SOP Newsletter

Drug Information News From the School of Pharmacy Faculty Members

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In this edition:

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Word of welcome from the dean

Dear Students,

Year after year, the school of pharmacy at LIU shows great improvements and achievements. Our mission is to be a distinguished institution, where leaders in pharmacy practice, research and education are developed. We are eminent in our curriculum, students, and staff.

Our curriculum helps students develop their personality and expand their knowledge through extensive courses in pharmaceutical sciences, pharmacotherapy, management and marketing, disease management, pharmaceutical care, communication skills and, professional ethics. Since patients are placed at the center of the healthcare equation, and the pharmacist is a major component of this equation, we designed our curriculum to prepare our graduates to fulfill their commitment to patients' care. Also, pharmacy practice comprises a major component of this curriculum where students practice patient care in community and clinical settings under the supervision of highly qualified and dedicated faculty members.

Our students are the center of our education process. Classes are based on problem solving and case discussions where lecture notes are distributed to the students ahead of time. This gives the students the opportunity to be well prepared before attending their classes. Our laboratories are equipped with recent and essential equipments to facilitate the learning outcomes of didactic courses. Furthermore, academic advisors are assigned to every student to guide him/her throughout the years of study. We give our students the opportunity to participate in extracurricular activities in order to build their personalities and develop their skills.

What makes our school distinguished is the real family spirit, integrity and coordination among the faculty members to bring the best atmosphere needed for learning. Regardless of the fact that our staff members come from different educational backgrounds, yet still they all are knowledgeable, dedicated, and professional.

Finally, on the behalf of the faculty and staff of the school of pharmacy at LIU, I would like to welcome all new students who joined us this year and the continuing students, wishing them a fruitful year full of accomplishments and success.

Best regards,

Mohamad Rahal, PhD,
Dean of the School of Pharmacy

TOPIC IN THE NEWS

Fouad Sakr, PharmD.

Middle East respiratory syndrome coronavirus

Key point: Coronavirus infections usually cause mild to moderate upper-respiratory tract illnesses. But in 2003 a coronavirus type caused a severe illness that was known as severe acute respiratory syndrome (SARS-CoV). A novel coronavirus called "Middle East Respiratory Syndrome Coronavirus" (MERS-CoV) was reported in 2012 in Saudi Arabia.

Finer points: Most people who have been confirmed to have MERS-CoV infection developed severe acute respiratory illness. They had fever, cough, and shortness of breath. About half of these people died. Recent data suggest that mild respiratory illness might be part of the clinical spectrum of MERS-CoV infection, and presentations might not initially include respiratory symptoms. In addition, patients with comorbidities or immunosuppression might be at increased risk for infection, severe disease, or both.

Center for Disease Control and Prevention (CDC) is working in consultation with the World Health Organization (WHO) and other partners to better understand the public health risk posed by the MERS-CoV. A total of 114 laboratory-confirmed cases have been reported to the WHO. All reported cases (Table 1) were directly or indirectly linked to one of four countries in or near the Arabian Peninsula.: Saudi Arabia, Qatar, Jordan, and the United Arab Emirates. Most cases (90) were reported by Saudi Arabia. New reports of cases outside the region raise concerns about importation to other geographic areas. In fact, four countries, the United Kingdom (UK), Italy, France, and Tunisia, have reported cases in returning travelers and their close contacts.

Table 1: MERS Cases and Deaths (April 2012 – Present)

Countries	Cases (Deaths)	Countries	Cases (Deaths)
France	2 (1)	Jordan	2 (2)
Italy	3 (0)	Qatar	5 (2)
United Kingdom (UK)	3 (2)	Saudi Arabia	90 (44)
United Arab Emirates (UAE)	6 (2)	Tunisia	3 (1)
Total of 114 (54)			

Testing of specimens for MERS-CoV currently is being conducted at CDC. The U.S. Food and Drug Administration (FDA) issued an Emergency Use Authorization (EUA) to authorize the use of CDC's novel coronavirus 2012 real-time reverse transcription–PCR assay (NCV-2-12 rRT-PCR assay) to test for MERS-CoV in clinical respiratory, blood, and stool specimens. This EUA is needed since there are no FDA-approved tests that identify MERS-CoV in clinical specimens.

To date there is no proven effective treatment. New findings show that a combination of interferon-alpha 2b and ribavirin, drugs routinely used to treat hepatitis C, may be an effective treatment for MERS-CoV infections. These drugs work primarily by moderating the body's immune response to the virus and by promoting repair of damaged lung tissue.

What you need to know: Countries considered in or near the Arabian Peninsula are at the greatest risk of MERS-CoV infection. They are: Bahrain, Iraq, Iran, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, the United Arab Emirates, and Yemen. To date, no cases have been reported in Lebanon.

Source: 1. Gastañaduy PA. Morbidity & Mortality Weekly Report 2013;62(23):480–3.
2. Centers for Disease Control and Prevention. Middle East Respiratory Syndrome (MERS) Available at: http://www.cdc.gov/coronavirus/mers/index.html. Accessed: September 15, 2013.
3. Falzarano et al. Interferon-α2b and ribavirin treatment improves outcome in MERS-CoV-infected rhesus macaques. Nat Med 2013. DOI: 10.1038/nm.3362.

UPDATES IN

NEW DRUG OF THE MONTH

Dalal Hammoudi, MSc

Dolutegravir, a new antiretroviral agent for the treatment of HIV-1 infection

Key point: In August 2013, the U.S. FDA approved dolutegravir (TIVICAY®), a new antiretroviral agent for the treatment of HIV-1 infection. It is an integrase strand transfer inhibitor (INSTI) that is administered orally in combination with other antiretroviral drugs.

Finer points: INSTIs interfere with one of the enzymes necessary for HIV multiplication. They have been developed to inhibit the ability of HIV-1 integrase to irreversibly link the reverse-transcribed viral DNA to the host genome. First-generation INSTIs, such as raltegravir (approved in 2007) and elvitegravir (approved in 2012) have only a modest genetic barrier to resistance, allowing the virus to escape their action through several resistance pathways. Second-generation INSTIs like dolutegravir possess a more robust resistance profile.

Dolutegravir is approved for use in treatment-naïve and treatment-experienced adults, including those who have been treated with other INSTIs. It is also approved for children ages 12 years and older weighing at least 40 kilograms (kg) who are treatment-naïve or INSTI-naïve. The safety and efficacy of dolutegravir in adults was evaluated in 2,539 participants enrolled in four clinical trials.

"Dolutegavir is an integrase strand transfer inhibitor that displays low cross-resistance with other integrase inhibitors"

Depending on the trial, participants were randomly assigned to receive dolutegravir or ralteravir, each in combination with other antiretroviral drugs, or Atripla, a fixed-dose combination of efavirenz, emtricitabine and tenofovir. Results showed dolutegravir-containing regimens were effective in reducing viral loads. Common side effects observed during clinical studies include insomnia and headache. Serious side effects include hypersensitivity reactions and abnormal liver function in participants co-infected with hepatitis B and/or C, hence monitoring of liver aminotransferases is required in these patients.

Manufactured by GlaxoSmithline, dolutegravir is available as 50 mg tablets to be taken orally once daily for treatment-naïve and INSTI-naïve adults and children ages 12 years and older weighing at least 40 kg. For treatment-experienced adults who are INSTI-experienced the dose is 50 mg twice daily. It is administered without regard to meals.

Dolutegravir should be used with caution with other HIV-1 medicines including: efavirenz 902, etravirine, fosamprenavir/ritonavir, nevirapine, or tipranavir/ritonavir. Its plasma concentrations are reduced when coadminsitered with potent UGT1A/CYP3A inducers. When administered with the antiarrythmic dofetilide, it has the potential to decrease dofetilide elimination and therefore this co-administration is contraindicated.

What you need to know: Because integration is a vital step in HIV replication, integrase enzyme is a natural target for treatment; among other integrase inhibitors, dolutegravir is a new entity with the advantage of once-daily dosing and with no need for a pharmacokinetic booster. It also displays low cross-resistance with other integrase inhibitors providing a higher barrier to viral resistance development.

Source: 1. Min S, et al. Antiviral activity, safety, and pharmacokinetics/pharmacodynamics of dolutegravir as 10-day monotherapy in HIV-1-infected adults. AIDS. 2011; 25(14):1737-45.
2. Quashie PK, et al. Characterization of the R263K mutation in HIV-1 integrase that confers low-level resistance to the second-generation integrase strand transfer inhibitor dolutegravir. J Virol. 2012; 86(5):2696-705.
3. Raffi F, et al. Once-daily dolutegravir versus raltegravir in antiretroviral-naive adults with HIV-1 infection: 48 week results from the randomised, double-blind, non-inferiority SPRING-2 study. Lancet. 2013; 381(9868):735-43.
4. Raffi F, et al. Multiple choices for HIV therapy with integrase strand transfer inhibitors. Retrovirology. 2012; 9:110.
5. The US Food and Drug Administration News and Events; news release; August 12, 2013

CARDIOVASCULAR DISEASES

Michelle Cherfan, PharmD.

2013 ESH/ESC hypertension guidelines: BP goal and treatment decisions

Key point: New hypertension guidelines from the European Society of Hypertension (ESH) and the European Society of Cardiology (ESC) were published ahead of the much-anticipated Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-8) guidelines. Although the classification of office blood pressure (BP) is the same as previous guidelines, the new guidelines discuss recommendations concerning the target BP, treatment decisions and initiation of antihypertensive treatment as well as recommendations on treatment of hypertension in the elderly and octogenarians

Finer points: While the optimal BP is <120/80 mm Hg and the normal BP is 120-129 systolic and/or 80-84 diastolic mm Hg, patients with higher BP can be stratified into four categories: high-normal BP (130-139 systolic or 85-89 mm Hg diastolic), grade 1 hypertension (140-159 systolic or 90-99 diastolic mm Hg), grade 2 hypertension (160-179 systolic or 100-109 mm Hg diastolic), or grade 3 hypertension (>180 systolic or >110 mm Hg diastolic). With respect to the diagnosis of hypertension, office BP is recommended for screening and diagnosis based on at least two BP measurements per visit and on at least two visits.

The new guidelines make the recommendation that all patients be treated to <140 mm Hg systolic blood pressure (SBP) more specifically in patients with:

a. Low–moderate Cardiovascular (CV) risk
b. Diabetes
c. Previous stroke or Transient Ischemic Attack
d. Coronary Heart Disease
e. Diabetic or non-diabetic Chronic Kidney Disease (CKD)

But the guidelines do make exceptions for the elderly. In patients younger than 80 years old with SBP ≥160 mmHg there is solid evidence to recommend reducing SBP to between 150 and 140 mmHg, but a SBP <140 mmHg may be considered if the patient is fit and healthy. The same applies to octogenarians, provided they are in good physical and mental conditions.

As for the diastolic BP (DBP), a target of <90 mmHg is always recommended, except in patients with diabetes, in whom values <85 mmHg are recommended. It should nevertheless be considered that DBP values between 80 and 85 mmHg are safe and well tolerated.

"The new guidelines recommend a SBP goal of <140mmHg for all patients"

Decisions for treatment and initiation of therapy should be dictated by the patient's overall level of cardiovascular risk. This is done by assessing the presence or absence of other cardiovascular risk factors (Male sex, age, smoking, dyslipidaemia, obesity and, family history of premature CV disease) or organ damage (OD), the presence or absence of diabetes, overt CV disease, or CKD. Accordingly patients are classified into low, moderate, high and very high risk. Recommendations for the initiation of therapy are:

a. Prompt initiation of drug treatment is recommended in individuals with grade 2 and 3 hypertension with any level of CV risk with lifestyle changes.
b. Lowering BP with drugs is also recommended when total CV risk is high because of OD, diabetes, CV disease or CKD even when hypertension is in the grade 1 range.
c. Initiation of antihypertensive drug treatment should also be considered in grade 1 hypertensive patients at low to moderate risk, when BP is within this range despite a reasonable period of time with lifestyle measures.

What you need to know: The ESH/ESC guidelines simplified treatment decisions and recommended a SBP goal of less than 140 mm Hg for all patients and a DBP goal of less than 90 mm Hg. In patients with diabetes the DBP target is recommended to be <85 mmHg.

Source: Mancia G, et al.2013 ESH/ESC Guidelines for the management of arterial hypertension. Journal of Hypertension. 2013;31(7):1281-1357

ENDOCRINOLOGIC DISORDERS

Diana Malaeb, PharmD.

Approval of canagliflozin for type 2 diabetes therapy

Key point: Canagliflozin is a sodium-glucose co-transporter-2 (SGLT2) inhibitor approved by the FDA in March 2013 for the treatment of type 2 diabetes mellitus (T2DM). It lowers plasma glucose by blocking renal glucose reabsorption inducing glucosuria, as well as increasing the renal threshold for glucose excretion. Its mechanism of action is independent of insulin secretion or action. Consequently, hypoglycemia would not be expected to be a significant side effect. As glucosuria results in loss of calories, weight loss should also result

Finer points: Canagliflozin is administered orally, once daily, at doses between 100-300mg taken before the first meal of the day. It is absorbed rapidly in a dose-dependent fashion and metabolized via glucuronidation by uridine diphosphate glucuronosyltransferase (UGT) 1A9 and UGT2B4 to two inactive O-glucuronide metabolites, with minor metabolism by cytochrome P450 3A4. Dose adjustments are recommended for patients with moderate renal impairment.

"The most common side effects of canagliflozin are mycotic genital infections and urinary tract infections"

When compared to placebo in subjects with T2DM who were suboptimally controlled with diet and exercise for a duration of 26 weeks, canagliflozin at doses of 100mg and 300 mg lowered hemoglobin A1c (HbA1c) by 0.77 and 1.03% respectively, versus 0.14% for placebo.

When used in combinations with other drugs, there was a significant decrease in HbA1c. With metformin, HbA1C decreased by 0.76 and 0.92%, for the 100mg and 300mg respectively. With metformin and a sulfonylurea HbA1C decreased by 0.85 and 1.06%, respectively, versus 0.13% for placebo. Canagliflozin was non-inferior when compared with sitagliptin 100 mg daily added to metformin and a sulfonylurea.

Other monotherapy trials compared to placebo and sitagliptin, canagliflozin demonstrated a statistically significant reductions in systolic blood pressure (-5.1 mmHg), body weight (-1.8 to -2.3 kg) and, fasting plasma glucose (-18 to -25 mg/dL)

The most common adverse effects observed in a pooled analysis of four 26-week placebo-controlled studies involving 2,313 patients were mycotic genital infections and urinary tract infections. Mycotic infections occurred in 10.4% of the patients in the 100 mg group, 11.4% in the 300 mg group, and 3.2% in the placebo group; urinary tract infection occurred in 5.9, 4.3, and 4.0%, respectively. Other effects included thirst, nausea, constipation, and increased urination. Canagliflozin administration resulted in small increases in hematocrit of 1-2%, consistent with osmotic diuresis and resultant mild volume contraction. Hypoglycemia occurred at a similar rate in those receiving canagliflozin and placebo. Dose-related elevations in LDL-C levels in the canagliflozin 100 and 300 mg groups were 4.4 (4.5 % increase) and 8.2 (8.0 %) mg/dL. The etiology of this effect is unclear.

What you need to know: Canagliflozin is indicated as an adjunct to diet and exercise to improve glycemic control in patients with T2DM. It is approved for use either as monotherapy, or in combination with other antidiabetic medications.

Source: 1. Rosenstock J, et al. Dose-ranging effects of canagliflozin, a sodium-glucose cotransporter 2 inhibitor, as add-on to metformin in subjects with type 2 diabetes. Diabetes Care. 2012;35:1232-38
2. Wilding JP, et al. Canagliflozin (CANA), a sodium glucose co-transporter 2 inhibitor, improves glycemic control and reduces body weight in subjects with type 2 diabetes (T2D) inadequately controlled with metformin (MET) and sulfonylurea (SU). Diabetes. 2012;61:A262
3. Stenlof K, et al. Efficacy and safety of canagliflozin monotherapy in subjects with type 2 diabetes mellitus inadequately controlled with diet and exercise. Diabetes Obes Metab. 2013;15:372–82.
4. Schernthaner G, et al. Canagliflozin compared with sitagliptin for patients with type 2 diabetes who do not have adequate glycemic control with metformin plus sulfonylurea. Diabetes Care, Published online before print April 5, 2013;doi:10.2337/dc12-2491

METABOLIC DISORDERS

Mariam Dabbous, PharmD.

Intermittent statin dosing for patients with statin intolerance

Key point: Statin intolerance is very common in the general practice. Most patients could tolerate some type of daily or intermittent statin dose, but about 30% could not tolerate any dose of statin and have to discontinue their medication. Many of these patients who are labeled as statin-intolerant never reach cholesterol treatment target. Thus, it is important to think about novel dosing or trying other agents in the statin-intolerant population.

Finer points: A retrospective study done by Mampuya et al, included 1,605 patients referred to the Cleveland Clinic Preventive Cardiology Section for statin intolerance with at least a six-month follow-up, over about 15 years. The mean low-density lipoprotein cholesterol (LDL-C) level at the first visit to the clinic was 144 mg/dL. During follow-up for a median of 31 months, only 442 patients discontinued statins permanently; another 149 took them intermittently, and 1,014 were able to continue taking them daily.

The most common complaint of statin intolerance was myalgia, with a higher proportion among patients who later took the drugs intermittently; that group also had more neurologic symptoms. There was a higher rate of pancreatitis among patients who stopped taking statins altogether.

Compared to patients who continued on daily statin therapy, the intermittent dosing group had a significantly smaller reduction in LDL-C level (21.3% vs 27.7%, $p<0.001$). However, compared to patients who stopped taking statins entirely, those who took it intermittently had a significantly larger LDL-C reduction (21.3% vs 8.3%, $p<0.001$). Also, a significantly higher percentage of the intermittent-dosing patients attained their Adult Treatment Panel III goal of LDL-C (61% vs 44%, $p<0.05$).

"Intermittent dosing had a significant larger LDL reduction than stopping entirely"

Statin therapy may have had a survival benefit. All-cause mortality at eight years trended toward a decrease for patients on daily and intermittent statin dosing compared with those who discontinued their medication ($p=0.08$).

What you need to know: Intermittent statin dosing can be an effective therapeutic option in some patients and may result in reduction in LDL-C and achievement of LDL-C goals.

Source: Mampuya WM, et al. Treatment strategies in patients with statin intolerance: The Cleveland Clinic experience. Am Heart J 2013;166 (3):597-603.

ONCOLOGIC DISEASES

Samar Younes, PharmD.

FDA approves Nab-Paclitaxel for advanced pancreatic cancer

Key point: In September 2013, FDA approved nanoparticle albumin-bound (nab)-paclitaxel, in combination with gemcitabine, for the first-line treatment of metastatic pancreatic cancer. The drug is specifically approved for adenocarcinoma of the pancreas, a subtype that accounts for about 95% of cancers of the pancreas.

Finer points: The approval was based on results from the MPACT trial, which showed that weekly nab-paclitaxel, a nanoparticle albumin-bound (nab) formulation of paclitaxel, combined with gemcitabine significantly improved both overall survival (OS) and progression-free survival (PFS), when compared with gemcitabine alone.

The phase III MPACT trial enrolled 861 patients who had not received prior chemotherapy for metastatic pancreatic cancer with adenocarcinoma histology. In the trial, patients were randomized in a 1:1 ratio to receive weekly intravenous nab-paclitaxel at 125 mg/m2 plus 1000 mg/m2 of gemcitabine for 3 weeks followed by 1 week of rest (n=431) or 1000 mg/m2 of weekly gemcitabine for 7 weeks with 1 week of rest followed by the same schedule as the investigational arm (n=430).

The nab-paclitaxel arm demonstrated a significantly higher OS than gemcitabine monotherapy. The combination also demonstrated a superior overall response rate of 23% compared with 7% for gemcitabine alone.

The most common adverse reactions with the nab-paclitaxel combination were neutropenia, fatigue, peripheral neuropathy, and nausea. However, there was no increase in life-threatening toxicity.

What you need to know: The past few decades have brought very few treatment advances for patients with advanced pancreatic cancer. The fact that nab-paclitaxel plus gemcitabine demonstrated an overall survival benefit is a significant step forward in offering potential new hope for patients with metastatic pancreatic cancer.

Source: 1. Moore MJ, et al. Prognostic factors (PFs) of survival in a randomized phase III trial (MPACT) of weekly nab-paclitaxel (nab-P) plus gemcitabine (G) versus G alone in patients (pts) with metastatic prostate cancer. J Clin Oncol. 31, 2013 (suppl; abstr 4059)
2. National Cancer Institute. General Information About Pancreatic Cancer.http://www.cancer.gov/cancertopics/

WOMEN'S HEALTH

Sawsan ElHussein, PhD.

Gut microbiata of healthy infants determined profiles by: Pregnant women diet before delivery, mode of delivery, breast feeding and infant diet.

Key point: Gut bacteria play a fundamental role in human health by promoting intestinal homeostasis, stimulating development of the immune system, providing protection against pathogens and contributing to the processing of nutrients and harvesting of energy. The disruption of the gut microbiata has been linked to an increasing number of diseases, including inflammatory bowel disease, necrotizing enterocolitis, diabetes, obesity, cancer, allergies and asthma. The best-studied determinants of the gut microbiata during infancy are: Pregnant women diet before delivery, mode of delivery, breast feeding and infant diet.

Finer points: The influence of the mode of delivery on the gut microbiata was studied. The intestinal tract is sterile at delivery but harbors more than 1017microorganisms in adulthood. It is not clear how the microbiata is established during infancy. But early environmental exposures as delivery mode (vaginal delivery versus delivery by caesarean section) and administration of antibiotics in infancy have previously been found to affect the establishment and diversity of the infants' intestinal microbiata. Cesarean delivery perturbs normal colonization of the infant gut by preventing exposure to maternal microbes. Consequently, infants born by cesarean delivery are at increased risk of asthma, obesity and type 1 diabetes.

An increasing amount of evidence suggests that maternal probiotic supplementation during pregnancy and breast-feeding can determine gut microbiata in infancy and offers beneficial protection. In fact, prevention regimen with specific probiotics administered, prenatally and postnatally, is safe and effective in reducing the risk of eczema in infants with allergic mothers who have a positive skin prick test. Moreover their role in gut microbiata is suggested in the prevention or treatment of cow's milk allergy.

What you need to know: These findings advance our understanding to the gut microbiata in healthy infants and provide new evidence for the effects of delivery mode, prenatal and postnatal administration of probiotics, and infant diet as determinants of this essential microbial community in early life.

Source: 1. Meghan et al. Gut microbiata of healthy Canadian infants: profiles by mode of delivery and infant diet at 4 months. Canadian Medical Association CMAJ.,2013; 185(5): 385-394
2. Young VB. The intestinal microbiata in health and disease. Curr Opin Gastroenterol. 2012; 28(1):63-9
3. Maynard et al. Reciprocal interactions of the intestinal microbiata and immune system. Nature. 2012; 489(7415):231-41
4. Neu J, et al. Cesarean versus vaginal delivery: Long-term infant outcomes and the hygiene hypothesis. Clin Perinatol., 2011; 38(2):321-31
5. Rautava et al. Maternal probiotic supplementation during pregnancy and breast-feeding reduces the risk of eczema in the infant. Journal of allergy and clinical immunology. 2012;130(6):1355-60
6. Canani R et al. Gut microbiata as potential therapeutic target for the treatment of cow's milk allergy. Nutrients. 2013; 5(3):651-62.

ANTIBIOTICS IN INFECTIOUS DISEASES

Nisreen Mourad, PharmD.

Fluoroquinolones: A significant risk for severe dysglycemia in diabetic patients?

Key point: Fluoroquinolones have a broad spectrum of action and are prescribed for many infections including urinary-tract infections, Salmonella bacteremia, community-acquired pneumonia as well as others. This widespread use has raised concerns about the safety of severe dysglycemia associated with their use. Gatifloxacin, was withdrawn from the US market in 2006 because of dysglycemia, therefore, many observational studies are aiming to determine the degree to which other fluoroquinolones can cause such hazard.

Finer points: The results of a population-based cohort study of diabetic patients done in Taiwan were published recently. The researchers examined data for severe dysglycemia from 78,433 outpatients mostly with type 2 diabetes who had received a new prescription for a fluoroquinolone (levofloxacin, ciprofloxacin, or moxifloxacin), second-generation cephalosporins (cefuroxime, cefaclor, or cefprozil), or macrolides (clarithromycin or azithromycin) covering the period between January 2006 and November 2007. They noticed that oral fluoroquinolones were associated with a modest but statistically significant increased risk of dysglycemia; moxifloxacin appeared to have the highest risk of both hypoglycemia and hyperglycemia. In fact, the absolute risk of hyperglycemia per 1000 persons was 6.9 for moxifloxacin compared with 1.6 for macrolides; while the risk of hypoglycemia was 10 and 3.7 respectively.

"Moxifloxacin appears to have the highest risk of dysglycemia"

In addition, they detected a significant increase in the risk of hypoglycemia among patients receiving moxifloxacin concomitantly with insulin or when they presented with comorbid kidney disease. Overall, patients with diabetes faced a greater risk for severe dysglycemia when taking fluoroquinolones than when using other antibiotics from different classes.

What you need to know: Health care providers should cautiously consider the risk of dysglycemia when prescribing fluoroquinolones and should monitor their patients closely for signs and symptoms of disordered glucose regulation, particularly in diabetics.

Source: 1. Chou HW, et al. Risk of Severe Dysglycemia Among Diabetic Patients Receiving Levofloxacin, Ciprofloxacin, or Moxifloxacin in Taiwan. Clinical Infectious Diseases. 2013 doi: 10.1093/cid/cit439
2. http://www.fda.gov/OHRMS/DOCKETS/98fr/cd07129-n.pdf

OTHER DRUGS IN INFECTIOUS DISEASES

Fadi Hdeab, PharmD.

Acceleration of tuberculosis treatment by adjunctive therapy with verapamil

Key point: A major priority in tuberculosis (TB) is to reduce effective treatment times and emergence of resistance. Recent studies in macrophages and zebrafish show that inhibition of mycobacterial efflux pumps with verapamil reduces the bacterial drug tolerance and may enhance drug efficacy.

Finer point: Using mice, a mammalian model known to predict human treatment responses, and selecting conservative human bioequivalent doses, verapamil was tested as an adjunctive drug together with standard TB chemotherapy. As verapamil is a substrate for CYP3A4, which is induced by rifampin, the pharmacokinetic/pharmacodynamic relationships of verapamil and rifampin coadministration in mice was evaluated.

Using doses that achieve human bioequivalent levels matched to those of standard verapamil, but lower than those of extended release verapamil, the researchers evaluated the activity of verapamil added to standard chemotherapy in both C3HeB/FeJ (which produce necrotic granulomas) and the wild-type background C3H/HeJ mouse strains. Relapse rates were assessed after 16, 20, and 24 weeks of treatment in mice.

The researchers determined that a dose adjustment of verapamil by 1.5-fold is required to compensate for concurrent use of rifampin during TB treatment. They found that standard TB chemotherapy plus verapamil accelerates bacterial clearance in C3HeB/FeJ mice with near sterilization, and significantly lowers relapse rates in just 4 months of treatment when compared with mice receiving standard therapy alone.

Conclusions: These data demonstrate treatment shortening by verapamil adjunctive therapy in mice, and strongly support further study of verapamil and other efflux pump inhibitors in human TB.

Source: Gupta S, et al. "Acceleration of Tuberculosis Treatment by Adjunctive Therapy with Verapamil as an Efflux Inhibitor", American Journal of Respiratory and Critical Care Medicine. 2013; 188(5): 600-607.

DRUG REVIEW

Etwal BouRaad, PharmD.

Off label indications of intravenous acetylcysteine

Key point: Intravenous (IV) acetylcysteine is most often used as an antidote for acetaminophen overdose due to its ability to increase levels of glutathione; however, it has also off label indications, and it is used to treat non-acetaminophen-induced acute liver failure (NAI-ALF), severe alcoholic hepatitis, and to prevent contrast-induced nephropathy (CIN). Although the IV and oral formulations of acetylcysteine have been evaluated for these indications, most studies have examined the IV form.

"off label indications are: non-acetaminophen-induced acute liver failure (NAI-ALF), severe alcoholic hepatitis, and prevention of contrast-induced nephropathy (CIN)"

Finer points: In the treatment of NAI-ALF, IV acetylcysteine is used to improve oxygenation to the liver. One large randomized trial of 173 adults included patients with NAI-ALF from any etiology and of any encephalopathy grade. It demonstrated an overall improvement in transplant-free survival, particularly for patients with low-grade encephalopathy, but overall survival was not improved. When used to treat severe alcoholic hepatitis, IV acetylcysteine serves as an antioxidant and a source of glutathione. A trial of 174 patients with severe alcoholic hepatitis revealed that patients had 28-day survival benefit when treated with acetylcysteine; improvement in patients with hepatorenal syndrome was also noted. When used for the prevention of CIN, IV acetylcysteine provides antioxidants and vasodilation. The benefit for this indication is limited to surrogate markers such as serum creatinine and in patients with multiple risk factors for the development of CIN.

What you need to know: Data regarding the use of IV acetylcysteine for the treatment of NAI-ALF and severe alcoholic hepatitis and in the prevention of CIN are inconclusive, though some evidence supports its use in certain populations

Source: Bass S, et al. Intravenous acetylcysteine for indications other than acetaminophen overdose. Am J Health Syst Pharm. 2013;70(17):1496-501

NUTRITION AND SUPPLEMENTS

Marwan Akel, PharmD.

Green coffee bean extract: Does it help?

Key point: Green coffee beans are coffee beans that have not been roasted. The roasting process of coffee beans reduces the concentrations of chlorogenic acid. Thus, green coffee beans have a higher level of chlorogenic acid compared to roasted beans. It is known that chlorogenic acid has antioxidant and anti-inflammatory activities but certain benefits are questioned. These benefits include weight loss and cardiovascular benefits.

Finer points: Weight loss may result from the inhibition of glucose-6-phosphatase that promotes gluconeogenesis, and cardiovascular prevention results from the ability of chlorogenic acid to inactivate lipid metabolism and inhibit its absorption. As a health care professional, a pharmacists' choice must be supported by evidence based medicine and for that reason a search for primary literature about green coffee beans was conducted and surprisingly the results regarding the quality and the quantity of the studies found were disappointing.

Title	Trial Design	Number of subjects	Results
The blood pressure-lowering effect and safety of chlorogenic acid from green coffee bean extract in essential hypertension	Double blind	28	0.48g green coffee extract (140mg chlorogenic acid) failed to reduce weight, but reduced blood pressure and heart rate in pre-hypertensive non-obese persons; the reduction may be temporary as it trended to baseline 2 weeks after cessation
The effect of chlorogenic acid enriched coffee on glucose absorption in healthy volunteers and its effect on body mass when used long-term in overweight and obese people	Double blind	30	440-495mg of chlorogenic acid, via enriched coffee and compared to control (placebo) coffee, is able to reduce weight to a larger degree over 12 weeks in obese persons
Randomized, double-blind, placebo-controlled, linear dose, crossover study to evaluate the efficacy and safety of a green coffee bean extract in overweight subjects	Double blind	16	(Note: all subjects received treatment over the 22 weeks in periods of 8 weeks each, with one period using placebo) Usage of green coffee extract, at 350mg or 700mg in overweight healthy humans, is associated with more weight loss than an 8 week period where placebo is ingested (no weight loss occurred)
Green coffee bean extract improves human vasoreactivity	Double blind	20	140 mg chlorogenic acid (28% content of green coffee extract) for 4 months in persons with impaired vasoreactivity could improve said vasoreactivity; a reduction in homocysteine was also noted

No side effects were noticed in these studies, however, it is important to note that green coffee contains caffeine, therefore it can cause caffeine related side effects like insomnia, nervousness, nausea and vomiting, and increased heart and breathing rate.

What you need to know: Primary literature illustrating the potential benefits of green coffee beans is weak and experts are concerned over the validity of the results. For the time being no clear recommendations are present for the use of this supplement. "The claimed revolutionary new miracle product has nothing magical yet"

Source: 1. Onakpoya I, et al. The use of green coffee extract as a weight loss supplement: a systematic review and meta-analysis of randomised clinical trials. Gastroenterol Res Pract. 2011; 2011: 382852.
2. Watanabe T, et al. The blood pressure-lowering effect and safety of chlorogenic acid from green coffee bean extract in essential hypertension. Clin Exp Hypertens. 2006; 28(5):439-49.
3. Ochiai R, et al. Green coffee bean extract improves human vasoreactivity. Hypertens Res. 2004; 27(10):731-7.
4. Vinson JA, et al. Randomized, double-blind, placebo-controlled, linear dose, crossover study to evaluate the efficacy and safety of a green coffee bean extract in overweight subjects. Diabetes Metab Syndr Obes. 2012;5:21-7
5. Thom E. The effect of chlorogenic acid enriched coffee on glucose absorption in healthy volunteers and its effect on body mass when used long-term in overweight and obese people. J Int Med Res. 2007;35(6):900-8.

GET THE SHOT NOT THE FLU

Jihan Safwan, PharmD.

Need for flu vaccines

Influenza is a serious disease that can lead to hospitalization and sometimes even death. Every flu season is different, and influenza infection can affect people differently, whether healthy or not. Over a period of 31 seasons between 1976 and 2007, estimates of flu-associated deaths in the United States range from about 3,000 to about 49,000 people. During a regular flu season, about 90 percent of deaths occur in people 65 years and older. An annual seasonal flu vaccine (flu shot) is the best way to reduce the chances that you will get seasonal flu and lessen the chance that you will spread it to others.

Mechanism of action of flu vaccines

The "flu shot" is the flu vaccine containing an inactivated vaccine (killed virus). It causes antibodies to develop in the body about 2 weeks after vaccination. There are 3 viruses in it including: **influenza B viruses, influenza A (H1N1) viruses**, and **influenza A (H3N2) viruses**, which can change each year based on international surveillance and scientists' estimations about which types and strains of viruses will circulate in a given year. The flu vaccine is formulated each year to keep up with the flu viruses as they change yearly each.

Eligibility for vaccination

Everyone who is **at least 6 months of age** should get a flu vaccine this season, including:

- People who are at high risk of developing serious complications like pneumonia if they get sick with the flu. This includes:
  - ◊ People who have asthma, diabetes, and chronic lung disease.
  - ◊ Pregnant women.
  - ◊ People ≥ 65 years
- People who live with or care for others who are high risk of developing serious complications. This includes:
  - ◊ Household contacts and caregivers of people with certain medical conditions including asthma, diabetes, and chronic lung disease.

Non-eligibility for vaccination: People who have/are:

- Severe allergy to chicken eggs.
- Had a severe reaction to an influenza vaccination.
- Children < 6 months of age
- Moderate-to-severe illness with a fever → Wait to recover to get vaccinated
- History of Guillain–Barré Syndrome that occurred after receiving influenza vaccine and are not at risk for severe illness from influenza

Vaccine side effects (what to expect)

The viruses in the flu shot are killed (inactivated), so you cannot get the flu from a flu shot. Some minor side effects that could occur are:

- Soreness, redness, or swelling where the shot was given
- Fever (low grade)
- Aches

If these problems occur, they begin soon after the shot and usually last 1 to 2 days.

Source: Influenza Division, National Center for Immunization and Respiratory Diseases, CDC. Prevention and control of seasonal influenza with vaccines. MMWR Recomm Rep 2013; 62:1.

ANNOUNCEMENTS

EVENTS

The faculty members of the school of pharmacy:

- Organized four orientation days for the new students at the school of pharmacy. they were held as follows:
  - ◊ Tuesday 17/09/2013 at Saida and Nabatieh campuses
  - ◊ Wednesday 18/09/13 and Wednesday 25/09/13 at Beirut campuses
  - ◊ Thursday 19/09/13 at Jdeideh Tripoli campuses
  - ◊ Monday 23/09/13 at Khyara Campus
- Marched with the graduating students of Beirut campus the commencement exercises that were held on Friday the 20th of September, 2013 at Biel – Beirut
- Marched with the graduating students of Bekaa campus the commencement exercises that were held on Sunday the 22nd of September, 2013 at Khiara – Bekaa
- Congratulations to all pharmacy graduates!! You deserve the best …. Good luck in your future endeavors

USEFUL LINKS

Pharmacy-related

- LIU e-library: www.liu-elibrary.com
- Order of Pharmacists of Lebanon: www.opl.org.lb
- Ministry of Health: www.moph.gov.lb
- U.S Food and Drug Administration: www.fda.gov
- Center for Disease Control and Prevention: www.cdc.gov

LIU social media

- Facebook: www.facebook.com/liu.edu.lb
- Youtube: www.youtube.com/lebintuni
- Twitter: @lebintuni
- Instagram: @lebintuni
- BBM: 25b43b71

The Scope

- Facebook: www.facebook.com/thescopeliu
- Youtube: www.youtube.com/thescopeliu
- Twitter: @thescopeliu