

# Evaluation of Appropriateness of Proton Pump Inhibitors (PPIs) Use in the Region of Sharjah, United Arab Emirates (UAE)

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## Abstract

**Background:** Proton pump inhibitors (PPIs) are drugs that reduce the production of acid in the stomach. Recently, the use of PPI has been increasing among communities, whether with or without prescription. As a part of the healthcare team, the pharmacist should not only dispense medications but also ensure the appropriate use of these medications. Studies conducted within 16 countries showed substantial variation in the appropriateness of the use of PPI drugs. **Aim:** To evaluate the appropriateness of PPIs use in Sharjah, UAE based on surveys answered by pharmacists, physicians, and patients. **Methods:** A cross-sectional survey study was conducted on December 2017 at Sharjah, UAE as an example of information obtained from the Middle East. Two different surveys were conducted on physicians and pharmacists. Both Physicians and Pharmacists were chosen randomly from Yellow Pages. The results obtained from both studies were used to develop a patient's survey, which was distributed among University of Sharjah students, their families and random people at Shopping Malls and Clinics. **Results:** The results obtained from the patients' survey showed that ~39% of PPI users from the region of Sharjah are 25 - 44 years old. Approximately 79% are using PPI according to physicians' prescriptions. Prescriptions' duration is varied between 1 month (39%) and 6 months (22%), where 52% of PPI users ask their physicians to prescribe PPIs when needed. Suggested reasons for the use of PPI included inappropriate food habits (52%), use of other medications (16%) or bacterial infection (13%). Around 52% of the patients did not receive any recommendations regarding the deprescribing of PPIs. According to the pharmacists' surveys, an average sale of 5 - 10 PPI packages is reported per

day, and around 50% are sold without a prescription. Most pharmacists were not fully aware of the health conditions and side effects of PPI drugs. On the other hand, physicians' surveys showed that PPIs were mainly prescribed in the case of GERD and ulcer and for a maximum of 2 - 4 weeks. Approximately 75% of physicians recommend changing regimen by reducing the dose and stopping in case of chronic use of PPIs. **Conclusion:** The results from this survey study indicated that even though most PPI consumers at Sharjah, UAE are well aware of the use of PPI drugs and they follow the instructions given by the Physicians', there is some discrepancy in the information obtained by the physicians, pharmacists, and patients. The reason for this discrepancy may be attributed to the missing role of the pharmacists which is currently just dispensing the medications without appropriate counseling. Thus the appropriate role of the pharmacists should be implemented according to the known international guidelines.

### Keywords

Proton Pump Inhibitors, Deprescribing, Appropriate Use, United Arab Emirates (UAE)

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## 1. Introduction

Proton pump inhibitors (PPIs) are a medication that can be used to reduce stomach acidity and relieve GERD symptoms, treat duodenal or stomach ulcers, treat damage to the lower esophagus caused by acid reflux. In the year 2012, PPIs accounted for nine of the top 100 prescribed medications in Canada [1]. While PPIs had an excellent safety profile, the excessive use of this medication has resulted in some significant health problems. Recent evidence indicates signs of harm associated with the long-term use of PPIs, such as diarrhea, impaired B12 absorption, hypomagnesemia, *Clostridium difficile* infection, hip fractures, and pneumonia, dementia, acute interstitial nephritis and chronic kidney disease where older people might be at higher risk of these conditions [1] [2] [3] [4] [5]. The previous study has indicated overutilization of PPIs for patients in both hospital and community settings and a lack of routine symptom re-evaluation in ambulatory care settings [6]. Given the above-stated risks, it is obvious that we need significant and intensive evidence to guide prescribing/de-prescribing PPIs to patients who do not need to continue using these medications.

Deprescribing is the planned and supervised process of dose reduction or stopping of medication that might be causing harm or might no longer be providing a benefit [7]. The goal of deprescribing is to reduce medication burden and harm while maintaining or improving quality of life. The concept of deprescribing needs the healthcare professional to use shared decision-making. The patients are more likely to engage and cooperate if they understand the rationale for deprescribing at the initiation of medication [8] [9] [10]. Deprescribing or stopping of PPIs includes occasional PPI use, which is defined as "daily intake of

a medication for a predetermined, finite period (usually two to eight weeks) to produce curing of reflux-related symptoms or healing of esophageal lesions following a relapse of the individual's condition; thus mainly attributed to over-the-counter (OTC) use of the PPI drugs [11]. Previous trials related to de-prescribing interventions were done in several European countries and in Australia but have not reliably explored patient preferences, perceptions, or experiences. Furthermore, several studies indicated that de-prescribing leads to reductions in medication usage and cost [9] [12] [13]. The aim of this survey study is to test the appropriate use of PPI drugs in a Middle East region such as Sharjah, UAE in order to fill a gap of the information regarding the use of PPI drugs and hence the possible comparison with other regions in order to develop international guidelines.

## 2. Methods

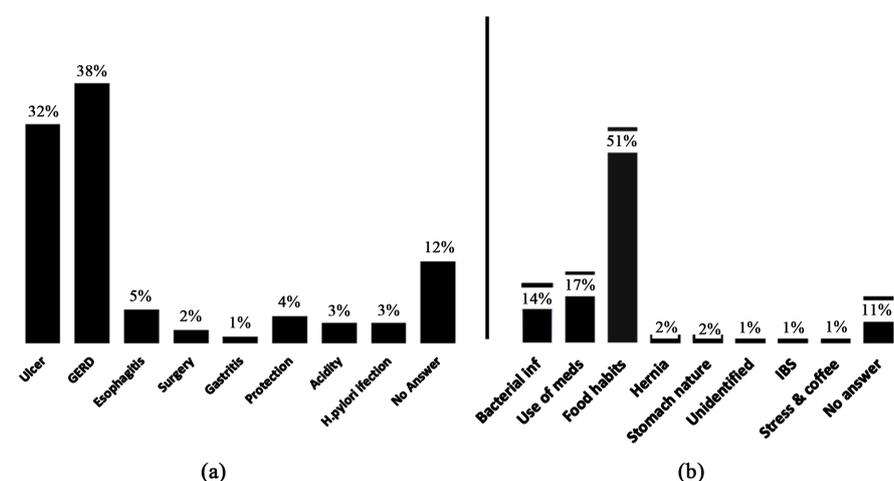
A cross-sectional study made in the city of Sharjah, UAE to investigate the appropriate use of PPI drugs among patients, pharmacists, and physicians. This study also examined reasons behind prescribing PPI. The study was divided into three parts, the pharmacist survey, physician survey, and patient survey. A convenient sample was used for the sake of this pilot study. No statistical sample size calculation was done but a rule of thumb of 50 - 100 participants are good enough was used to determine the minimum sample size. The surveys were constructed by compiling questions from previous studies and modifying it to match the local setting. The surveys were then validated by 5 physicians, 5 pharmacists and 10 patients. There were no major comments or suggestions on the readability and clarity of the questions. The pharmacy survey was distributed by selecting pharmacies randomly using the list of pharmacies in Sharjah, UAE provided through the Yellow Pages. The pharmacies were numbered, and 50 pharmacies were chosen randomly using IBM SPSS Software. Regarding the physician surveys, they were distributed to physicians from different hospitals and clinics in Sharjah. Around 50 physicians were recruited for the study. Based on the data obtained from the pharmacists' and physicians' surveys, a survey for patients using PPI was created. Patient surveys were distributed to university students and their families. Surveys were also distributed among random people in the Shopping Malls, pharmacies, and Medical Centres at Sharjah, UAE. The number of surveys distributed to patients was 100 surveys. Six different questions were used in the pharmacy survey including the rate of PPI sale, the most popular PPI drugs used, the education level of PPI-consumers and the main reasons behind the use of PPI drugs. The physician survey questioners included the reasons for prescribing PPI drugs, the duration of use, the appropriate use by the patient and if the patients follow physicians' instructions, and the side effects in case of chronic use. Patient survey included 9 items such as the age, gender, type of PPI drug used, if they receive appropriate instructions by the physicians and pharmacists and if they follow recommendations for the appropriate use of

the drugs. All three surveys were attached as appendices to the manuscript. The results from the three studies were collected, analyzed using IBM SPSS software.

### 3. Results

Proper use of PPI drugs by people living in Sharjah, UAE.

**Table 1** shows that most (40%) people from Sharjah community using PPI were mainly ranged between 25 - 44 years old, and around 79% are using PPI according to the physicians' recommendations. According to the patient responses, PPI drugs were prescribed mainly for duration of one month (35%) and mainly for GERD (38%) and ulcer (32%) (**Figure 1(a)**).



**Figure 1.** Reasons for use of PPI and development of health conditions. (a) Suggested reasons for the use of PPI drugs; (b) Reasons for the development of acidity health conditions.

**Table 1.** Demographic and health related characteristics of PPI users.

Item	Category	Frequency	Percentage
Age	18 - 24	29	29%
	25 - 44	40	40%
	45 - 64	26	26%
	65+	5	5%
With/ without Prescription	No	21	21%
	Yes	79	79%
Duration of Use	Up to 2 weeks	33	33%
	2 W - 4 W	17	17%
	>4 W	35	35%
	No Answer	15	15%
Usage	Still using	37	37%
	Stopped using	55	55%

Patients using PPI acknowledged that they use PPI due to inadequate food habits (51%), the use of other medications (17%) or due to bacterial infection (14%) (**Figure 1(b)**). Furthermore, 52% of the patients were directly asking the physicians to re-prescribe PPI again. On the other hand, around 52% of patients did not receive any recommendation regarding deprescribing PPI such as stopping the drug, reducing the amount, or taking it when necessary. However, 32% stated that they had received sufficient recommendations about deprescribing their PPI.

**Physicians in Sharjah are well-aware regarding the consequences of the chronic use of PPI and can practice prescribing/deprescribing criteria.**

The results from the physicians' survey showed that physicians are well aware of the use of PPI drugs. Physicians are usually prescribing PPIs for GERD (72.7%), ulcer (42.4%), Pre-operatively (18.8%) and postoperatively (12.12%). They are mainly prescribing PPI for duration of 2 weeks (22%) and more likely for up to 1 month (41%). Around 54.5% of the patients are following physician's recommendations regarding the duration, frequency, and dose of the regimen.

On the other hand, 75.8% of physicians recommend the change of treatment regimen to on-demand, reduced doses, or even stop the use in chronic cases of GERD, heartburn and mild esophagitis. Around 90.9% of physicians do not recommend the use of PPIs without prescription or physician's directions. A significant number of the physicians refused the idea of allowing the patients to use PPI without their consultation mainly due to the side effects of PPI (43%), the inability of the patients to judge the correct dose needed (9.1%) or possible drug-drug interactions (9.1%). Physicians were apparently aware of the side effects and risks of chronic use of PPIs including mal-absorption of vitamins (18%), osteoporosis (15%) and diarrhea (15%). Even though physicians' responses showed many variations in knowledge about risks due to the chronic use of PPI, 15% still had no idea about it.

**Pharmacists' role is inappropriate and not according to the international guidance.**

Surveys collected from Sharjah pharmacies showed that an average of 7 (SD =  $\pm 5.57$ ) packs of PPI is sold per day. Around 50% of PPIs are being dispensed without prescription. Pharmacists declared that 53.3% of the patients purchasing PPI are educated.

Regarding the PPI sales in Sharjah pharmacies, Omeprazole was the most sold PPI (52%) mainly due to its affordability. On the other hand, pharmacists did not show enough knowledge regarding the side effects of PPIs or proper prescribing/deprescribing of PPI drugs.

When statistically analyzing questions related to knowledge of PPIs proper indications and the complications related to chronic PPIs use, the results showed a statistically significant difference between newly graduated pharmacists and pharmacists who have longer experience. Around 83% of newly graduated pharmacists have an excellent knowledge (scored more than 80% correct answers) related to proper indications, and long-term complications of PPIs use

versus only 52% of pharmacists with more than 5 years experience (P-value < 0.001).

#### 4. Discussion

The current data indicated that, even though the patients' survey revealed that patients are well-aware of the use of PPI drugs and they are mostly under control by physicians, there is a little discrepancy when compared with the data obtained from physicians' survey. The data obtained from both surveys may indicate that the counseling role of pharmacists is missing.

Our report indicated that most (~70%) patients from Sharjah using PPI drugs are aware of the use of PPI drugs and they mostly follow the physician's instructions. The use of PPI drugs by Sharjah patients is more appropriate when compared to other studies done in hospitals in Ireland [14], USA [15] or Canada [16]. On the other hand, in consistence with Johnson *et al.* [17], the key international regulations for the use of PPI drugs are adequately followed up by physicians including the short term use, safety and optimal treatment schedule of the drugs. According to the pharmacists' responses, around 50% of the patients are taking PPI drugs without a prescription, and ~50% of them are well-educated. This behavior indicated an effective self-management by OTC PPI drugs in particular with the use of omeprazole. Similar to international reports [18], omeprazole represented the highest PPI sales (>50%) in Sharjah mainly because of its affordable price and activity as suggested by pharmacists.

According to an internationally renowned gastroenterologist meeting on 2009, in Germany, the pharmacists should first confirm the diagnosis based on symptoms and secondly, rule in/out general practitioner referral [19]. However, our results indicated that pharmacists at Sharjah are not performing this job. The reasons behind this may be attributed to either the system does not allow them to do so or they are not fully aware of the PPIs usage, safety, and side effects. On the other hand, pharmacists recently graduated are fully aware of the usage and side effects of PPI drugs in addition to applicable health conditions as evident by the results of the questionnaire analysis. This difference proves that the pharmacists are graduated with excellent information about the indications and proper use of PPIs, but because they do not use this information regularly during their daily practice, they forget them and the level of their knowledge decreased.

#### Study Limitations

The current study has some limitations that are worth mentioning. First of all, the sample size was small and does not allow the generalization of data to the whole residents in Sharjah Emirates. A bigger study should be done which should have a larger sample size and include respondents from all the UAE Emirates (e.g. Dubai, Abu Dhabi, Ajman etc.) so that the results can be representative to the whole UAE population. Also, in depth statistical analysis is required to measure important correlations related to experience and degrees

awarded to physicians and pharmacists. Finally, there were no specific inclusion criteria for the respondents of the study other than being resident or working in Sharjah.

## 5. Conclusion

In general the assessment of PPI drugs usage pattern in Sharjah, UAE showed little discrepancy. According to patients' survey, the use of PPI among people lives in Sharjah is appropriate, regarding the duration of use and knowledge about accurate indications. However, the only small percentage of PPIs users was given recommendations for the act of de-prescribing. Physicians showed professional awareness of the use of PPIs and the risks of their chronic use. They were positive about providing deprescribing recommendations, including reducing the dose of medications, changing the regimen on-demand, or even stopping its use. Pharmacist's involvement in the process is still questionable, where most pharmacists weren't aware of the risks of chronic use of PPI mainly because of their missing role and hence inappropriate use of their experience. Thus, we suggested that pharmacists should be given enough roles to use their experience according to the international guidance and therefore minimize any discrepancy.

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