NYS-ACCP Insider

St. John's University College of Pharmacy and Health Sciences

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In this Issue:

SJU-ACCP Student Chapter Highlights

As an ACCP student chapter with Vincentian values at St. John's University, we commit ourselves to the value of service to our community while orienting our students to the practice of clinical pharmacy. Our goal is to provide information regarding career opportunities, to promote excellence in patient care, research and education, and to develop the skills necessary to work on a multidisciplinary team. Take a look at our events that shaped our amazing 2018 year!

Annual Alumni Dinner

This keynote event invites our alumni back to speak about their experiences and diverse career paths, giving our members the chance to explore a variety of post-graduation opportunities. We invited a total of eight SCCP alumni who played a crucial role in our student chapter:

Dr. James Schurr - Pharmacist and MD Candidate at Stony Brook University
Dr. Stephen Argiro - Medication Therapy Management Pharmacist at Mount Sinai Beth Israel
Dr. Jennifer Miao - Informatics Pharmacist at Memorial Sloan Kettering Cancer Center
Dr. Caitlyn Cummings - Pharmacist in Transitions of Care at Long Island Jewish Medical Center
Dr. Jack Bao - PGY1 Pharmacy Resident at NYU Langone Health
Dr. Victoria Hom - PGY1 Pharmacy Resident at Healthfirst
Dr. Gina Daniel - PGY1 Pharmacy Resident at Huntington Hospital
Dr. Oliwia Niewiadomska - PGY1 Pharmacy Resident at Huntington Hospital

We would like to thank our alumni for their past involvement in shaping our organization and for continuously giving us advice after graduating.

Sim Man Collaboration with Physician Assistant Students

Sim Man is a semiannual interprofessional experience held in collaboration between the Pharm.D. program and the physician assistant (PA) program. During this event, pharmacy students work alongside PA students to solve a case using a human patient simulation mannequin. This year, students evaluated a patient with type 2 diabetes who was hospitalized due to a hypoglycemic event. The PA students diagnosed the patient and ordered the appropriate labs while pharmacy students counseled the patient on the proper use of insulin and diabetes medication. Pharmacy professors, Dr.Sharon See, Dr.Bill Maidhof and PA professor Pam Fernandez also worked alongside the students, providing thorough counseling points and clinical pearls to the participants.

Clinical Pearl Series

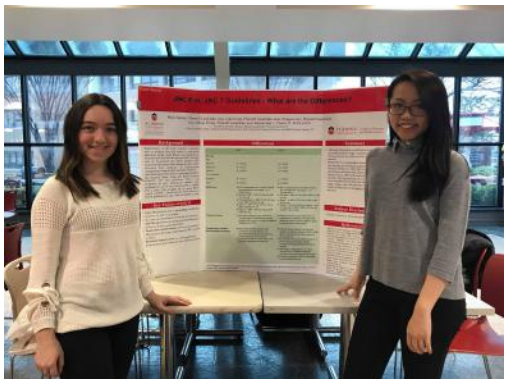
Every month, SJU SCCP invites a 6th year PharmD student who is completing their APPE rotations to share a clinical pearl with the student chapter. Guest speakers included:

Maria Spilios who presented on Staphylococcal Scalded Skin Syndrome
Shireen Farzadeh who presented on Direct Oral Anticoagulants and Reversal Agents
Raymond Gan who presented on Giant Cell Arteritis
Jack Bao who presented on Cracking the Bacterial Code

These topics were only briefly touched upon in class, so these short lectures were great opportunities for students to gain more clinical knowledge outside the scope of their lectures.

Mock Competency Exam

St. John's University College of Pharmacy and Health Sciences administers a Competency Exam to all P3 students to evaluate whether or not students are ready to provide an appropriate level of care during their APPE rotations. The College of Pharmacy provided a brief orientation, but our student chapter recognized the anxiousness among students and the need for a structured simulation of the exam. Our 6th year PharmD students designed a case study that followed the same structure as our school-administered Competency Exam and provided tips to help students study for and navigate the exam the following week. Students were also given the opportunity for a one-on-one counseling session to explain their findings in the case study. The event was held in January 2019 and involved over 100 student participants! We would like to thank all of our 6th year PharmD volunteers who helped spearhead the program.



Peer Mentoring Showcase

Our Annual Peer Mentoring Showcase is a culmination of a year's worth of work by our peer mentoring groups. Groups were paired according to their interests at the beginning of the year and were encouraged to pick a topic to research and conduct a poster or PowerPoint presentation at the end of the year. Topics included, but were not limited to, new hypertension guidelines, effects of statin use in geriatrics, and antibiotic resistance. We invited all members and groups to come together for our annual night of research and present these projects to fellow students and faculty. This showcase exhibits the innovative mindset of our members and allows them to present new, growing trends in the world of pharmacy.

Volunteering at GallopNYC

GallopNYC is a local organization that utilizes therapeutic horsemanship to help both children and adults with disabilities and special needs build developmental, emotional, social, and physical skills. As volunteers, we are responsible for assisting the guides who lead the horses while spending time with the children and adults who are riding them. Although the time we spend with each person is is brief, there is a lasting satisfaction from acting as energizers and cheering for the riders. GallopNYC is a heartwarming experience to take part in, and it is a beautiful sight to see a strong community working together for the well-being of those with disabilities and special needs.

Research Rounds Collaboration with IPhO

Research Rounds is a two-part program held in collaboration with IPhO (Industry Pharmacists Organization) and features Associate Clinical Professor Dr. Laura Gianni who introduced students to research and journal clubs. The first part of the program involved Dr. Gianni presenting a foundational session on best research practices, including evidence-based medicine. The second part was focused on Dr. Gianni showing students how to apply the information learned in the foundational session by teaching us how to analyze and read through a clinical research article in its entirety. From Research Rounds, students gain the skills necessary to break down the components of a research article and understand the latest, relevant evidence-based information.

- Chieh (Jennifer) Chen, PharmD Candidate 2020
- Jeffrey Thomas, PharmD Candidate 2020
-Ashley Leung, PharmD Candidate 2021

Meet our NYS – ACCP Officers

President: **Amanda RM Winans, PharmD, BCPS, CACP**

Amanda McFee Winans earned her PharmD in 2007, graduating from Albany College of Pharmacy. She completed a postgraduate Pharmacy Practice Residency with an emphasis in Pain and Palliative Care at Bassett Medical Center in Cooperstown, New York. Dr. Winans currently serves as the primary pharmacist clinician of the outreach Anticoagulation Management Service at Bassett Healthcare, caring for cardiology and cancer patients alike. She continues to support the pain and palliative care practice at Bassett Medical Center through the Pain Management Committee and related quality improvement initiatives. Dr. Winans holds adjunct faculty appointments with multiple Colleges of Pharmacy and holds Clinical Faculty appointment in Pharmacology at Columbia University College of Physicians and Surgeons. She has authored and contributed to numerous peer-reviewed manuscripts related to anticoagulation, and pain and symptom management

President-Elect Amanda Engle, PharmD, BCPS

Dr. Amanda Engle received a Bachelor of Science in Biochemistry from Syracuse University followed by a Doctor of Pharmacy degree from the University of Maryland, Baltimore with concurrent completion of the Johns Hopkins Clinical Pharmacy Practice Development Program. She then completed residency training at St. Peter's Hospital in Albany, New York and achieved Board Certification as a Pharmacotherapy Specialist. Dr. Engle practiced as a Clinical Pharmacy Specialist at Bassett Medical Center in Cooperstown, New York where she specialized in Pain and Palliative Care. While there, Dr. Engle helped lead the development of numerous quality improvement and research initiatives including several aimed at reducing risk with opioid use. Dr. Engle is currently an Assistant Professor at Albany College of Pharmacy and Health Sciences with a shared role at Albany Medical College to develop interprofessional education opportunities between pharmacy and medical students. There she teaches internal medicine and interprofessional education experientially, and pain management and various internal medicine topics didactically. Her research interests continue to include opioid use risk reduction as well as educational and patient outcomes of interprofessional student teams. Dr. Engle enjoys spending time with family and friends cooking, hiking, playing board games, and hanging out with her 9 month old bernese mountain dog-poodle mix (Bernedoodle) puppy.

Past- President: William Eggleston, PharmD, DABAT

William (Willie) Eggleston is a Clinical Assistant Professor at the Binghamton University School of Pharmacy and Pharmaceutical Sciences and a Clinical Toxicologist at the Upstate New York Poison Center in Syracuse, New York. He earned his PharmD from the Wilkes University Nesbitt College of Pharmacy and completed a two-year fellowship in Clinical Toxicology and Emergency Medicine at SUNY Upstate Medical University and the Upstate New York Poison Center. His research interests include opioid use disorder prevention, treatment, and harm reduction. He is an avid triathlete, perpetual optimist, and connoisseur of fine chocolate milks.

Secretary/Treasurer: Bennett Doughty, PharmD, BCPS, BCPP

Bennett Doughty is a Clinical Assistant Professor at the Binghamton University School of Pharmacy and Pharmaceutical Sciences as well as a Clinical Psychiatric Pharmacy Specialist at the Robert Packer Hospital in Sayre, PA. Bennett earned his PharmD from the University of Connecticut in 2016 and completed two years of residency at the VA Connecticut Healthcare System in West Haven, CT, specializing in psychiatry. His current research interests include patient engagement in substance use treatments and interprofessional education. In his spare time, Bennett enjoys running, hiking, skiing, playing piano, and re-watching episodes of "The Office."

Clinical Spotlight: Gregory J. Hughes, PharmD, BCPS, BCGP

Dr. Gregory J. Hughes, PharmD, BCPS, BCGP is an Associate Clinical Professor in the Department of Clinical Health Professions at St. John's University College of Pharmacy and Health Sciences. Dr. Hughes completed a PGY1 residency at the St. Louis VA Medical Center and currently serves as a Clinical Pharmacy Preceptor in the Department of General Internal Medicine at North Shore University Hospital where he provides his pharmacotherapy expertise.

1. What are your current responsibilities at your job at the North Shore University Hospital?

   I am an Associate Clinical Professor in the Clinical Health Profession Department at St. John's College of Pharmacy and Health Sciences. I also have an official appointment as an Assistant Professor in the Department of Medicine at the Donald and Barbara Zucker School of Medicine at Hofstra/Northwell. My role at Northwell in Manhasset is teaching as a preceptor with Advanced Pharmacy Practice Experience (APPE) students in the inpatient rotation. What that means is that I work as a preceptor for APPE students, as well as PGY1 and PGY2 residents, to provide inpatient internal medicine service, which is led by the hospitalist physicians. My role is to manage the pharmacotherapy decisions that relate to treating and preventing diseases in patients, while precepting students and residents and providing education to the rest of the medical staff, nursing staff and patients on the floor.

2. What was your favorite part of your job, in terms of teaching and practicing in the hospital?

   The thing I like about my position as a teacher in the classroom and in the hospital is the interplay between the two settings. I think the interplay between the two helps improve myself as a clinician. What I learn within the hospital, which includes my interactions with both my patients and providers, I then can use to make my class better by making better clinical practice cases. What I learn in class, which I do to stay up-to-date on new drugs and concepts in pharmacy, I can take back to the hospital. Because I know the studies better from preparing for my classes, I can apply this knowledge to optimize patient care.

3. What is one challenge you have faced in your career as a pharmacist and how have you been able to overcome that challenge?

   One aspect of my career that I find challenging is the emotional burden of taking care of patients and seeing them deteriorate from a variety of complex diseases. Some advice I can offer for future pharmacists is maintaining other aspects of life, such as exercising, eating properly, sleeping well and having hobbies besides pharmacy to keep a perspective on life. It is also important to maintain relationships outside pharmacy and health-system medicine in general.

4. What advice can you give to students pursuing a clinical pharmacy career or a teaching career?

   In order to become a clinical pharmacist or an academic pharmacist, a residency is often required. It is important to select rotations that expose you to a wide variety of areas, because you may not know what peaks your interests this early in your career. You should try to seize different opportunities when they are presented to you, whether it is from pharmacy organizations on campus, off campus, or helping out in the community. You never know what you will be exposed to or who you may meet, because any of those experiences can be brought up in a potential interview in the future for jobs or residencies or fellowships.

-Chirag Gosalia, PharmD Candidate 2020
-Ada Zheng, PharmD Candidate 2021
-Vienica Funtanilla, PharmD Candidate 2021

Pushing for More Pharmacist Power: Hormonal Contraceptive Prescribing

Pharmacists serve an integral, yet underutilized, role in providing accessible patient care, improving patient adherence and outcomes, and decreasing physician burden. Despite the decline in unintended pregnancy rates, barriers, such as lack of accessibility to and the high cost of physician visits, likely contribute to nearly 50% of unintended pregnancies in the United States each year.[1] In efforts to improve access to oral contraceptives, pharmacists have been fighting for the ability to prescribe oral contraceptives without a collaborative practice agreement (CPA).[2]

In New York, pharmacists are currently only permitted to dispense contraceptives for patients with a prescription from their provider. In the last four years, however, several states including California, Colorado, Hawaii, Maryland, New Mexico, and Oregon, have granted pharmacists the ability to prescribe various dosage forms of hormonal contraceptives.[2] However, there is a catch. In order to select the most appropriate contraceptive, pharmacists require patients to complete questionnaires with basic screening information, such as blood pressure, smoking history, pregnancy status, and medication history. Requirements vary among states, as the authority to prescribe is a state-specific bill. For instance, Colorado requires a questionnaire and an algorithm to determine the hormonal contraceptive eligibility in patients 18 years and older.[3] In Oregon, pharmacists must complete an additional five hours of training in order to be certified to prescribe. In all six states, pharmacists are required to recommend regular clinic visits to patients, document their encounters, and provide patients with educational materials.[4,5]

Recent studies have demonstrated the success of this new implementation. In a community-based intervention study, 91% of the women enrolled were prescribed hormonal contraceptives and 70% reported continuous usage. Almost all respondents reported were willing to continue this service.[6] Similarly, pharmacists in Oregon experienced positive outcomes 12 months after the start of prescribing. Not only did their motivations to prescribe remain the same, but the average time for each patient also took no longer than 30 minutes. Through prescribing hormonal contraceptives, pharmacists increase access for patients in need, reduce the risk of unintended pregnancy, and expand the scope of practice. It is in the hopes that more states can benefit from this legislation in the future.[7]

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-Shireen Farzadeh, PharmD Candidate 2019
-Jingzhi Yang, PharmD Candidate 2021

COPD Updated Guidelines

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) works to improve prevention and treatment of chronic obstructive pulmonary disease (COPD) by creating guidelines, which are used by healthcare professionals around the world, for the management of the disease state. The last time a complete revision was done on these guidelines was in 2011. Since then, several changes have been made. The GOLD 2019 report includes multiple studies that were conducted on patients with low exacerbation rates and their treatment effectiveness with long-acting beta-agonists/long-acting muscarinic antagonists (LABA/LAMA). A parallel-group study funded by Novartis found that combination therapy with LABAs and LAMAs are more effective than monotherapy with LAMA alone in patients with severe to very-severe COPD.[1] However, a 52-week, a double-blind, randomized, parallel-group, active-controlled trial funded by Boehringer Ingelheim International GmbH found that combining a LABA and LAMA did not have a significant difference compared to administration of a LAMA alone.[2] In a 52-week, randomized, double-blind, double-dummy, noninferiority trial funded by Novartis, it was found that in patients with a history of exacerbations, the use of combination therapy with LABA/LAMA is preferred over inhaled corticosteroids (ICS)/LABA combination therapies.[3] However, in a randomized trial funded by GlaxoSmithKline patient populations with a high risk of exacerbations, ICS/LABA combinations are more effective than LABA/LAMA combinations.[4] The results from these conflicting clinical trials are based on group mean data, where patient-reported outcomes suggest that combination bronchodilators are preferred overall.[5] However, it is best to evaluate an individual patient's symptom responses to the combination and then determine their future course of therapy.[5]

The treatment of exacerbations is the other main focus for the management of the disease. Any patient with COPD needs to be prepared for an exacerbation since it is bound to arise at some point. Therefore, the relevance of exacerbation treatments is quite high and warranted the conduction of studies. This resulted in several updates that were published in the 2019 GOLD report. Specifically, the newest GOLD update now accepts the use of only nebulized budesonide as an alternative treatment for exacerbations because it was found to be therapeutically comparable treatment to the first-line treatment, intravenous methylprednisolone.[5] The reduction of exacerbations was found in patients that were treated with an intense combination of ICS/LABA for ten days at the onset of an upper respiratory tract infection. This decrease was especially seen with patients with severe COPD.[5] Aside from all the new additions to the options of therapy, a randomized, double-blind, placebo-controlled trial that was funded by the Netherlands Organization for Health Research and Development showed that adding doxycycline to oral corticosteroid did not increase the time between exacerbations and therefore is no longer an appropriate therapy.[6]

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-Holly Sokol, PharmD Candidate 2020
-Rachel Reis, PharmD Candidate 2021

Three New Migraine Drugs

On May 17, 2018, the U.S. Food and Drug Administration (FDA) approved erenumab (Aimovig™) for prophylactic migraine treatment in adults. Erenumab works by blocking the activity of calcitonin gene-related peptide (CGRP), making it the first drug in the class of CGRP receptor antagonists. The next two drugs in this class, fremanezumab (Ajovy™) and galcanezumab (Emgality™), were approved on September 14th and 27th 2018, respectively.[1]

It is hypothesized that an increased amount of CGRP is linked to the formation of migraines due to vasodilation of the blood vessels in the dura and pia mater. This vasodilation leads to nociception that emanates from the trigeminal nerve nucleus in the brain.[2]

The CGRP receptor antagonists are monoclonal antibodies of the CGRP receptor that antagonize by binding to a receptor-specific epitope. This eventually promotes downregulation of the receptor, which will halt blood vessel vasodilation and mitigate migraines.[3]

Erenumab, produced by Amgen, is dosed at 70mg/month but can increase to 140mg/month. Fremanezumab, produced by Teva, is dosed at 225mg/ month; an alternative dose is 675mg (three injections) every three months. Galcanezumab, produced by Lilly, is first dosed at a 240mg, and then at 120mg/month.[4]

This novel class of medication is given as a monthly subcutaneous injection. The most common side effects associated with CGRP receptor antagonists are injection site reactions. Constipation is associated with erenumab. Hypersensitivity reactions have been reported within hours and up to one month after the admission of fremanezumab and galcanezumab; in these situations, discontinuation and/or treatment with corticosteroids were required. There is also a theoretical concern with cardiac side effects due to the vasodilating nature of CGRP, but studies have not shown major adverse cardiovascular effects to date. However, patients with significant cardiovascular risk factors were mostly excluded from studies.[5]

The CGRP receptor antagonists can be combined with oral agents and are considered for patients who have adherence issues, side effects, poor response, or drug interaction concerns with oral agents for migraines. This novel class of drugs can be a solution for patients who suffer from migraines for whom previous treatments have not worked.

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-Kathleen Horan, PharmD Candidate 2020
-Michael Knapp, PharmD Candidate 2020

Sufentanil (Dsuvia™) New Drug Approval

On November 2, 2018, the Food and Drug Administration (FDA) approved sufentanil (Dsuvia™), the most potent opioid on the market. The approval was controversial in the pharmaceutical industry due to the current opioid crisis in the United States.

Sufentanil is a single dose, sublingual tablet that contains 30 micrograms of sufentanil citrate, an opioid analgesic derived from fentanyl (Duragesic™). It is administered through a disposable single dose applicator and can only be administered by a healthcare provider in certified and medically supervised healthcare settings including hospitals, surgical centers, and emergency departments. The recommended dosing is 30 micrograms sublingually as needed with a minimum of one hour between doses. In addition, sufentanil is a Schedule II Controlled Substance (CII) with a maximum daily dose of 12 tablets in 24 hours. Sufentanil should not be used at home, by children or for more than 72 hours. Furthermore, sufentanil is an opioid agonist that binds to the μ-opioid receptors in the central nervous system (CNS), providing therapeutic actions of analgesia and sedation.[1]

Along with its approval comes many concerns due to the negative stigma of the opioid epidemic. In order to thwart abuse and dangerous adverse effects, such as life-threatening respiratory depression and death due to overuse, accidental exposure, and ingestion, the FDA has established a Risk Evaluation and Mitigation Strategy (REMS) program. The REMS program tightly controls distribution and use of sufentanil.[2] As with most opioid drugs addiction, abuse and misuse are major concerns. It is also important that sufentanil is not discontinued abruptly, but instead, the patient should be tapered off gradually prior to discharge or transfer from the certified and medically supervised healthcare setting.[1] Practitioners should be cautious when using sufentanil with CYP3A4 inducers and inhibitors. Discontinuation of CYP3A4 inducers and concomitant use with CYP3A4 inhibitors may result in an increased sufentanil concentration, leading to an overdose. Concomitant use with benzodiazepines and other CNS depressants, including alcohol, can lead to profound sedation, respiratory depression, coma, and death.[1]

Contraindications for use include significant respiratory depression, acute or severe bronchial asthma in an unmonitored setting or in the absence of resuscitative equipment, known or suspected GI obstruction, including paralytic ileus and known hypersensitivity to sufentanil or components of Dsuvia.[1]

All in all, time will tell how beneficial sufentanil's effects will be in patients given its strictly controlled use and access.

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-Ravena Rampersaud, PharmD Candidate 2020
-Valerie Zhao, PharmD Candidate 2021

What should pharmacists take away from the Aspirin in Reducing Events in the Elderly (ASPREE) Trial?

While low-dose aspirin has been a popular preventive agent in patients with cardiovascular diseases, the ASPREE trial, a randomized, double-blind, placebo-controlled, primary prevention trial that was recently published, has shown that low-dose aspirin use is not beneficial among healthy, elderly patients.

The primary objective of the ASPREE trial is to determine whether daily use of 100 mg of aspirin over an average of 4.5 years of treatment increases healthy lifespan, defined as survival free of dementia and disability, in a population of healthy participants aged 70 years or older, or 65 years or older if they were African American or Hispanic.[1]

Overall, the ASPREE trial has found that the benefits of daily low-dose aspirin therapy did not outweigh its risks in the healthy elderly patients. First, the difference between the two groups in regards to the primary endpoints, which included death, dementia, or physical disability, was not significant (21.5 events per 1000 person-years in the aspirin group and 21.2 events per 1000 person-years in the placebo group).[2] Second, the rate of cardiovascular disease was similar between the aspirin group and the placebo group (10.7 events per 1000 person-years of follow-up and 11.3 events per 1000 person-years, respectively).[3] Meanwhile, the risk of major hemorrhage was significantly higher with aspirin than with placebo (8.6 events per 1000 person-years in the aspirin group, as compared with 6.2 events per 1000 person-years in the placebo group).[3] Lastly, all-cause mortality was higher in the aspirin group than the placebo group with 1.6 excess deaths per 1000 person-years occurring in the aspirin group due to mainly cancer.[4]

However, the ASPREE trial has several limitations as well. White participants dominated 91% of the study, so the applicability of the main findings of the ASPREE trial to ethnic subgroups is unclear.[2] Second, the results of the ASPREE trial have not been replicated and should be interpreted with caution due to conflicting data from other primary prevention trials.[4,5] Third, only healthy individuals were included in the study, so the ASPREE trial results do not apply to those younger than 70 years old or those younger than 65 if they are African American or Hispanic, have a history of cardiovascular disease, dementia, or disability, or is currently taking aspirin for secondary prevention. Most importantly, patients should not stop taking daily aspirin without first consulting their physicians.

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-Wingsze (Angel) Liu, PharmD Candidate 2021

Andexxa® New Drug Update

Factor Xa inhibitors apixaban, edoxaban, and rivaroxaban, also known as direct oral anticoagulants (DOACs), are indicated for the treatment of DVT and pulmonary embolism as well as the reduction of risk of stroke and systemic embolism in nonvalvular atrial fibrillation. DOACs, when compared to warfarin, have significant clinical benefits in that they do not require routine monitoring of laboratory tests for efficacy, have limited food interactions, and have even fewer drug interactions. However, unlike warfarin and its antidote vitamin K, factor Xa inhibitors lack an antidote. Bleeding is the most common adverse reaction associated with anticoagulation, and without a remedy, hemorrhages can become life-threatening.

In May 2018, the Food and Drug Administration approved Portola Pharmaceutical's antidote for factor Xa inhibitors, Andexxa®. Andexxa® is a recombinant modified human factor Xa protein indicated for patients treated with rivaroxaban and apixaban when reversal of anticoagulation is required due to life-threatening or uncontrolled bleeding. Andexxa® had undergone approval via the FDA's accelerated approval pathway. Therefore, the continued approval for Andexxa®'s relies upon the results obtained through their post-marketing study.[1]

Andexxa®'s approval was determined by data obtained from two Phase II ANNEXA studies, which tested the safety and efficacy of the factor Xa antidote. The results found in this study showed that the mean percent change from baseline in anti-factor Xa activity at the nadir was 97% for the Andexxa® group when administered to patients taking rivaroxaban. The mean percent change (SD) from baseline in anti-FXa activity at the nadir was 92% for the Andexxa group when administered to patients taking apixaban.[2] The findings of these from this study indicated Andexxa® was capable of quickly and significantly reversing anti-Factor Xa activity.

In clinical trials, Andexxa® has been shown to induce adverse events such as arterial and venous thromboembolic events, ischemic events, cardiac events, and sudden death. These events were observed within 30 days of administration in 18% of patients. To reduce the likelihood of a thromboembolic event, resume an appropriate anticoagulant therapy as soon as possible.[2]

Andexxa® is available for $3,300.00 per 100 mg vial. The IV low dose is 400mg, whereas the high dose is 800mg. Dosing is determined by the strength of the last given Factor Xa inhibitor.[3]

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-Jeffrey Thomas, PharmD Candidate 2020
-Ahmed Abdelfatah, PharmD Candidate 2021
-Devesh Permanan, PharmD Candidate 2023

CHEST Updated Guidelines

The 2018 CHEST Antithrombotic Therapy for Atrial Fibrillation replaces the 2012 CHEST guideline by providing more tailored treatment recommendations that incorporate the use of CHA_2DS_2-VASc, novel oral anticoagulants (NOACs), and HAS-BLED scores.

One key difference between the two guidelines lies in the risk stratification using the $CHADS_2$ scores in the old guideline and the CHA_2DS_2-VASc scores in the updated guideline. CHA_2DS_2-VASc includes a broader range of risk factors and is used in the 2018 guideline to eliminate the "low-moderate-high risk" categorizations in the 2012 guideline.[1,2] The new guideline further separates CHA_2DS_2-VASc risk factors into sex or non-sex factors, and anticoagulation therapy is only warranted if the patient has a non-sex risk factor.[1]

Another difference concerns drug therapy with NOACs, which is preferred over vitamin K antagonists (VKAs) in both guidelines. However, only one NOAC, dabigatran, was included in the 2012 guideline, as it was the only drug approved before 2012 with an approval date of October 19, 2010, and an indication specifically for patients with atrial fibrillation.[3] The 2018 guideline recommends other NOACs in addition to dabigatran, such as apixaban, rivaroxaban, and edoxaban, as these drugs have recent FDA approved labeled indications for reducing the risk of cardiovascular events in patients with atrial fibrillation.[4,5,6] This gives practitioners more options to tailor their therapies to be patient-specific.

A third difference is an emphasis on screening for significant bleeding risks in the 2018 CHEST guideline. This factor was not stressed in the old guideline due to limited evidence validating the use of bleeding risk scores.[2] The 2018 guideline highlights multiple new studies which conclude that HAS-BLED holds the best predictive values in comparison with other bleeding risk scores, such as ORBIT, $HEMORR_2HAGES$, and ATRIA.[7] The 2018 guideline advises clinical practitioners that a high HAS-BLED score indicates the need for frequent follow-ups and close monitoring, but does not eliminate the use of oral anticoagulation therapy.[1] Unlike the 2012 guideline, the 2018 guideline also recommends that clinical practitioners consider modifiable bleeding risk factors before initiating anticoagulation therapy.[1]

Although many of these changes in medication therapy have already been applied to practice, the 2018 CHEST guideline provides a formal evidence-based recommendation that validates the use of the CHA_2DS_2-VASc scoring, new NOACs, and HAS-BLED scoring.[8]

References

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Efficacy of Xofluza® over the neuraminidase inhibitors in the treatment of Influenza

Influenza virus consists of two types, Type A and B, which are determined by genes that code for their respective surface antigens. For example, two surface antigens, hemagglutinin (HA) and neuraminidase, are present on influenza type A.[1] On the other hand, influenza type B is separated into two distinct genetic lineages, Yamagata and Victoria, but isn't categorized into subtypes. Influenza type B undergoes antigenic drift less rapidly than influenza type A.[1] Strains of influenza B are exclusively spread by humans, while type A can be transmitted via all animals.[2] Therefore, influenza type A spreads more pervasively than type B and can cause a pandemic with more severe symptoms.[2]

Currently, the most ubiquitous medication class used to treat influenza is the neuraminidase inhibitors (NAI).[3] All influenza viruses contain two glycoproteins, hemagglutinin and neuraminidase, which determine the specific strain of influenza.[3] Neuraminidase cleaves sialic acid, causing the release of the virus and increasing the viral ability to invade neighboring cells.[3] By inhibiting neuraminidase, NAI significantly limits the possibility of viral replication by inhibiting the virus from spreading within the body. [3]

The recent release of a revolutionary drug, baloxavir marboxil, changed the approach in treating influenza. Instead of using neuraminidase inhibitors, which prevents the spread of newly formed virus particles within the host cell by blocking neuraminidase, patients can take baloxavir marboxil instead to stop the viral replication itself. [4] This drug is the first of its kind to inhibit the endonuclease that is essential to reproduce the virus, making it very unique in the drug discovery world.[4]

Compared to oseltamivir (Tamiflu ®) and zanamivir (Relenza ®), which are used to prevent the spreading of the flu virus within the host, baloxavir marboxil is able to alleviate the flu symptoms faster with fewer adverse effects.[4] Also, baloxavir marboxil seems to have better patient adherence due to its one-time dose as compared to oseltamivir which is taken twice a day for 5 days.[4]

Shionogi & Co., Ltd., a pharmaceutical company, conducted a randomized, double-blind, controlled trial involving otherwise healthy outpatients with acute uncomplicated influenza.[5] In this trial, patients between the ages of 12-64 were given either 40-80 mg of baloxavir marboxil, 75mg of oseltamivir twice a day for 5 days, or the placebo during the 2016-2017 flu season.[5] The results show the median time to alleviate their symptoms was 53.7 hours (95% confidence interval [CI], 49.5 to 58.5) with baloxavir marboxil, as compared to 80.2 hours (95% CI, 72.6 to 87.1) with placebo ($P<0.001$).[5] The median time to alleviate symptoms between oseltamivir and baloxavir marboxil were 53.8 hours and 53.5 hours, respectively.[5] Although the median time to alleviate symptoms for baloxavir marboxil was less than oseltamivir, the data isn't clinically significant since the difference is only 0.3 hours.[5] However, baloxavir marboxil had a greater reduction in adverse events compared to the placebo and oseltamivir.[5] For example, adverse events were reported in 20.7% of baloxavir marboxil recipients, 24.6% of placebo recipients, and 24.8% of oseltamivir recipients.[5]

In the previously mentioned trial, the median reduction of viral load from baseline were 4.8, 2.8 and 1.3 $\log_{10}$ $TCID_{50}$ per milliliter in the baloxavir marboxil, oseltamivir, and placebo groups.[5] The reduction in viral RNA loads was also significantly greater with baloxavir marboxil compared to placebo or oseltamivir, concluding that a single dose of baloxavir marboxil was found to be superior to both the placebo and oseltamivir in reducing the viral load 1 day after initiating this regimen.[5]

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