUD) is a condition characterized by discontinuity of the epithelial lining caused by the damaging actions of pepsin and gastric acids on the gastro-duodenal defence mechanisms, usually occurring in the stomach and proximal duodenum.^[1,2] *Helicobacter pylori* infection and non-steroidal anti-inflammatory drugs (NSAIDs) are the principal aetiological factors, and

complications include gastrointestinal bleeding, perforation, and gastric outlet obstruction.^[3] Anti-peptic ulcer drugs (APUDs) are the mainstay of treatment and are classified into several categories based on their mechanism of action: antacids, H₂ - receptor antagonists (H₂ RAs), proton pump inhibitors (PPIs), anticholinergics, prostaglandin analogues, mucosal protective agents, and antibiotics for *H. pylori* eradication.^[4,5] Since their introduction in the 1980s, PPIs have demonstrated superior gastric acid suppression compared to

H₂ RAs and are among the most frequently prescribed medication classes across all healthcare settings.^[6]

Despite the widespread use of APUDs globally, only a few studies reflecting their comprehensive utilization patterns are available in Asian countries, including India. Recent concerns have been raised regarding the potential for adverse events due to long-term acid suppression and the economic burden imposed by inappropriate prescribing, particularly when branded drugs are chosen over generics.^[7] Most existing Indian studies have focused on the utilization of a single class of acid suppressants or on diseases in specialty clinics, leaving a gap in the literature on the overall prescription pattern of APUDs across general medicine inpatient settings.

The present study was therefore planned to evaluate the utilization of anti-peptic ulcer drugs in the Department of Medicine of a tertiary care hospital, covering demographic profiles, disease profiles, prescription patterns, and quality indicators such as indication, dosage adequacy, duration, frequency, route of administration, and branded versus generic prescribing.

MATERIALS AND METHODS

Study Design and Setting

This was a cross-sectional, observational study conducted in the Departments of Pharmacology and General Medicine of Justice K. S. Hegde Charitable Hospital, Mangalore, over a period of 12 months from January 2017 to December 2017.

Sample Size

A previous study reported a 24% prevalence of anti-peptic ulcer drug use.^[7] Using the formula $N = Z^2(1-\alpha/2) \times P(1-P)/d^2$, where P = expected prevalence (0.24), d = allowable error (0.05), and α = significance level (0.05), the minimum sample size was calculated as:

$N = (1.96)^2 \times 0.24 \times 0.76 / (0.05)^2 = 280.2$, rounded to 280.

Sample Selection

The total number of patients admitted under the Medicine ward during the study period was 3970. Subjects were selected by simple random sampling using the Research Randomiser software. Numbers were allotted to all 3970 files, from which 280 samples were chosen.

Inclusion Criteria

All in-patients of the General Medicine department with a discharge summary available in the Medical Records department were eligible for inclusion.

Data Collection

Relevant data were obtained from the discharge summaries using a specially designed semi-structured proforma covering: (1) demographic data — name, age, gender, address, inpatient number, and duration of hospital stay; (2) disease data — final diagnosis and co-morbidities; and (3)

pharmacological therapy data — anti-peptic ulcer drugs prescribed (with class), dose, duration of treatment, frequency, route of administration, drug combinations, and drug interactions if any.

Statistical Analysis

Data were entered into Microsoft Excel and analysed using SPSS version 22. Results are presented as frequencies and percentages.

RESULTS

A total of 280 in-patients admitted under the General Medicine department were enrolled in the study. The mean age of the study population was 47.23 ± 17.5 years. Anti-peptic ulcer drugs were prescribed to 229 patients (81.8%).

Demographic Profile

The demographic characteristics of the study population are presented in Table 1 and illustrated in Figures 1 and 2.

Gender Distribution (N = 280)

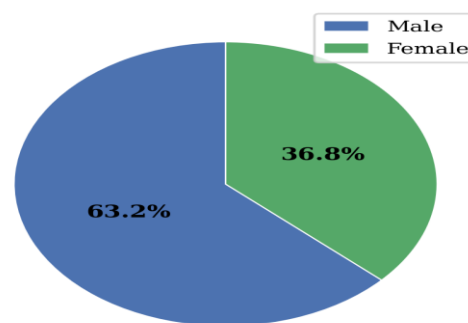


Figure 1: Gender distribution

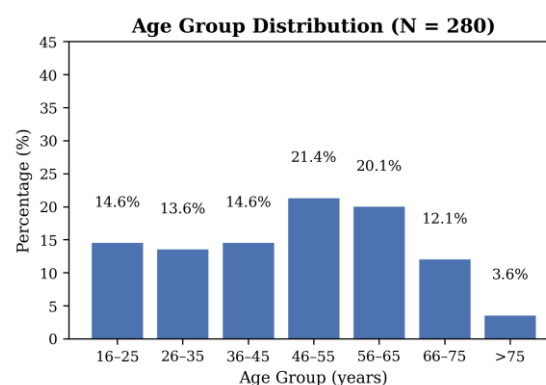


Figure 2: Age group distribution

Of the 280 patients, 177 were males (63.2%) and 103 were females (36.8%). The most common age group was 46–55 years (21.4%, n = 60), followed by 56–65 years (20.1%, n = 56). Patients aged 16–25 years and 36–45 years each constituted 14.6% (n = 41), while the 26–35 years group accounted for 13.6% (n = 38). Patients aged 66–75 years constituted 12.1% (n = 34), and those >75 years constituted 3.6% (n = 10).

With regard to occupation, the largest proportion were manual labourers or individuals engaged in physical work (29.3%, n = 82), followed by unemployed/homemaker/retired individuals (27.1%,

n = 76), officers or office workers (22.5%, n = 63), students (15.4%, n = 43), and professionals (5.7%, n = 16).

Table 1: Demographic Profile of Study Population (N = 280)

Characteristic	Category	n	%
Gender	Male	177	63.2
	Female	103	36.8
Age group (years)	16–25	41	14.6
	26–35	38	13.6
	36–45	41	14.6
	46–55	60	21.4
	56–65	56	20.1
	66–75	34	12.1
	>75	10	3.6
Occupation	Unemployed/Homemaker/Retired	76	27.1
	Manual labourer/Physical work	82	29.3
	Officers/Office work	63	22.5
	Students	43	15.4
	Professional	16	5.7

Disease Profile and Comorbidities

The distribution of final diagnoses and comorbidities is shown in Table 2. The most common diagnostic category was infectious/endocrine diseases (“Others”), accounting for 48.9% (n = 137) of the study population. Respiratory system diseases were diagnosed in 18.6% (n = 52), gastrointestinal system diseases in 14.6% (n = 41), cardiovascular diseases in 11.1% (n

= 31), and central nervous system diseases in 6.8% (n = 19).

Comorbidities were present in 194 patients (69.3%). Gastrointestinal comorbidities were the most frequent, affecting 44.6% (n = 125), followed by respiratory system comorbidities (21.1%, n = 59), cardiovascular comorbidities (2.9%, n = 8), and other comorbidities (0.7%, n = 2). Notably, 30.7% of patients (n = 86) had no recorded comorbidity.

Table 2: Disease Profile and Comorbidities (N = 280)

Parameter	Category	n	%
Final diagnosis (system)	Respiratory system	52	18.6
	Gastrointestinal system	41	14.6
	Cardiovascular system	31	11.1
	Central nervous system	19	6.8
	Others (Infectious/Endocrine)	137	48.9
Comorbidity status	Any comorbidity present	194	69.3
	No comorbidity	86	30.7
Type of comorbidity	Gastrointestinal system	125	44.6
	Respiratory system	59	21.1
	Cardiovascular system	8	2.9
	Others	2	0.7

APUD Prescription Pattern

The prescription pattern of anti-peptic ulcer drugs is presented in Table 3 and illustrated in.

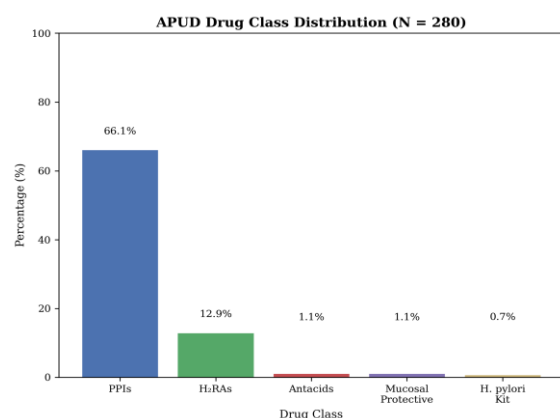


Figure 3: Anti-peptic ulcer drug class distribution

Among the 280 patients, APUDs were prescribed to 229 (81.8%). Proton pump inhibitors (PPIs) were

the most frequently prescribed drug class, accounting for 66.1% (n = 185) of all patients, followed by H₂-receptor antagonists (12.9%, n = 36), antacids (1.1%, n = 3), mucosal protective agents (1.1%, n = 3), and antibiotics for H. pylori eradication (0.7%, n = 2).

Among APUD-prescribed patients (n = 229), the most commonly prescribed specific drug was pantoprazole (48.5%, n = 111), followed by omeprazole (24.5%, n = 56), ranitidine (15.7%, n = 36), rabeprazole (6.5%, n = 15), esomeprazole (1.3%, n = 3), antacid (unspecified) (1.3%, n = 3), sucralfate (1.3%, n = 3), and H. pylori eradication kit (0.9%, n = 2).

A single-drug regimen was prescribed in 80.8% of APUD-prescribed patients (n = 185), while 19.2% (n = 44) received a combination regimen. Among combination regimens, the most common was pantoprazole 40 mg + domperidone 30 mg (93.2%,

n = 41), followed by rabeprazole 10 mg + mg + levosulpiride 75 mg (2.3%, n = 1). dicyclomine 10 mg (4.5%, n = 2) and rabeprazole 20

Table 3: APUD Prescription Pattern

Parameter	Category	n	%
APUD prescribed (N = 280)	Yes	229	81.8
	No	51	18.2
Drug class (N = 280)	Proton pump inhibitors	185	66.1
	H ₂ -receptor antagonists	36	12.9
	Antacids	3	1.1
	Mucosal protective agents	3	1.1
	Antibiotics (H. pylori kit)	2	0.7
Specific drug (N = 229)	Pantoprazole	111	48.5
	Omeprazole	56	24.5
	Ranitidine	36	15.7
	Rabeprazole	15	6.5
	Esomeprazole	3	1.3
	Antacid (unspecified)	3	1.3
	Sucralfate	3	1.3
	H. pylori kit	2	0.9
Regimen type (N = 229)	Single drug	185	80.8
	Combination	44	19.2
Combination type (N = 44)	Pantoprazole 40 mg + Domperidone 30 mg	41	93.2
	Rabeprazole 10 mg + Dicyclomine 10 mg	2	4.5
	Rabeprazole 20 mg + Levosulpiride 75 mg	1	2.3

Prescription Quality Indicators

The quality indicators of APUD prescriptions are presented in **Table 4**. An appropriate indication for APUD therapy was documented in 88.2% of prescriptions (n = 202), while 11.8% (n = 27) lacked a documented indication.

Dosage adequacy was assessed among APUD-prescribed patients (n = 229). An adequate dosage was observed in 94.3% of prescriptions (n = 216), and an inadequate dosage in 5.7% (n = 13).

The most common treatment duration was 8–14 days (56.3%, n = 129), followed by 1–7 days

(22.3%, n = 51), 15–21 days (20.1%, n = 46), 22–28 days (0.9%, n = 2), and >28 days (0.4%, n = 1). The mean duration of treatment was 11.4 days.

Once-daily (OD) dosing was prescribed in 86.5% of patients (n = 198), and twice-daily (BD) dosing in 13.5% (n = 31). The oral route of administration was used in 61.1% (n = 140) and the intravenous route in 38.9% (n = 89). Branded drugs were prescribed in 77.7% (n = 178) and generic drugs in 22.3% (n = 51).

Table 4: Prescription Quality Indicators (N = 229)

Indicator	Category	n	%
Indication documented	Yes	202	88.2
	No	27	11.8
Dosage adequacy	Adequate	216	94.3
	Inadequate	13	5.7
Treatment duration	1–7 days	51	22.3
	8–14 days	129	56.3
	15–21 days	46	20.1
	22–28 days	2	0.9
	>28 days	1	0.4
Dosing frequency	Once daily (OD)	198	86.5
	Twice daily (BD)	31	13.5
Route of administration	Oral	140	61.1
	Intravenous	89	38.9
Drug type	Branded	178	77.7
	Generic	51	22.3

DISCUSSION

The present study evaluated the utilization pattern of anti-peptic ulcer drugs (APUDs) among 280 in-patients in a tertiary care hospital. The demographic profile showed a male predominance (63.2%), consistent with Indian studies by Krishna Kumar Jha

et al (55.75% male),^[8] and Nasrin Shahsavani et al (65.55% male),^[9] but contrasting with studies from Nigeria (Kadiri et al, 74.6% female),^[10] and Pune (Priti Pravin Dhande et al, 52% female),^[11] reflecting regional demographic variation. The mean age of 47.23 years was comparable to Machado-Alba et al in Colombia (54.4 years),^[12] Dhande et al reported a peak in the 21–30 years age group

(29.2%),^[11] while Shahsavani et al observed the highest proportion in the 70–79 years group (17.22%),^[9] likely due to differences in morbidity patterns and healthcare-seeking behaviour across populations.

The most common occupation was manual labour/physical work (29.3%), followed by unemployed/retired individuals (27.1%). Kadiri et al reported 32.1% unemployed/retired,^[10] and Dhande et al reported 46.9% in this category,^[11] underscoring the socioeconomic vulnerability of the study populations. Infectious/endocrine diseases were the most frequent final diagnosis (48.9%), similar to Deepak Chopra et al (44.4% infectious diseases),^[13] and Brij Bhushan Tyagi et al (17.1% infectious diseases),^[14] reflecting the high infectious disease burden in Indian hospital settings consistent with global health statistics.^[15] Comorbidities were present in 69.3% of patients. Kadiri et al reported comorbidities in approximately 37% of their Nigerian cohort,^[10] while Almeman et al in Malaysia observed a 52% comorbidity prevalence with cardiovascular diseases as the most common (~19%),^[16] the higher comorbidity rate in our study may be attributable to the older age distribution of our population.

APUDs were prescribed to 81.8% of patients (n = 229), a rate comparable to Meli et al in Italy (62.9%),^[17] but markedly higher than Jill Murie et al in the UK (15%),^[18] suggesting more liberal prescribing in our setting. Proton pump inhibitors (PPIs) were the dominant drug class (66.1%), in line with Vipin Kumar Singh et al (74% PPIs),^[19] and Kadiri et al (82.3% PPIs),^[10] conversely, Almeman et al reported a preference for H₂-receptor antagonists (83%),^[16] reflecting physician prescribing preferences. Among individual drugs, pantoprazole was most frequently prescribed (48.5%), followed by omeprazole (24.5%) and ranitidine (15.7%). Dhande et al similarly reported pantoprazole as the preferred drug (27%),^[11] whereas Shahsavani et al observed higher omeprazole use (46.9%),^[9] and Machado-Alba et al reported omeprazole in 97.8% of PPI prescriptions,^[12] indicating substantial geographic variation in drug selection. Single-drug regimens were preferred (80.8%), consistent with Dhande et al (68.3% single drug).^[11] Among combination therapies, pantoprazole + domperidone was the most common (93.2%), mirroring Dhande et al (68.42% PPI + prokinetic FDC),^[11] likely due to the frequent co-occurrence of nausea and vomiting with peptic ulcer disease.

Prescription quality indicators revealed that an appropriate indication was documented in 88.2% of APUD prescriptions, substantially higher than the 50.1% reported by Raffaella Scagliarini et al,^[20] 45.9% by Christopher Tze Wei Chia et al,^[21] and 29.1% by Meli et al,^[17] suggesting better adherence to prescribing guidelines in our institution. Adequate dosage was observed in 94.3% of patients, exceeding the 62.3% reported by Kadiri et al,^[10] and

24% by Batuwitage et al,^[22] though the latter studied primary care settings where oversight may be lower. The most common treatment duration was 8–14 days (56.3%, mean 11.4 days), contrasting with Dhande et al (51% prescribed for 1–7 days, 10.33% for 8–14 days),^[11] and Morales Suarez-Varela et al (mean 85 days),^[23] these differences reflect variation in study populations — our study included all medical in-patients, not only those with established peptic ulcer disease. Once-daily dosing predominated (86.5%), whereas Thors et al in Iceland reported twice-daily dosing in 77.2% of prescriptions,^[24] attributable to greater H₂ RA use (typically BD dosing) in their setting. The oral route was preferred (61.1%), similar to Shahsavani et al (64.7% oral),^[9] and Dhande et al (95% oral),^[11] intravenous administration was used in 38.9% of our patients, reflecting the inpatient setting. Branded drugs were prescribed in 77.7% of cases, comparable to Dhande et al (98.7% branded),^[11] whereas Kadiri et al reported 52.4% generic use,^[10] highlighting the influence of hospital drug procurement policies on prescribing patterns.

Limitations

This study was conducted exclusively among inpatients of the Department of Medicine at a single tertiary care hospital; the findings may not be generalizable to outpatient settings, other departments, or hospitals with different formularies. The cross-sectional design precludes assessment of prescribing trends over time, and data were collected retrospectively from discharge summaries, which may be subject to documentation gaps.

CONCLUSION

The present study demonstrates a high prevalence of APUD prescribing in a tertiary care inpatient setting, with PPIs — particularly pantoprazole — being the most commonly used drug class. While indication documentation and dosage adequacy were satisfactory in the majority of prescriptions, the predominance of branded drugs and the widespread use of PPIs warrant continued pharmacovigilance and the development of institution-specific prescribing guidelines to promote cost-effective and evidence-based acid-suppressive therapy.

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