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Evaluation of Acid-Suppressive Medications Prescribing and Usage in Central Hospitals in Abha Region, Saudi Arabia

Evaluación de la prescripción y uso de medicamentos supresores de ácido en hospitales centrales en la región de Abha, Arabia Saudita

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ABSTRACT

Objective: The aim of this study was to study and assess the indications of acid suppressive drugs and to find out percentage of irrational prescriptions with acid suppressive drugs.

Material/Methods: It is a prospective observational study conducted in the Armed Forces Hospitals Southern Region and Abha Maternity Hospital, both in Abha in Assir region (Saudi Arabia). The sample size of study was 185 patients. The case sheets of the patients' prescription order were reviewed for acid suppressive drugs prescription and relevant data was taken. Patients' age above 18 were identified. The duration of study was 8 weeks, between May and June 2017.

Results: Our results showed that the majority of the prescriptions of proton pump inhibitors (68.1%) were unjustifiable and that proton pump inhibitor was the most commonly prescribed acid suppressive drugs for the patients (97.8%). The frequency of prescribing for the autism spectrum disorders in our study was found to be higher in patients with an existing risk factor and was mostly recommended by physicians as concomitant medications (67.6%). The most common concomitant medications used with the proton pump inhibitors were non-steroidal anti-inflammatory drugs (29.2%) in which aspirin composed 13.5% of the non-steroidal anti-inflammatory drugs prescribed followed by antimicrobials (9.2%).

Conclusion: Acid suppressive drugs are the most commonly prescribed drugs with no proper indications hence irrational. Based on the results of this study, creating awareness about reasonable use of acid suppressive drugs is a necessity.

Keywords: Acid; suppressive; drugs; prescription

RESUMEN

Objetivo: El objetivo de este estudio fue estudiar y evaluar las indicaciones de los medicamentos supresores de ácidos y averiguar el porcentaje de recetas irracionales con medicamentos supresores de ácidos.

Material / Métodos: es un estudio observacional prospectivo realizado en los Hospitales de las Fuerzas Armadas del Sur y en el Hospital de Maternidad Abha, ambos en Abha en la región de Assir (Arabia Saudita). El tamaño muestral del estudio fue de 185 pacientes. Se revisaron las hojas de casos de orden de prescripción de los pacientes para la prescripción de medicamentos supresores de ácido y se tomaron los datos pertinentes. Se identificó la edad de los pacientes mayores de 18 años. La duración del estudio fue de 8 semanas, entre mayo y junio de 2017.

Resultados: nuestros resultados mostraron que la mayoría de las prescripciones de inhibidores de la bomba de protones (68,1%) eran injustificables y que este era el fármaco supresor de ácido más comúnmente prescrito para los pacientes (97,8%). La frecuencia de prescripción para los trastornos del espectro autistas en nuestro estudio, fue mayor en pacientes con un factor de riesgo existente y fue recomendada principalmente por los médicos como medicamentos concomitantes (67,6%). Los medicamentos concomitantes más comunes que se usaron con los inhibidores de la bomba de protones fueron los antiinflamatorios no esteroideos (29.2%) en los cuales la aspirina supuso el 13,5% de los antiinflamatorios no esteroideos prescritos, seguidos por los antimicrobianos (9.2%)

Conclusión: los medicamentos supresores de ácido son los medicamentos más comúnmente recetados sin indicaciones adecuadas, por lo que son irracionales. Basado en los resultados de este estudio, crear conciencia sobre el uso razonable de los medicamentos supresores del ácido es una necesidad.

INTRODUCTION

Acid suppressive drugs (ASDs) either histamine 2 receptor antagonist or, proton pump inhibitors, are some of the most commonly used treatment of acid-related diseases and the prevention of gastric mucosal damage. [1-2]

H_2 receptor antagonists (H2RA) are a class of drugs used to block the action of histamine on parietal cells in the stomach, decreasing the production of acid by these cells. H_2 antagonists are used in the treatment of dyspepsia .[1]

The exceptional symptom control of histamine 2 receptor antagonist or, proton pump inhibitors in acid peptic disorders has led to the indiscriminate use of ASDs for non-specific, upper gastrointestinal symptoms without proper investigation.[3] ASDs form the cornerstone in the management of upper gastrointestinal bleeding and stress ulcer prophylaxis (SUP) in intensive care units (ICU). But many patients admitted to general medical wards (non ICU units) are also routinely placed on these drugs for SUP when neither their admission nor the comorbid diagnoses support their use for either treatment or prophylaxis. [4]

In general, these drugs are considered to be safe. However, Proton pump inhibitors have been known to cause short term adverse effects like headache, dizziness, diarrhea, fatigue, rashes and abdominal pain which have been reported in 5% of the patients taking proton pump inhibitors.[5,6] Furthermore, chronic therapy of PPIs carries an increased risk of bacterial enteritis due to decreased gastric acidity allowing colonization of ingested pathogens and also infection with *Clostridioides difficile*.[7,8] Whereas, Long term use of PPIs have been associated with increased risk of hip fractures, and community acquired pneumonia. [9,10], Such risks are worth taking for life saving drugs that are clearly indicated, but prescribing PPIs that may not be clinically necessary can put patients at risk of complications. Thus, the initiation and the continuous use of ASDs without correct indications will result in significant costs. In spite of the above mentioned concerns with PPIs, they have become one of the most commonly prescribed medicines worldwide. Some reports suggest that up to 60% of patients suffering from dyspepsia are on drugs like PPIs without proper indication. [11, 12] A recent study showed that SUP is over utilized in the non ICU setting and patients are often prescribed ASDs unnecessarily, resulting in significant increase in expenditure. [13] Another hospital-based study revealed that 63% of the patients had no valid indication for PPIs [14]. A recent study in Saudi Arabia showed that 43% of the prescriptions for ASDs were written without an appropriate indication. [15] Similar studies in the past indicated that ASDs were misused in hospitals and in general practice. A study conducted for over one year in a single county hospital in the USA showed that 54% were discharged and given ASDs without proper indication. [16] Similarly, studies published in Europe and Ireland showed that 51% and 57% of their patients respectively, were given PPIs improperly.[17] Based on the previous information, we were concerned about the extent of prescribing and usage of ASDs in Central hospitals in Abha city. Therefore, this study aimed to assess the indications of Acid-Suppressive Medications usage, to find out percentage of irrational prescriptions with Acid-Suppressive Medications (Improper prescriptions without justified indication) and to assess the frequency of usage of Acid-Suppressive Medications along with their dosage.

METHODOLOGY

Study setting

This study was conducted in all wards of Armed Forces Hospitals Southern Region (AFHSR) and of Abha Maternity and Children Hospital, both in Abha in Assir region, Saudi Arabia. This was a prospective observational study to evaluate the prescribing and usage of acid suppressive drugs for inpatient and outpatient pharmacies over period of 8 weeks, between May and June 2017 by using a form that was created for the purpose of this study based on information gathered from previous studies [15, 18]. This study included many of acid suppressive drugs medication orders that was prescribed in all hospital wards, and received by inpatient and outpatient pharmacies over 8 weeks, regardless of administration of the medications, monitoring of medications and patient compliance. The sample size of study was (n=185). The case sheets of the patients or the outpatient prescription order were reviewed for acid suppressive drugs prescription and relevant data was taken. Data analysis was carried out by using of SPSS 16 program. Data were expressed as frequency of categorical variables.

RESULTS

Our results showed that 170 (91.9%) of patients who used acid suppressive drugs were detected in outpatient pharmacy and 15 (8.1%) patients in inpatient department of Assir hospitals. The age distribution percentages in Assir hospital of patients used acid suppressive drugs who were included in our study were (48.1%) for patients between the age of 18 to 20, (21.6%) for patients between the age of 21 to 40, (21.1%) for patients between the age of 41 to 60 and

(9.2%) of patients were above 60 years old. Those patients showed difference acid suppressive drugs prescription percentages between male and females, higher proportion of female (54.6%) than male patients (45.4%) [Table 1].

Many differences in patient diagnoses that lead to acid suppressive drug prescription were detected in Assir Hospitals. The highest patient percentages that were prescribed acid suppressive drug were diagnosed with gastritis and diabetes mellitus (DM) with hypertension (HTN) with percentages of (20%) for both of them. (8.6 %) of patients were diagnosed with HTN, (4.9%) of patients were diagnosed with infection, (4.3%) of patients were diagnosed with pain, (7.6%) of patients were diagnosis with Gastroesophageal reflux disease (GERD). Finally (34.6%) of patients who were prescribed acid suppressive drugs were diagnosed with other different. Proton pump inhibitor were the most commonly prescribed acid suppressive drugs for the patients (97.8%) included in the study in comparison to the remaining (2.2%) of patient of our study who were prescribed histamine 2 antagonist drugs [Table 1].

Table 1. Association between study variables and the Acid suppressive drugs

Study variable	Acid suppressive drugs (%)
18-20	89 (48.1%)
21-40	40 (21.6%)
41-60	39 (21.1%)
Above 60	17 (9.2%)
Gender	
Male	84 (45.4%)
Female	101 (54.6)
Department	
Outpatient	170 (91.9%)
Inpatient	15 (8.1%)
Diagnoses on admission	
Gastritis	37 (20%)
Hypertension	16 (8.6%)
DM with HTN	37 (20%)
Infection	9 (4.9%)
Pain	8 (4.3%)
GERD	14 (7.6%)
Others	64 (34.6%)
Type of drug	
PPIs	181 (97.8 %)
H_2 antacid	4 (2.2%)
Frequency of administration	
Once daily	151 (81.6%)
Twice daily	32 (17.3%)
More than twice daily	2 (1.1%)
Rote of administration	
Oral	170 (91.9%)
Intravenous	15 (8.1%)

Majority of patients were prescribed PPIs once daily 151 (81.6%) in comparison to 32 (17.3%) of patients who were prescribed it twice daily. Only 2 (1.1%) of the study patients were prescribed PPIs more than twice daily. The route of acid suppressive drug administration was orally for 170 (91.9 %) of patients, while the intravenous route was used in only 15 (8.1%) of the study patients. The intravenous PPIs used in all patient was omeprazole 40 mg given once daily early in morning [Table 1].

The largest percentage of acid suppressive drug prescribing for the study patients was 169 (91.4%) patients at discharge. The remaining prescribing percentage was during hospitalization 16 (8.6%) for study patents. The majority of patients included in our study were prescribed acid suppressive drugs as a co-prescribed drug 125 (67.6%), the rest of patients were prescribed acid suppressive drugs for direct reason to treat different gastrointestinal diseases 60 (32.4%). The co-prescribed drugs such as non steroidal anti-inflammatory drugs (NSAIDs) (15.7%), aspirin (13.5%), antimicrobials (9.2%), steroids (5.4%), antacids (3.8%), oral iron (2.7%), alendronate (1.6%), vitamins (1.1%) and other (14.6 %). Our results showed that most of the patients who were prescribed acid suppressive drugs do not suffer from adverse effects (99.5%). Only 0.5% of patient complained from Headache [Table 2].

Table 2. Association between the time and reason of prescription Acid suppressive drugs and the study variables

Study variable Acid suppressive drugs (%)	Time of drug prescription
At discharge	169 (91.4%)
Hospitalization	16 (8.6%)
Reasons for prescription	
Direct	60 (32.4%)
Co-prescribed drug as:	125 (67.6%)
Aspirin	25 (13.5%)
NSAID	29 (15.7%)
Steroids	10 (5.4%)
Alendronate	3 (1.6%)
Antacid	7 (3.8%)
Iron (PO)	5 (2.7%)
Vitamin	2 (1.1%)
Antimicrobial	17 (9.2%)
Others	27 (14.6%)
Adverse effects	
Not have	184 (99.5%)
Headache	1 (0.5%)

DISCUSSION

Acid suppressive drugs (ASDs) either histamine 2 receptor antagonist or, proton pump inhibitors, are some of the most commonly used treatment of acid-related diseases and the prevention of gastric mucosal damage. The prescriptions of acid suppressive drugs are increasing rapidly in Saudi Arabia as well as worldwide and they have become one of the most commonly prescribed drugs [18].

The current study showed that (91.9 %) of patients who used acid suppressive drugs were detected in outpatient pharmacy and only (8.1 %) were detected in inpatient department of both Abha hospitals that were included in the study. This is in accordance with the previous studies by Ramirez E *et al* [20] and Sandozi T [21] who reported that the use of PPIs range from (28.65 %) to (82.65%) and (45 %) of hospitalized patients, respectively. The lower percentage of inpatient acid suppressive drug prescription observed in the present study might be explained by the easier data gathering from outpatient than from inpatient departments. Another explanation is the wakefulness of the clinical pharmacists who are working in the inpatient department making acid suppression drugs prescription limited at inpatient.

The majority (51.9%) of patients who were prescribed ASDs studied were aged above twenty years old. This was in agreement with Nousheen *et al* [18] study that has all of the 100 patients on proton pump inhibitors at the above twenty years old age. And in agreement with Mayet AY [15] study that showed that most patients who use the acid suppression drugs located at the ages between 41-59 years old. The proportion of elderly patients was higher in our study might be because usually they have serious comorbid illnesses that bring them to the hospital and require admission for longer periods. Furthermore, the study patients showed difference acid suppressive drugs prescription percentages between male and females, the use of PPIs was more in females (54.6%) in comparison to males (45.4%). This is in accordance with the previous study of Todd H. Baron *et al* [22] but in contradiction with the study of Mayet AY [15]. This was because most of the hospitals that we collected data from were maternity and pregnancy hospitals in which hormonal disorders may be the reason for the increase use of ASDs among females.

The H2 antagonists are mainly indicated therapeutically to promote healing of gastric and duodenal ulcers, treat uncomplicated gastro-esophageal reflux disease (GERD) and to prevent the occurrence of stress ulcers. [23] H2 antagonists are effective in mild to moderate cases of hyperacidity and are a cost saving prescription for the patients. If symptoms are not being controlled with an H2 antagonist then long-term PPIs can be initiated. Proton pump inhibitors are the drug of choice for severe acid reflux symptoms, esophagitis and strictures. They are used mostly to promote healing of gastric and duodenal ulcers and to treat GERD including erosive esophagitis which is either complicated or unresponsive to treatment with H2 receptor antagonists. They are also the mainstay in the treatment of pathological hyper-secretory conditions including Zollinger Ellison syndrome. [23] Our study showed that (31.9 %) of the patients were prescribed PPIs for gastritis, GERD and as a prophylactic use of NSAID induced gastritis, all of these indications were according to the criteria of rationality [18,23]. On the other hand, the other of the prescriptions of PPI (68.1 %) were unjustifiable. These results showed no difference in ASDs prescribing pattern from the previous studies that indicated that ASDs were misused in hospitals and in general practice. A study conducted for over one year in a single county hospital in the USA showed that only (22.5%) of all outpatient prescriptions of pantoprazole had a proper indication. [16] Another study in 2007 showed that (43%) of the prescriptions for ASDs were written without an appropriate indication [15]. Similarly, studies published in Europe and Ireland showed that 51% and 57% of their patients respectively, were given PPIs improperly. [17]. One explanation for the ASDs improper use is that practitioners may not know the correct indications for ASDs therapy, which may be the leading cause of the misuse of acid suppression.

Since the introduction of PPI in the late 1980s, their use has increased dramatically worldwide. [24-31] Proton pump inhibitor (PPIs) were the most commonly prescribed acid suppressive drugs for the patients (97.8%) included in the present study in comparison to the remaining (2.2%) of patient of our study who were prescribed histamine 2 antagonist drugs. This is comparable to what had been reported by Sandozi et al. where 73 % of clinicians chose a PPI as their first-line drug while 27% chose histamine 2 antagonist drugs. [21] But this does not conform with the study by F. Parente *et al* [19] who reported that ranitidine, as histamine 2 antagonist drugs, were the most frequently used drug (44.4%), followed by pantoprazole (31.8%) and omeprazole (23.0%). However, our results may be closer to the credibility given the cost and effectiveness of PPI compared to histamine 2 antagonist drugs. [21]

The frequency of administration of PPIs was once daily in (81.6%) of cases which was in line with the recommended dosage routine of PPIs as once daily but as shown in our study it can be given twice daily also for rapid action to achieve steady state rapidly as in (17.3%) of our study cases. These results were in accordance with similar studies in the past such as the study of Nousheen *et al* [18] were (97%) of the patients prescribed PPIs once daily. Furthermore, the oral route of administration of ASDs was the preferable route (91.9%) in both of Abha hospitals, the setting of our study. The interpretation of this high use of oral route could be that the biggest percentage of acid suppressive drug prescribed in this study was for patients at discharge (91.9%). In addition, this is likely because the mount of oral ASDs dosage is already calculated and did not need effort as in injection. Other reasons might be the pain of injection at the injection site and the ignorance of the people of the correct emplacement injection.

The frequency of prescribing ASDs in our study was found to be higher in patients with an existing risk factor and was mostly recommended by physicians as concomitant medications (67.6%). The most common concomitant medications used with PPIs were non steroidal anti inflammatory drugs (NSAIDS) (29.2%) in which aspirin composed (13.5%) of the NSAIDS prescribed, this is in accordance with the studies by Kumar A *et al* [32] and Raghavendra B *et al* [33] who have found high incidence of co prescription of PPIs with NSAIDs. The use of NSAIDs is an important predisposing factor for peptic ulcer disease in the community thus one of the important indications of PPIs is co-administration with NSAIDS to reduce the risk of gastrointestinal bleeding and

peptic ulcers. The second most prescribed drugs with PPIs were antimicrobials, (9.2%), this is a serious issue as (67.6 %) of the present study prescriptions of PPI were unjustified and it is a well-known fact that patients on proton pump inhibitors are also susceptible to colonization of pathogens which can lead to bacterial gastroenteritis and also there is higher risk of development of infection by *Clostridium difficile* (antibiotic associated diarrhoea). [18] The rest of patients were prescribed acid suppressive drugs for direct reason to treat different gastrointestinal diseases (32.4%). Because each drug has side effects, we detected the side effects of ASDs among the study patients but most of the patient did not suffer from any adverse effects (99.5%). Only (0.5%) of patient complained from headache as in the previous study of Nousheen et al [18] were headache was seen in only (5 %) of the patients. This is justified by the fact that PPIs generally are well tolerated [23].

CONCLUSION

Most patients in our study received ASDs improperly (67.6 %), indicating that Hospitals practice in Southern Region of Saudi Arabia, suffers from widespread improper use of ASDs. The results of this study highlight the need for a monitoring mechanism to periodically study prescription patterns of ASDs in order to further reduce its improper use. Individual Abha hospitals should develop their own strategies to overcome such misuse, notably for PPIs. Strategies that can be used include controlled policies like formulary restriction, PPI order sheets or stop-orders for specific indications. However, a study showed that the approach was associated with more rational prescribing of ASDs and was important in saving resources. Writing and implementing guidelines for the uses of ASDs, mainly PPIs, by pharmacists can be another strategy to reduce misuse.

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