

# Stress ulcer prophylaxis in the absence of guidelines: An exploratory study of different student perspectives from an Advanced Pharmacy Practice Experience (APPE)

LADONNA MARIE OELSCHLAEGER\*

Department of Pharmacy Practice, School of Pharmacy, Loma Linda University, Loma Linda, California 92350, USA.

## Abstract

**Background:** Guidelines for the use of stress-ulcer prophylaxis (SUP) do exist in the Intensive Care Unit (ICU) setting, but not in the non-ICU setting.

**Aims:** The objective was to analyse how fourth-year pharmacy students transfer knowledge acquired during didactic course work into clinical practice during an Advanced Pharmacy Practice Experience (APPE) in Adult Medicine, in the absence of such guidelines.

**Methods:** Three fourth-year pharmacy students completed an APPE in a non-ICU Adult Medicine setting. Part of this experience was hospital rounds with a medical team, which included a clinical pharmacist and a post-graduate year one (PGY1) pharmacy resident. The students reviewed the ASHP guidelines from 1999 and discussed the evidence-based recommendations in the ICU and non-ICU settings. During the rotation students completed journal club assignments about the challenges associated with SUP outside the ICU. At the end of the rotation, each student developed and documented their opinion on the use of SUP in the non-ICU setting.

**Results:** The opinions provided by the students ranged from opposing SUP in the non-ICU setting, over using clinical judgment for each patient, to overall uncertainty.

**Conclusion:** The opinions formed by the students varied, even though they participated in the same didactic coursework and APPE. Further studies could help determine the impact of didactic education and APPEs in the absence of clinical guidelines on pharmacy students.

**Keywords:** *stress-ulcer prophylaxis (SUP), Advanced Pharmacy Practice Experience (APPE), student perspective, Evidence-Based Practice (EBP), clinical guidelines*

## Introduction

“Stress ulcers are superficial lesions commonly (but not exclusively) involving the mucosal layer of the stomach that appear after major stressful events such as surgery and trauma” (Anderberg & Sjodahl, 1985; ASHP Commission, 1999). The rationale for the use of stress ulcer prophylaxis (SUP) is that stress ulcers in combination with identifiable risk factors can lead to upper gastrointestinal (GI) bleeding. This is well documented in Intensive Care Unit (ICU) settings (Ali & Harty, 2009). GI bleeding in ICU patients has been associated with high mortality. One study revealed that once a patient has experienced an upper GI bleeding, the mortality rate in these patients can range from 50-77% (Spirt & Stanley, 2006).

Pharmacy students learn to apply evidence-based practice (EBP) to answer therapeutic questions during formal years of didactic instruction and clinical rotation experiences. In 1999, the American Society of Health-System Pharmacists (ASHP) released the only guidelines

on SUP (1999). These guidelines recommend pharmacological therapy in ICU settings, but not in non-ICU settings due to the lack of evidence of clinically important bleeding upon extubation or ICU discharge after discontinuation of prophylaxis (Mohebbi & Hesch, 2009). According to these guidelines, there are two clinically independent risk factors associated with stress ulcers: respiratory failure (mechanical ventilation >48 hrs) and coagulopathy (platelet count <50,000 mm<sup>3</sup>, International Normalized Ratio >1.5 or Partial Thromboplastin Time >2x control value). Other risk factors include spinal cord injuries, multiple trauma, hepatic failure, thermal injuries, history of gastric ulceration or bleeding during the year before admission, sepsis, shock, corticosteroid therapy, intensive care unit stay >1 week, and occult or overt bleeding. ASHP recommends initiating SUP if at least one independent risk factor or at least two of the other risk factors are present in the ICU setting (ASHP Commission, 1999).

\*Correspondence: Prof. LaDonna Marie Oelschlaeger, Department of Pharmacy Practice, School of Pharmacy, Loma Linda University, Loma Linda, California 92350, USA. Tel: +1 909 558 7530. Email: LOelschlaeger@llu.edu

## Methods

### *Pharmacy Student Didactic Training*

The guidelines for use of SUP in ICU settings were introduced during didactic lectures in the GI Therapeutics Course, approximately one year prior to the start of Advanced Pharmacy Practice Experiences (APPEs). It was also emphasised that there are no set guidelines for the use of SUP in non-ICU settings. In addition, students learned that little is known or studied about the appropriate use of SUP in the non-ICU setting. The outcome of student learning as evidenced by written assessment was that students' knowledge was consistent with current guidelines, which recommend the use of SUP only in ICU settings. It is important to note that, whether there are clinical guidelines or not, students are highly encouraged to focus on patient-centred care using critical thinking skills and clinical judgment.

### *Advanced Pharmacy Practice Experience (APPE)*

Advanced Pharmacy Practice Experiences (APPEs) allow students to actively participate in patient care in various settings under the supervision of a pharmacist. It is expected that during this experiential training they will recall or review information that they have learned previously during their didactic course work. Three fourth-year pharmacy students completed their APPE in Internal Medicine, where they were actively involved in hospital rounds with the Adult Medicine Team in a non-ICU setting. In addition to these students, the Pharmacy Section of the Adult Medicine Team consisted of a clinical pharmacist, who served as their primary preceptor, and one Post-Graduate Year One (PGY1) pharmacy resident. During pre-rounding preparations, students reviewed electronic medical records of selected patients and generated non-pharmacological and pharmacological suggestions, including the use of acid suppressive therapy (AST) for SUP, such as; histamine-2-receptor antagonists and proton pump inhibitors (PPIs). This non-ICU clinical site did not have formal institution-specific criteria for the use of SUP.

In preparation for clinical rounds, the pharmacy students completed a literature review on the use of SUP in non-ICU settings. The students reviewed the ASHP guidelines from 1999 and discussed the evidenced-based recommendations in the ICU and non-ICU settings. In the course of the rotation students learned through journal club assignments about the challenges associated with SUP outside the ICU setting, which include variations in prescribing practices, clinical settings, physician preferences, and cost. While SUP in non-ICU settings could potentially be beneficial for some patients, there are considerable costs from the inappropriate use of SUP. In one study, it was estimated that the use of SUP in medicine patients exceeded \$110,000 for one year (Heidelbaugh & Inadomi, 2006). Also, long-term use of PPIs has been associated with an increased risk of infection and osteoporosis (Cunningham *et al.*, 2003, Dial *et al.*, 2004, Vakil, 2012).

## Results

After the six-week APPE, each of the three pharmacy students developed an opinion on the use of SUP in the non-ICU setting and their perspectives are cited below. The Institutional Review Board has determined that this activity does not meet the definition of human subjects research.

### *Student A:*

*“During my brief experience with the internal medicine team, I found that a majority of patients were not prescribed SUP on the medicine floor. Most patients were not on acid-suppressive therapy (AST) at all, and if they were, it was nearly always for an actual indication such as gastroesophageal reflux disease (GERD) or gastrointestinal (GI) bleeding. This was quite different from what I expected – literature reviews suggested the prevalence of non-ICU SUP would be much higher (Khalili et al., 2010, Hussain et al., 2010). However, our limited time and the disparity in individual attending physician preferences from week to week regarding the use of AST may have affected this. I reviewed a 2006 study investigating the incidence of bleeding and mortality for patients on SUP outside the ICU which found that not only is GI bleeding and subsequent mortality uncommon in these patients, but SUP did not prevent bleeding events (Qadeer et al., 2006). In general, I believe that if a patient does not need a medication, they should not be receiving it. Even if we extend the criteria for risk of GI bleeding in the ICU to the non-ICU setting, it appears most patients on the medicine floor do not even present with the two most significant risk factors for GI bleeding and therefore would not be candidates for SUP. This finding was supported by another study I reviewed, which investigated the efficacy of an internal institution guideline for non-ICU SUP, which found that although the use of AST for SUP decreased, the rate of inappropriate use did not (Dial et al., 2004). Ultimately, in light of my experience, the results of the aforementioned studies, the possible increase in side effects and costs, and the overall lack of clarity over this issue, I feel it is better to avoid SUP altogether outside of the ICU until more evidence becomes available.”*

### *Student B:*

*“As a student you spend hours sitting in lecture and at your desk trying to memorise countless numbers of algorithms of when to treat and how to treat. I never thought beyond what I learned in the classroom setting. As long as I had guidelines and followed them, I felt I would be a great pharmacist. But what do you do when there are no guidelines? This was unexplored territory for me. In the world of clinical practice, nicely organised charts often do not guide you and we are forced to use clinical judgment. We must weigh the*

*options-risk versus benefit, adverse reactions, and cost of treatment. Many physicians prescribe SUP out of fear that a patient may develop a GI bleeding during their hospital stay and to avoid legal repercussions (Hussain et al., 2010). Even though it can be equally troubling for us to have to make a decision without guidelines, I believe we can use our knowledge of medications to educate in areas like this, so we can treat each patient individually and lead to the best positive outcome for that specific patient.*

*Although we must look at every patient individually, when it comes to SUP, I believe that the risk of developing a stress ulcer outweighs the risk of developing an adverse reaction. Since the risk of mortality in a patient is up to 77% after developing a GI bleeding, I believe having them on a short course of SUP during their hospital stay would be of less physical and financial burden than if a patient were to be admitted due to their deteriorating condition after experiencing a bleeding. The studies regarding adverse effects due to SUP therapy have not been well established. In addition, there is preliminary discussion that the rate of mortality and development of stress ulcers is trending downwards leading to the suspicion that the use of SUP in non-ICU patients can be somewhat beneficial. I do not believe the lack of established guidelines automatically prohibits us from using SUP in non-ICU patients. Until we have a clearly defined reason which supports or refutes the use SUP in non-ICU patients, I believe we should evaluate each patient on an individual basis, looking at the severity of their illness, and use clinical judgment.”*

#### **Student C:**

*“Since there are no guidelines for SUP in the non-ICU setting, it is unclear when to use SUP outside of the ICU. During the medicine rotation, we were a part of a medical team that was comprised of an attending physician, a resident, two intern physicians, medical students, a pharmacist, a pharmacy resident, and three fourth-year pharmacy students. Different attending physicians rotated with the medical team. Each attending physician had a different opinion on the use of SUP in the medicine ward. The criteria for SUP for the patients varied with each of the attending physicians. I was uncertain when to use SUP outside of the ICU. An uncertainty and variability in the practice for SUP in the non-ICU setting will remain until guidelines are created for SUP outside of the ICU.”*

In summary, the opinions formed by the three students over the APPE are quite different, ranging from opposing SUP outside the ICU setting until more evidence is available, over using clinical judgment for each individual patient, to uncertainty.

#### **Discussion**

Guiding the development of pharmacy students in the area of clinical practice with or without guidelines is an essential aspect of pharmacy education. The results of this study demonstrate the different opinions formed by three pharmacy students who were placed in the same learning environment, participated in identical didactic coursework, but found it challenging to make therapeutic suggestions without any guidelines to follow. This result was not expected.

A clinical pharmacist precepting pharmacy students serves as a role model for pharmacy education and practice. Through APPEs, students are often provided with opportunities to apply didactic knowledge, enhance critical thinking skills, and acquire clinical practice skills. Students often witness clinicians making recommendations in various environments, but focus more on challenges related to the clinical setting than on the patient. This study highlights that one such challenge is the absence of clinical guidelines. Using a patient-centred approach and critical thinking skills are necessary to provide optimal individualised care. When the absence of guidelines becomes the focus, it could supersede the wellbeing of the patient, which should be the goal of clinical practice. In an environment where EBP and patient-centred care are highly encouraged, pharmacy students’ development and training may benefit from tailoring the clinical experience to focus more on the critical thinking skills. Learning from healthcare professionals that serve as role models is an essential component of the APPE. However, an important goal is to enable the student to develop suggestions on their own that they are confident with and that likely benefit the patient.

One possible way to reach a situation where students can make valid suggestions with confidence would be to wait until sufficient evidence and guidelines for the use of SUP in the non-ICU setting become available. Alternatively, APPEs may benefit from providing more activities that nurture life-long learning based on critical thinking and clinical judgment to aid students in achieving valid suggestions even in the absence of specific guidelines. The latter approach may eventually be more beneficial to health care, as situations where no guidelines are available occur in a multitude of settings. This becomes even more relevant as there is a push to extend the responsibilities of pharmacists in conjunction with the implementation of the Affordable Care Act.

#### **Conclusion**

Further studies in the area of teaching and learning could help determine the impact of didactic education and APPEs in the absence of clinical guidelines on pharmacy students. Maybe even more importantly, pharmacy education has an obligation to train life-long learners who develop critical thinking skills that they can apply effectively to improve patient care, even if there are no specific guidelines to follow.

**References**

- Ali, T. & Harty, R.F. (2009). Stress-induced ulcer bleeding in critically ill patients. *Gastroenterology Clinics of North America*, **38**, 245-65.
- Anderberg, B. & Sjobahl, R. (1985). Prophylaxis and management of stress ulcers. *Scandinavian Journal of Gastroenterology Supplement*, **110**, 101-4.
- ASHP Commission (1999). ASHP Therapeutic Guidelines on Stress Ulcer Prophylaxis. ASHP Commission on Therapeutics and approved by the ASHP Board of Directors on November 14, 1998. *American Journal of Health-System Pharmacy*, **56**, 347-79.
- Cunningham, R., Dale, B., Undy, B. & Gaunt, N. (2003). Proton pump inhibitors as a risk factor for *Clostridium difficile* diarrhoea. *Journal of Hospital Infection*, **54**, 243-5.
- Dial, S., Alrasadi, K., Manoukian, C., Huang, A. & Menzies, D. (2004). Risk of *Clostridium difficile* diarrhea among hospital inpatients prescribed proton pump inhibitors: cohort and case-control studies. *Canadian Medical Association Journal*, **171**, 33-8.
- Heidelbaugh, J.J. & Inadomi, J.M. (2006). Magnitude and economic impact of inappropriate use of stress ulcer prophylaxis in non-ICU hospitalized patients. *American Journal of Gastroenterology*, **101**, 2200-5.
- Hussain, S., Stefan, M., Visintainer, P. & Rothberg, M. (2010). Why do physicians prescribe stress ulcer prophylaxis to general medicine patients? *Southern Medical Journal*, **103**, 1103-10.
- Khalili, H., Dashti-Khavidaki, S., Hossein Talasaz, A.H., Tabeefer, H. & Hendoiee, N. (2010). Descriptive analysis of a clinical pharmacy intervention to improve the appropriate use of stress ulcer prophylaxis in a hospital infectious disease ward. *Journal of Managed Care Pharmacy*, **16**, 114-21.
- Mohebbi, L. & Hesch, K. (2009). Stress ulcer prophylaxis in the intensive care unit. *Proceedings (Baylor University Medical Centre)*, **22**, 373-6.
- Qadeer, M.A., Richter, J.E. & Brotman, D.J. (2006). Hospital-acquired gastrointestinal bleeding outside the critical care unit: risk factors, role of acid suppression, and endoscopy findings. *Journal of Hospital Medicine*, **1**, 13-20.
- Spirit, M.J. & Stanley, S. (2006). Update on stress ulcer prophylaxis in critically ill patients. *Critical Care Nurse*, **26**, 18-20, 22-8; quiz 29.
- Vakil, N. (2012). Prescribing proton pump inhibitors: is it time to pause and rethink? *Drugs*, **72**, 437-45.