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Effectiveness and Satisfaction With Rabeprazole in Acid Peptic Disorders: Insights From Real World Observational Study, Power 2.0

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ABSTRACT

Introduction: Acid peptic disorders (APDs), including gastroesophageal reflux disease (GERD) and peptic ulcer disease (PUD), are prevalent conditions that significantly impair quality of life. Proton pump inhibitors (PPIs) are a cornerstone of APD management, but variability in their effectiveness necessitates evaluation, especially in the Indian context, due to lack of data.

Methods: The POWER 2.0 study is a multicenter, prospective, observational, non-interventional study that enrolled patients with APDs under routine clinical practice, including treatment-naïve and existing PPI users. Data were collected at baseline (day 0) and after 30 days. The primary objective was to document demographics, clinical presentation, and treatment-related outcomes. Secondary objectives evaluated risk factors, severity, comorbidities, PPI usage-patterns, and satisfaction levels.

Results: A total of 622 patients, mean age 44.2±11.93 years, predominantly male (70.9%), were enrolled across 75 Indian sites. GERD was the most diagnosed condition (70.1%). Alcohol use (p=0.0404) and sedentary lifestyle (p=0.0056) were significantly associated with APD severity. Rabeprazole was prescribed most often for treatment-naïve (78.3%) and existing PPI users (39.0%). Among 197 existing PPI users, 56.9% required a switch, mainly from pantoprazole (55.4%). Most switched to rabeprazole (88.3%) due to inadequate symptom relief. Only 7 rabeprazole users required a further switch. Symptom regression occurred in >90% of switched patients and 84.5% of treatment-naïve users and high satisfaction rates.

Conclusions: Rabeprazole shows effectiveness in symptom relief and clinician preference. The minimal effect of CYP2C19 metabolism on rabeprazole may have contributed to its consistent efficacy across diverse patient populations, including those switching from other PPIs.

Keywords: Proton pump inhibitors; gastroesophageal reflux; peptic ulcer; patient satisfaction; rabeprazole

INTRODUCTION

Acid peptic disorders (APD) are among the common conditions reported in daily clinical practice.[1] APD significantly impairs well-being, aspects of health-related quality of life, and productivity.[2,3] APD stems from distinct but overlapping pathogenic processes that result in either increased acid production or reduced mucosal protection.[3] This overlap is associated with the worsening of physical health and quality of life.[4] Typical symptoms of APDs encompass a range of manifestations that can vary in severity and presentation. These disorders typically encompass two main conditions: gastroesophageal reflux disease (GERD) and peptic ulcer disease (PUD). A cross-sectional survey of 1000 clinicians across India who treated patients with APD in their practice reported approximately 39.2% and 37.1% of patients with GERD and PUD, respectively.[1]

Management of APDs involves a multifaceted approach that includes pharmacological, lifestyle, and sometimes surgical interventions. Proton pump inhibitors (PPIs) have been a cornerstone in the management of acid-related disorders for years, offering safe and effective acid suppression.[5] PPIs work by reducing acid secretion in the stomach. These drugs are absorbed in the proximal small intestine and, once in circulation, target and inhibit the proton pump (H+/K+ ATPase enzyme) in the parietal cells in the stomach. This enzyme is crucial for the final step of acid secretion into the stomach. PPIs are prodrugs that become active only after an acid-catalyzed transformation in the acidic secretory canaliculi of the parietal cells.[6]

PPIs are primarily metabolized by hepatic P450 enzymes, with cytochrome P450 2C19 (CYP2C19) playing a major role in their degradation. Despite the overall effectiveness and safety profile of PPIs, some patients do not adequately respond to these medications or manifest adverse events. Variations in the metabolism of PPIs explain why their efficacy can differ among individuals.[7] It is well established that the extent of acid suppression is significantly influenced by variations in the pharmacokinetic (PK) parameters of PPIs, particularly the area under the serum (or plasma) concentration vs. time curve (AUC).[8,9] Although many non-genetic factors can affect PPIs, the variability due to the CYP2C19 genotype is substantial and accounts for a significant portion of the PK variability of PPIs. For instance, a study by Gawronska-Szklarz *et al.* showed that the CYP2C19 genotype accounted for 57% of the variability in the population clearance of pantoprazole in adults.[10] The genotypes of CYP2C19 include rapid extensive metabolizer, intermediate metabolizer, and poor metabolizer.[11] It has been reported that the prevalence of different genotypes varies across different ethnic groups, which can affect how PPIs are processed.[7]

Rabeprazole is different from other PPIs due to its unique pharmacokinetic properties. Unlike other PPIs, rabeprazole undergoes minimal hepatic metabolism via the CYP2C19 enzyme and is primarily converted non-enzymatically into a thioether.[12] This characteristic ensures a consistent treatment response across diverse patient populations, irrespective of genetic variations in CYP2C19. Such genetic polymorphisms significantly influence the metabolism and efficacy of other PPIs, leading to variability in therapeutic outcomes.[7]

Although the pathophysiology has been extensively studied, there is a lack of literature evidence reporting the clinical presentation and aspects of management of patients with APD in India.[1] The scope of this study is to bridge the information gap and provide experience-driven data to facilitate understanding of APD patient

demographics, clinical presentation, and management, along with compliance and satisfaction levels with the usage of PPIs in India.

METHODS

Study design

This multicenter, prospective, observational, and non-interventional study was designed to understand the demographics, diagnosis, clinical presentation, and management of patients with APDs in India. The study was planned across 75 sites, enrolling participants under routine clinical practice without any specific intervention. Data collection involved two visits: an enrollment visit (day 0) and a follow-up visit 30 days later. Informed consent was obtained from the participants, ensuring they understood the study's purpose and procedures and agreed to the use of their data. The participants were free to withdraw from the study at any time without justification and without losing the right to future medical care. There were no prohibited medications during the study and no treatments were withheld from participants. The study received approval from relevant ethics committees. This study was approved by the "Royal Pune Independent Ethics Committee" on 28 Jul 2022. This study was carried out in compliance with the study protocol, the recommendations on biomedical research on human patients of the Declaration of Helsinki, International Committee on Harmonization of Good Clinical Practice (ICH-GCP) Guidelines, and national requirements of the participating country (ICH E6(R2) 'Guideline for Good Clinical Practice, ICMR Guidelines (2017), New Drugs and Clinical Trials Rules 2019—G.S.R.227(E). This study was registered on 12/09/2022 with number "CTRI/2022/09/045446".

Study population

The study population for this study consisted of patients diagnosed with APD who were managed under routine clinical practice without any specific interventions mandated by the study protocol. The inclusion criteria covered participants of either sex, aged 18 years or older, and willing and able to sign a data disclosure consent form. Importantly, participants were required to have a clinical diagnosis of APD, which included conditions such as GERD and PUD. The study included both treatment-naïve patients, who had not used any PPIs for at least 8 weeks, and existing PPI users, who had been using a PPI for the last 2–4 weeks. The study initially planned to enroll up to 600 participants. Participants were excluded if they did not meet the inclusion criteria or if their medical history suggested they were unsuitable for the study.

Study objectives

The primary objective of the study was to document and analyze clinical presentation, treatment outcomes, demographics, geographical distribution, risk factors, diet patterns, lifestyle, and diagnosis of patients with APD in India. The secondary objectives included documenting overlapping gastrointestinal conditions, comorbidities, association between risk factors and APD severity, PPI usage pattern, patient compliance, symptomatic improvement, and satisfaction levels.

Study assessments and data collection

The data collection process involved two key visits. At enrollment, baseline data including demographics, clinical symptoms, comorbidities, risk factors, lifestyle, and dietary habits were recorded. For existing patients, information about their current PPI usage, including duration and satisfaction levels, was gathered. Changes in medication were documented, along with reasons for such changes. For treatment-naïve patients, details about the recommended PPI were recorded. The follow-up visit was conducted in person 30 days after the enrollment visit. During this visit, patient compliance, symptom improvement, and satisfaction with the PPI were recorded. To ensure data confidentiality and integrity, all personal identifiers were removed at the source. Each participant was assigned a unique identifier to maintain anonymity throughout the study. Data were recorded in electronic case report forms (eCRFs) and submitted to the coordinating center via secure web portals. This digital approach facilitated efficient data management and analysis while ensuring data security and compliance with ethical standards.

Statistical analysis

Continuous data were analyzed using descriptive statistics, including the number of patients, mean, standard deviation, median, minimum, and maximum values. Categorical data were summarized using frequencies and percentages. Regression analysis was used to determine the association between the severity of APD and risk factors. All statistical tests were performed using validated statistical software with a two-tailed alpha of 0.05. Missing data were treated as missing, with no imputation performed to replace missing values.

RESULTS

Baseline characteristics

A total of 622 patients were enrolled in the study. The first patient's first visit was on 20 September 2022, and the last patient's last visit was on 05 April 2023. The mean age of the patients was 44.2±11.93 years. The gender distribution was predominantly male, with 441 males (70.9%) and 181 females (29.1%). Patients were fairly distributed between rural and urban areas, with 284 patients (45.7%) residing in rural areas and 338 patients (54.3%) in urban areas. The severity of APD was categorized into three grades, with most patients in the grade 2 category (grade 1 [172 patients, 27.65%], grade 2 [294 patients, 47.3%], and grade 3 [155 patients, 24.9%]). The primary cause of APD among the majority of the patients was GERD, accounting for 436 patients (70.1%). The most common comorbid condition was hypertension (206 patients, 33.1%), followed by diabetes mellitus (179 patients, 28.8%). The patients also exhibited a variety of overlapping gastrointestinal conditions. The most prevalent were gastroduodenal disorders (245 patients, 39.4%), followed by bowel disorders (213 patients, 34.2%) and esophageal disorders (198 patients, 31.8%). The baseline characteristics of the study population are outlined in Table 1.

Table 1: Baseline characteristics of the study population

Characteristic	Category	N=622	Value
Age (years)		Mean ± SD	44.2±11.93
Gender	Male	n (%)	441 (70.9)
	Female	n (%)	181 (29.1)
Residential location	Rural	n (%)	284 (45.7)

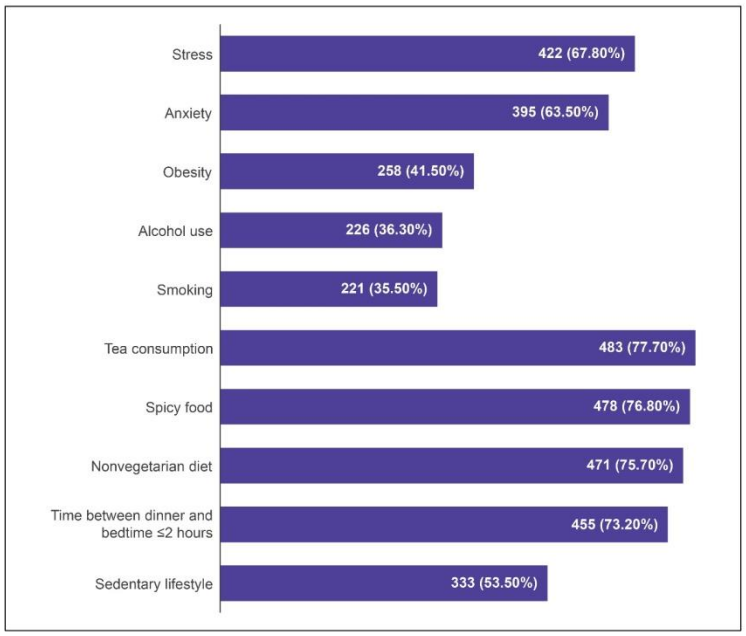
	Urban	n (%)	338 (54.3)
Region	North India	n (%)	171 (27.5)
	West and Central India	n (%)	97 (15.6)
	East and Northeast India	n (%)	129 (20.7)
	South India	n (%)	225 (36.2)
Height (cm)		Mean ± SD	163.9±8.42
Weight (kg)		Mean ± SD	71.0±10.97
BMI		Mean ± SD	26.4±3.97
Patient category based on usage of PPI	Treatment naïve	n (%)	425 (68.3)
	Using PPI for 2–4 weeks	n (%)	197 (31.7)
Duration from diagnosis of APD (days)		Mean ± SD	61.2±433.91
Severity of APD: Acid peptic disorder	Grade 1	n (%)	172 (27.65)
	Grade 2	n (%)	294 (47.3)
	Grade 3	n (%)	155 (24.9)
	Missing	n (%)	1 (0.2)
Diagnosis of APD: APD: Acid peptic disorder	Duodenal ulcer	n (%)	31 (5.0)
	Gastric ulcer	n (%)	92 (14.8)
	GERD: Gastroesophageal reflux disease	n (%)	436 (70.1)
	Non-ulcer dyspepsia	n (%)	42 (6.8)
	Peptic ulcer disease: non-specified	n (%)	20 (3.2)
	Missing	n (%)	1 (0.2)
Comorbidities	Diabetes mellitus	n (%)	179 (28.8)
	Hypertension	n (%)	206 (33.1)
	Cardiovascular disease	n (%)	55 (8.8)
	Lung disease	n (%)	25 (4.0)
	Liver disease	n (%)	67 (10.8)
	Others	n (%)	34 (5.5)
Overlapping gastrointestinal conditions	Esophageal disorders	n (%)	198 (31.8)
	Gastroduodenal disorders	n (%)	245 (39.4)
	Bowel disorders	n (%)	213 (34.2)
	Centrally mediated disorders of gastrointestinal pain	n (%)	57 (9.2)
	Gallbladder and sphincter of Oddi disorders	n (%)	39 (6.3)
	Anorectal disorders	n (%)	19 (3.1)
Diagnostic modalities	Clinical symptoms	n (%)	457 (73.5)
	Empirical trial of PPI: Proton pump inhibitor	n (%)	107 (17.2)
	Questionnaire for GERD	n (%)	284 (45.7)
	Esophagogastroduodenoscopy	n (%)	128 (20.6)
	24-hour pH monitoring	n (%)	4 (0.6)
	Helicobacter pylori testing	n (%)	105 (16.9)
	Radiological imaging	n (%)	63 (10.1)
	Upper GI: Gastrointestinal endoscopy	n (%)	293 (47.1)

Abbrevations:

APD: Acid peptic disorder; GERD: Gastroesophageal reflux disease; GI: Gastrointestinal; PPI: Proton pump inhibitor.

Risk factors and APD severity

The study identified several prevalent risk factors associated with APD among the 622 patients (Supplementary Figure 1) Univariate analysis revealed significant associations between APD severity and anxiety (β=0.715, p=0.0222), alcohol use (β=1.201, p=0.0001), consumption of spicy food (β=0.875, p=0.0153), and a non-vegetarian diet (β=1.139, p=0.0014) (Table 2). Additionally, having dinner within 2 hours of bedtime (β=0.692, p=0.0434) and a sedentary lifestyle (β=0.790, p=0.0084) were linked to APD severity. In multivariate analysis, being a current alcohol user (β=1.067, p=0.0404) and leading a sedentary lifestyle (β=1.356, p=0.0056) remained significantly associated with the severity of APD.



Supplementary Figure 1: Risk factors for acid peptic disorders

Table 2: Univariate and multivariate regression analysis for association between severity of APD and risk factors

Co-existing parameters	Unstandardized coefficient β	Standard error	p-value
Univariate analysis			
Stress	0.571	0.325	0.0793
Anxiety	0.715	0.312	0.0222
Obesity	0.389	0.304	0.2017
Alcohol use (past or present)	1.201	0.307	0.0001
Current alcohol user	1.172	0.525	0.0268
Smoking (past or present)	0.577	0.312	0.0648
Current smoker	0.413	0.587	0.4826

Tea consumption	0.376	0.379	0.321
Consumption of spicy food	0.875	0.36	0.0153
Non-vegetarian diet	1.139	0.355	0.0014
Dinner within 2 hours of bedtime	0.692	0.342	0.0434
Sedentary lifestyle	0.79	0.299	0.0084
Multivariate analysis			
Current alcohol user	1.067	0.517	0.0404
Sedentary lifestyle	1.356	0.484	0.0056

PPI usage and compliance

Among the participants, 425 (68.3%) were treatment-naïve, while 197 (31.7%) had been using PPIs for 2–4 weeks. Among the 197 patients already on PPI therapy, rabeprazole was the most commonly prescribed PPI used by 77 patients (39.0%). At the time of enrollment, 112 patients (56.8%) experienced a change in their PPI prescription, while 85 patients (43.1%) continued with their existing PPI. The most frequent reason for changing PPI was no relief of symptoms (88 patients, 78.5%). For those who switched PPIs at enrollment, rabeprazole was the preferred choice, prescribed to 99 patients (88.3%). Only 7 (6.3%) of the rabeprazole users required a switch to other PPIs. The details of PPI prescription among existing users are outlined in Table 3.

Table 3: Rabeprazole was the most commonly prescribed PPI among both the treatment-naïve patients and existing PPI users who switched to a different PPI

PPI usage for an existing patient	Statistics/category	Values, n (%)
Name of PPI prescribed before enrollment (n=197)	Rabeprazole	77 (39.0%)
	Pantoprazole	72 (36.5%)
	Omeprazole	20 (10.1%)
	Esomeprazole	28 (14.2%)
Change in PPI at the time of enrollment (n=197)	Yes	112 (56.8%)
	No	85 (43.1%)
Reason for change in PPI (n=112)	No relief in symptoms	88 (78.5%)
	Cost-effective	8 (7.1%)
	Therapeutic strategy	29 (25.8%)
	Symptomatic improvement	32 (28.5%)
Name of the new PPI prescribed (switched to) at enrollment (n=112)	Rabeprazole	99 (88.3%)

	Pantoprazole	2 (1.7%)
	Omeprazole	3 (2.6%)
	Esomeprazole	6 (5.3%)
	Others	2 (1.8%)
PPI prescribed in combination with a prokinetic (n=197)	Yes	71 (36.0%)
	No	126 (63.9%)
PPI prescription among treatment-naïve patients		
Name of PPI prescribed at enrollment (n=425)	Rabeprazole	333 (78.3%)
	Pantoprazole	54 (12.7%)
	Omeprazole	8 (1.8%)
	Esomeprazole	27 (6.3%)
	Others	3 (0.7%)
PPI prescribed in combination with a prokinetic (n=425)	Yes	128 (30.1%)
	No	297 (69.9%)

PPI: Proton pump inhibitor

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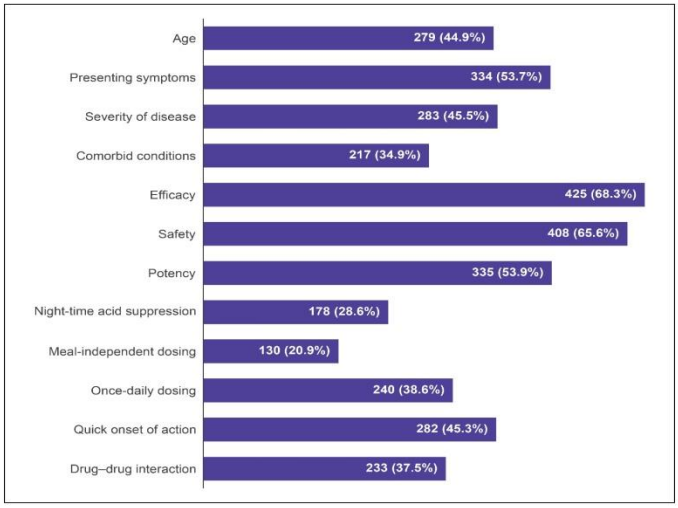
For the 425 treatment-naïve patients, rabeprazole was the most frequently prescribed PPI, used by 333 patients (78.3%), followed by pantoprazole in 54 patients (12.7%), esomeprazole in 27 patients (6.3%), omeprazole in 8 patients (1.8%), and other PPIs in 3 patients (0.7%) (Table 3). These results indicate a strong preference of clinicians for rabeprazole among both existing and treatment-naïve patients. Regarding compliance of patients with prescribed PPI (existing PPI users), 90.8% of patients took the PPI as prescribed. Compliance at the follow-up visit was 98.7%. The most frequent factor influencing the choice of PPI among patients with APD was efficacy (68.3%), followed by safety (65.6%) (Supplementary Figure 2).



Supplementary Figure 2: Factors influencing the choice of PPIs

Symptom evaluation and treatment outcome

Assessment of symptom improvement among existing PPI users who switched to rabeprazole showed substantial reductions in symptom severity (as indicated by the decrease in the number of patients with grades 2, 3, 4, and 5) in the majority of patients (>90% improvement) (Table 4). A similar trend in symptomatic improvement was observed among treatment-naïve patients prescribed various PPIs, with rabeprazole showing consistently better improvement compared to other PPIs across all symptoms (Figure 1a and Supplementary Table 1). The mean improvement score was 7.3% higher with rabeprazole compared to other PPIs, with heartburn showing the maximum positive difference (13.4%).

Supplementary Table 1: Improved symptom regression among treatment naïve patients who received rabeprazole compared to other PPIs

Presenting symptoms	PPI	Initial visit (Grade 2–5)	Follow-up visit (Grade 2–5)	Improved (n)	% improved
Heartburn	Rabeprazole	277	47	230	83
	Others	69	21	48	69.6
Regurgitation	Rabeprazole	255	42	213	83.5
	Others	62	13	49	79
Epigastric pain	Rabeprazole	245	35	210	85.7
	Others	60	13	47	78.3
Bloating and eructation	Rabeprazole	239	38	201	84.1
	Others	67	17	50	74.6
Sleep disturbance	Rabeprazole	237	43	194	81.9
	Others	65	15	50	76.9
Nausea	Rabeprazole	222	32	190	85.6
	Others	57	13	44	77.2
Vomiting	Rabeprazole	199	28	171	85.9
	Others	54	12	42	77.8
Early satiety	Rabeprazole	220	34	186	84.5

	Others	56	10	46	82.1
Abdominal discomfort	Rabeprazole	250	33	217	86.8
	Others	77	16	61	79.2
Post-prandial fullness	Rabeprazole	230	37	193	83.9
	Others	58	13	45	77.6

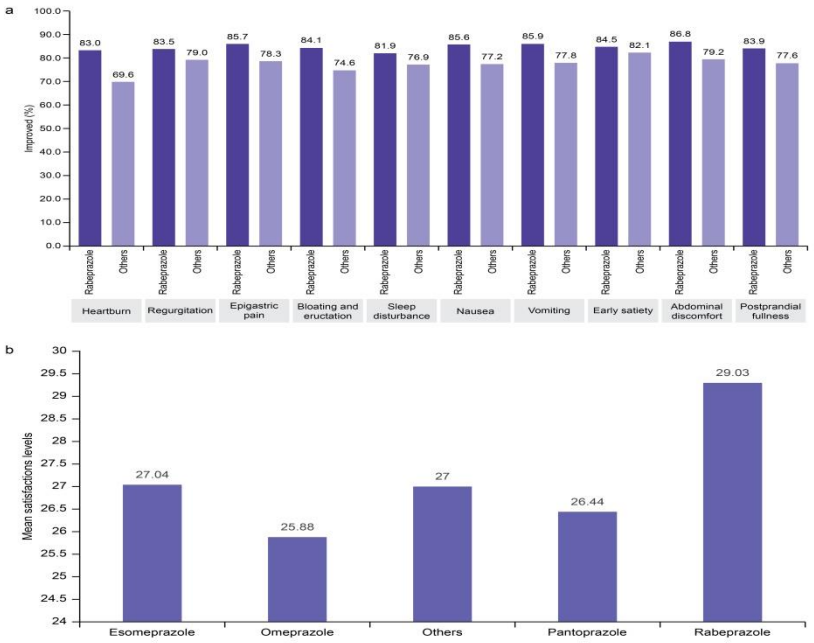


Figure 1a: Consistently better symptom regression with rabeprazole use was seen across all presenting symptoms among treatment-naïve patients when compared to other PPIs; **Figure 1b:** Rabeprazole resulted in maximum satisfaction levels among treatment-naïve patients when compared to other PPIs

Table 4: Switch from other PPIs to rabeprazole resulted in symptomatic improvement among existing PPI users

Presenting symptoms	**Initial visit (Grades 2–5)**	**Follow-up visit (Grades 2–5)**	**Improved**	**% Improved**
Heartburn	93	9	84	90.3
Regurgitation	85	4	81	95.3
Epigastric pain	77	4	73	94.8
Bloating and eructation	82	6	76	92.7
Sleep disturbance	74	5	69	93.2
Nausea	60	2	58	96.7
Vomiting	56	1	55	98.2
Early satiety	72	4	68	94.4
Abdominal discomfort	79	5	74	93.7
Post-prandial fullness	74	5	69	93.2

Satisfaction levels

Satisfaction levels among existing PPI users who switched to different PPIs, as well as among treatment-naïve patients, are shown in Table 5 and Figure 1b. Among the existing users, those who switched from pantoprazole to rabeprazole (57 patients, 50.9%) experienced a mean change in satisfaction score of 9.74±7.28 (48.7%). Patients switching from other PPIs to rabeprazole reported an average improvement of 10.38±6.04 (57.2%). For treatment-naïve patients, rabeprazole was associated with the highest satisfaction levels, with a mean score of 29.03±3.27 among 333 patients. This was followed by esomeprazole with a mean score of 27.04±3.98 (27 patients), pantoprazole with a mean score of 26.44±4.1 (54 patients), and omeprazole with a mean score of 25.88±4.49 (8 patients).

Table 5: Improvement in satisfaction scores/levels after the switch to rabeprazole.

PPI at baseline	Switched to	N (%)	Mean±SD change in satisfaction score	Percentage change in satisfaction score
All other PPIs	Rabeprazole	99	10.38±6.04	57.2
Pantoprazole	Rabeprazole	57	9.74±7.28	48.7

SD: Standard deviation.

DISCUSSION

The findings of this study provide significant insights into the clinical presentation, treatment outcomes, and management patterns of APD in India. The demographic analysis showed a predominantly male population and a fairly even distribution between rural and urban areas. The occurrence of GERD and PUD has been reported to be more common in males than females and is aligned with previous studies by Malik *et al.*[13] and Antunes *et al.*.[14] The diagnosis of APD was primarily based on clinical symptoms, as has been previously reported.[1]

This study highlighted the significant role of PPIs in the management of APD, with rabeprazole being the most commonly prescribed PPI among both treatment-naïve patients and those who switched from other PPIs. The most common reason for the switch was a lack of symptom relief, which improved after the switch to rabeprazole. The high satisfaction levels and substantial symptomatic improvement reported by patients on rabeprazole reinforce its effectiveness and preference among clinicians and patients. An association between patient satisfaction and GERD symptom resolution has been reported, which suggests patient satisfaction can be a valuable endpoint for evaluating treatment success.[15]

PPIs are primarily metabolized in the liver by the CYP2C19 enzyme, with CYP3A4 also playing a minor role.[7] Studies have shown that CYP2C19 is responsible for over 80% of the metabolism of omeprazole, lansoprazole, and pantoprazole.[16] Dexlansoprazole, the R-enantiomer of lansoprazole, undergoes metabolism through hydroxylation by CYP2C19 and oxidation to a sulfone metabolite by CYP3A4, indicating a similar metabolic pathway to lansoprazole.[17] *In vitro* and *in vivo* data suggest that CYP2C19 accounts for approximately 70% of esomeprazole clearance and 90% of omeprazole clearance.[18,19]

Rabeprazole is primarily converted nonenzymatically into a thioether, with minimal involvement of CYP2C19 and CYP3A4, making it less susceptible to genetic variations or drug interactions affecting CYP2C19.[12] The

impact of the CYP2C19 pathway on the metabolism of the PPIs has been reported to be in the following order: omeprazole = esomeprazole > pantoprazole > lansoprazole > rabeprazole.[20,21] This sequence supports the observation that the switch from other PPIs to rabeprazole resulted in higher improvements in satisfaction scores, possibly due to variabilities in genotype-associated PPI metabolism. The effectiveness of PPIs in suppressing stomach acid is linked to their plasma concentration and AUC, which are influenced by CYP2C19 metabolic activity. Therefore, genetic variability in CYP2C19 significantly impacts the therapeutic efficacy of PPIs. As rabeprazole is least affected by CYP2C19 among the currently available PPIs, its action is least affected by enzymatic polymorphism, resulting in consistent efficacy as seen in more treatment-naïve patients with higher satisfaction. The patients also reported symptom improvement and higher satisfaction levels when they were switched to rabeprazole from other PPIs compared to switching to other PPIs.

The results also demonstrated improvements in the severity of symptoms across various presenting symptoms, such as heartburn, regurgitation, epigastric pain, and bloating, particularly among patients who switched to rabeprazole. Rabeprazole has been demonstrated to provide greater effectiveness when compared with pantoprazole and esomeprazole in reducing the severity of multiple GERD symptoms.[22] Rabeprazole has been reported to alleviate both daytime and nighttime heartburn in patients with symptomatic GERD. Additionally, it helps address other dyspepsia-related symptoms, such as regurgitation, belching, bloating, early satiety, and nausea.[23] These findings support the effectiveness of rabeprazole in providing symptom relief and enhancing patient satisfaction.

Overall, this study provides comprehensive data on the demographics, clinical presentation, and management of APD in India. The insights gained from this study can be helpful in clinical practice, guiding the choice of PPIs for effective treatment of patients with APD. The study also highlights the need for ongoing research to further understand the complex interplay of genetic, lifestyle, and pharmacological factors in the management of APD.

This study has some limitations. Being an observational study, it is subject to inherent biases such as selection bias and reporting bias, which may affect the generalizability of the findings. The reliance on self-reported data for symptoms and lifestyle factors could lead to inaccuracies due to recall bias. Furthermore, the study population was predominantly male, which may limit the applicability of the results to the broader population. Lastly, the follow-up period was relatively short, providing limited insight into the long-term effectiveness and safety of PPIs and combination therapies in the management of APD. Future studies with longer follow-up periods and more diverse populations are needed to validate and expand upon these findings.

CONCLUSION

This study offers valuable data on the demographics, clinical presentation, and management of APD in India. It underscores the significant burden of GERD and PUD and highlights the effectiveness of rabeprazole in managing these conditions. The study reveals that rabeprazole is highly effective in improving symptoms and achieving high patient satisfaction, making it a preferred choice among clinicians. Such results also underscore the impact of genetic variability, particularly CYP2C19 polymorphism, on the metabolism and efficacy of PPIs, with rabeprazole showing consistent effectiveness as it is least affected by CYP2C19. Addressing the risk factors and variability in response to PPIs can lead to more personalized and effective treatment strategies for

patients with APD. Overall, the POWER 2.0 study provides an understanding of APD management in India and the role of rabeprazole in guiding effective therapeutic approaches.

STATEMENTS

The data mentioned in the manuscript were presented as 2 posters in Asian Pacific Digestive Week 2023.

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STATEMENT OF ETHICS

Study Approval Statement: This study was approved by the Royal Pune Independent Ethics Committee on 28 Jul 2022.

Consent to Participate Statement: Informed consent was obtained from the participants, ensuring they understood the study's purpose and procedures and agreed to the use of their data.

CONFLICT OF INTEREST STATEMENT

Authors Mahesh K Goenka and Shashank Desai have no conflict of interest to declare. Authors Kranthi Kiran Pebbili, Seema Bhagat, Arti Sanghavi, Sagar Katare, Bhavesh Kotak and Sunil Kumar Yadav Yadagiri are full-time salaried employees of Dr Reddy's Laboratories Ltd, Hyderabad, India.

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AUTHOR CONTRIBUTIONS

Conceptualization: MKG, KKP, SD, SB, AS, SK, BK, SKYY; **Data curation:** KKP, SD, SB, SKYY; **Formal analysis:** KKP, SD, SB, SKYY; **Funding acquisition:** KKP, SD, SB, AS, SK, BK, SKYY; **Methodology:** MKG, KKP, SD, SB, AS, SK, BK, SKYY; **Project administration:** SB, AS; **Resources:** KKP, SD, SB, AS, SK, BK, SKYY; **Supervision:** MKG, KKP, SD, SB, AS, SK, BK, SKYY; **Validation:** SB, AS; **Visualization:** MKG, KKP, SD, SB, AS, SK, BK, SKYY; **Writing – original draft**: SKYY; **Writing – review & editing:** MKG, KKP, SD, SB, AS, SK, BK, SKYY.

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