Clinical Pharmacy Newsletter

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INSIDE THIS ISSUE:

CDK 4/6 inhibitors in Breast Cancer: Evidence of Survival

MONARCH 2 and MONALEESA-3 trial results showed Final overall survival (OS) benefits with the cyclin-dependent kinase 4/6(CDK4/6) inhibitors Abemaciclib and Ribociclib. The new data established by the foundation for adding these drugs to existing endocrine therapy in the treatment of patients with hormone receptor positive, human epidermal receptor negative (HR+/HER2-) for advanced breast cancer (ABC).The results from MONARCH 2 showed that after a median follow-up of approximately 4 years (47.7 months), patients with HR+/HER- advanced breast cancer lived significantly longer with the combination of Abemaciclib and Fulvestrant. Median OS was 46.7 months with the combination and 37.3 months with Fulvestrant alone (hazard ratio [HR], 0.757; 95% confidence interval [CI], 0.606 – 0.945; P = .0137).

A similar benefit was seen with the combination of Ribociclib and Fulvestrant in MONALEESA-3. After a median follow-up of 39.4 months, median OS was not reached with the combination of Ribociclib and Fulvestrant; it was 40.0 months for patients who received Fulvestrant alone (HR, 0.724; 95% CI, 0.568 – 0.924; P = .00455).

The two trials had different patient's populations: MONARCH 2 enrolled premenopausal, peri-menopausal, and postmenopausal patients, whereas MONALEESA-3 enrolled only postmenopausal patients. However, a separate study (MONALEESA-7, which included 1400 patients) reported positive OS results for premenopausal women with HR+/HER2- advanced breast cancer who received Ribociclib and Fulvestrant. Together, the two MONALESSA trials demonstrated a consistent and meaningful benefit with multiple endocrine therapy partners regardless of menopausal status.

New Data are a "Game Changer": The above data is clinically highly meaningful data and are a game changer and will ensure that CDK4/6 inhibitors become the standard of care in treating patients with HR+/HER- ABC and should be used as first line because they substantially improve patient outcomes compared with antihormonal treatment alone. Besides Abemaciclib and Ribociclib, Palbociclib in combination with endocrine-based therapy is also available for use as first-line and second-line settings of ABC. However, the OS data for this agent were not statistically significant.

Choosing Which CDK4/6 Inhibitor to Use First: Adequate number of patients have been followed for long enough and warned that cross-trial comparisons should not be made.

In addition, the HRs from progression-free survival (PFS) and OS are impressive and are similar in the studies. Primary efficacy does not provide any information on the superiority of one drug over the other, but the different toxicity profiles may favor one over the other.

The three CDK4/6 inhibitors are similar in efficacy, but they have distinct side effect profiles. The incidence of neutropenia is higher with Ribociclib and Palbociclib, whereas diarrhea is a concern with Abemaciclib. QTc prolongation is a possible concern with Ribociclib, and patients have to be monitored routinely with electrocardiogram. All three agents have shown similar PFS benefit in their respective trials. However, the OS benefit now reported with Ribociclib and Abemaciclib was statistically significant, whereas Palbociclib was not, although there was a trend showing better survival. This data was taken from the PALOMA-3 trial, which compared the combination of Palbociclib and Fulvestrant with Fulvestrant for patients whose disease had progressed after initial endocrine therapy.

Despite that, patients who received the combination were at a significantly 28% reduced risk for death or progression. The lack of statistical significance was a detail that would most likely be significant, owing to the fact that the benefit of these agents as a class is established. Overall survival (OS) was the secondary endpoint for all three studies that PALOMA-3 was not powered to show significance for OS, and that longer follow-up may be needed. In addition, the patients in PALOMA-3 were heavily pretreated, which is likely to affect clinical outcomes. However, these three studies have key eligibility differences, and cross-trial comparisons are not warranted".

Palbociclib was the first CDK4/6 inhibitor to be approved, and many physicians have a greater comfort level with its use. The overall survival data may provide a boost for Abemaciclib and Ribociclib. However, indications overlap for all three CDK4/6 inhibitors and all are already approved in the second-line settings.Ease of dosing and ease of dose reduction are also factors to take into consideration. Abemaciclib is taken twice daily on a continuous dosing schedule, whereas Ribociclib and Palbociclib are given once daily on a 3-week-on, 1-week-off schedule. Because of its packaging, it is easier to reduce the dose of Ribociclib without writing a new prescription.

In prescribing CDK4/6 inhibitors to patients, it is important to discuss with them the differences between the agents, which in large measure are minor. But sometimes a small difference makes a big difference to a patient. Some patients may prefer continuous dosing with Abemaciclib, whereas others may discount that factor because the drug has to be taken twice daily. Additional sequencing with another CDK4/6 agent, ideally only in the context of a clinical trial. In MONARCH 2, it is reported that subsequent CDK4/6 therapy was provided to 5.8% of patients who experienced disease progression with Abemaciclib and Fulvestrant.

More Details From MONARCH 2: MONARCH 2 randomized pre-, peri-, and postmenopausal patients with HR+/HER- ABC to receive Abemaciclib twice daily on a continuous dosing schedule in addition to Fulvestrant (n = 446) or Fulvestrant alone (n = 223). These patients were endocrine-therapy resistant but had received not more than one prior endocrine therapy, and no chemotherapy for advanced breast cancer.

In addition to the new results for OS, the trial also presented updated data for PFS (the primary endpoint). Median PFS was 16.9 months with the Abemaciclib combination and 9.3 months with Fulvestrant. With a hazard ratio (HR) of 0.536, patients who received the Abemaciclib combination were at a significantly 44% decreased risk for progression or death (P <0.0001). Three-year PFS was nearly three times higher with the Abemaciclib combination: 29.9% vs 10.1% for patients who received Fulvestrant. At three years, three times as many patients on the combination remain progression free [compared those who received Fulvestrant.

Time to initiation of chemotherapy was an exploratory endpoint of the study. The Abemaciclib combination was associated with a 60% delay in the time to initiation of chemotherapy. Median time to initiation was 22.1 months for Fulvestrant, vs 50.2 months for the combination (HR: 0.625; P <0.0001). It is reported that there were no additional safety signals and that the safety profile of Abemaciclib was consistent with that reported in the primary analysis.

More Details From MONALEESA-3: MONALEESA-3 randomly assigned 726 patients with HR+/HER2- ABC to receive addition to Fulvestrant (n = 484) or Fulvestrant alone (n = 242). Approximately 50% of patients received these therapies in the first-line setting. Updated data for the primary endpoint of PFS showed that median PFS was significantly longer for patients who received the combination (20.6 months vs 12.8 months for Fulvestrant; HR, 0.587).

In addition to the median OS results reported above the landmark 3-year OS was 67.0% for patients who received the combination and 58.2% for those who received Fulvestrant. In this second pre specified analysis, the P value crossed the pre specified boundary for establishing superior efficacy. The OS benefits were seen across all subsets of patients, including those distinguished on the basis of site of metastases and line of therapy.

There was a significant delay in time to first chemotherapy. The median time to first chemotherapy was not reached in patients who received the combination; it was 29.5 months for those who received Fulvestrant. No new safety signals were observed and the incidence of grade 3/4 adverse events of special interest with the combination (vs Fulvestrant): Neutropenia: 57.1% vs 0.8%; Hepatobiliary toxicity: 13.7% vs 5.8%; Pulmonary disorders: 0.2% vs 0% (no cases of grade 3/4 pneumonitis or interstitial lung disease were reported) and QTc prolongation: 3.1% vs 1.2% (no episodes of torsades de pointes were observed).

Improvement in Outcomes: Each trial had slightly different patient populations. Importantly, patients in MONALEESA-3 were the least heavily pretreated, whereas those in PALOMA-3 were the most heavily pretreated. As the level of pretreatment increased across the trials, the median PFS also decreased. More heavily pretreated patients will also have a shorter median OS.

In summarizing the data, it is indicated that CDK4/6 inhibitors improved PFS in the first-line and second-line settings of metastatic breast cancer, which translates to an improvement in survival. Improvement in outcomes was seen irrespective of pretreatment, menopausal status, endocrine sensitivity, and site of metastases. A meta-analysis of all the CDK4/6 trials data will likely reveal potential differences in subgroups.

Reference: www.medscape.com/viewarticle/919167#vp_4

DOCTORS ARE NOW PRESCRIBING THIS 'TREATMENT' TO FIGHT CANCER

Once upon a time, patients with cancer were advised to rest and relax, especially after cancer treatment such as chemotherapy, so as not to strain themselves. This isn't so much the case today, when exercise is encouraged for this patient population—and even dosed into treatment regimens.

The ACSM recommends that all physicians ask their patients with cancer about physical activity, and if Inadequate, recommend more.

In the 1990s and 2000s, evidence cropped up that contraindicated previous beliefs that exercise was bad for patients with cancer. In turn, these studies laid the foundation for the burgeoning field of exercise oncology. Today, there are more than 1,000 randomized, controlled trials on the topic. In October 2019, the American College of Sports Medicine (ACSM) convened an expert panel to report recently updated guidelines regarding the role of exercise in cancer survivorship. Let's take their results from the top, and focus on the role of exercise in cancer treatment.

Benefits of Exercise in Cancer:

"The ACSM panel found evidence that providing specific exercise prescriptions for a number of cancer-related health outcomes benefited people living with or beyond cancer," said former ACSM President and panel co-chair Kathryn Schmitz, PhD, MPH, Professor, Departments of Public Health Sciences and Physical Medicine and Rehabilitation, Penn State College of Medicine, Hershey, PA.

"As an example, we saw strong evidence that an exercise program consisting of half hour of aerobic exercise three times weekly was sufficient to improve anxiety, depression, fatigue, quality of life, and physical function in cancer survivors."

Concerns about lymphedema secondary to twice-weekly resistance training have been raised, but the panel found this type of exercise did not increase the risk of disease and even offered some health benefits. However, compared with resistance training alone, symptoms of depression and anxiety have only been shown to improve with resistance training combined with aerobic training.It remains to be elucidated whether exercise also improves other cancer-related outcomes—including cardiotoxicity, peripheral neuropathy, pain, cognitive function, or chemotherapy completion rate—as well as whether exercise boosts treatment tolerance.

In terms of survivorship, exercise prescribed to patients with colon, breast, or prostate cancers has been linked to lengthened survival. However, not enough evidence exists regarding potential survival benefit in those with other types of cancer. On a related note, the ACSM recommends that all cancer survivors heed to general public health recommendations for physical activity, which is either 2.5 to 5.0 hours per week of moderate-intensity activity or 1.25 to 2.5 hours per week of vigorous activity.

Exercise prescription

Years ago, it was unclear to most that exercise is good for the heart, and now everybody knows this thanks to a paradigm shift. Similarly, the ACSM hopes for a paradigm shift in how providers, caregivers, and patients with cancer view exercise as beneficial and necessary in treatment."ACSM has just started a new initiative called Moving Through Cancer," said Dr. Schmitz, "which focuses on increasing awareness of the value of exercise for cancer survivors, along with educating the cancer clinician workforce to refer, coordinate, and prescribe exercise; expanding opportunities to exercise; and shifting policy so that, by 2029, exercise will become a standard practice for all patients living with and beyond cancer."

Importantly, any exercise regimen needs to be personalized to patient preference and functional status. Factors including age, cancer type/stage, adverse effects of treatment, and comorbidities should be taken into consideration.

Counselling patients

Lots of people with cancer don't exercise. These patients should be advised to try some type of physical activity as a means to improve their health. Simply going from no exercise to some exercise is a great improvement. The ACSM recommends that all physicians ask their patients with cancer about physical activity, and if inadequate, recommend more. "Even if that is all providers have time to do, it demonstrates to patients that physical activity is an important part of managing their health and lays out the expectation that being physically active is healthier than being sedentary," said Dr. Schmitz. "This is true even for patients with advanced disease and those experiencing limitations, although those cancer patients will need a medically supervised program."

Bottom line

Physicians are busy professionals. Unpacking the benefit of exercise for your patients will take precious minutes. However, many patients with cancer enjoy exercise programs greatly, and appreciate the guidance in retrospect. Focusing on exercise can be a productive and empowering portion of the clinical encounter. If interested in learning more, the Moving Through Cancer initiative's website provides ample information on high-quality exercise programs and answers to frequently asked questions. Keep in mind that physicians need to refer patients to exercise programs, with most exercise programs requiring physician approval.

INTERNATIONAL CLINICAL ROTATION OF STUDENTS FROM SOUTHERN ILLINOIS UNIVERSITY EDWARDSVILLE, USA

As a part of MOU between JSS Academy of Higher Education & Research, Mysuru and Southern Illinois University Edwardsville, USA, four students Mr. James Reimer, Mr. Caleb Braasch, Ms. Catherine Gilmore and Ms. Lauren Skarupa pursuing fourth year Pharm. D at SIUE visited the Department of Pharmacy Practice, JSS College of Pharmacy, Ooty. The objective of the experiential program is to expose the students to an international rotation focused on public health and infectious diseases that are common in developing countries. The students arrived to Ooty on 10/11/2019 and left on 13/11/2019. During the rotation, the students were introduced to various activities of Clinical Pharmacy department. They were taken to Medicine wards, Paediatrics ward and Intensive care unit of Government Head Quarters Hospital, Ooty. They were actively involved in discussion with Pharm. D V year students and Case presentations by Pharm. D VI year students.

Mr. James Reimer, Mr. Caleb Braasch, Ms. Catherine Gilmore and Ms. Lauren Skarupa from SIUE, USA along with Dr. S. Ponnusankar & Mr. Vishwas H N at Dept. of Pharmacy Practice, JSS College of Pharmacy, Ooty

Mr. James Reimer, Mr. Caleb Braasch, Ms. Catherine Gilmore and Ms. Lauren Skarupa from SIUE, USA along with few Interns & Dr. Khayati Moudgil at ICU of Govt. Head Quarters Hospital, Ooty

Mr. James Reimer, Mr. Caleb Braasch, Ms. Catherine Gilmore and Ms. Lauren Skarupa from SIUE, USA along with few Interns & Dr. Keerthana at Paediatrics ward of Govt. Head Quarters Hospital, Ooty

DRUG PROFILE

CENOBAMATE

Class: Anti-convulsant

Indication: Treatment of partial-onset seizures in adults.

Mechanism of Action:

The exact mechanism of action of Cenobamate is not clearly known. Cenobamate has been demonstrated to reduce repetitive neuronal firing by inhibiting voltage-gated sodium currents. It is also a positive allosteric modulator of the γ-aminobutyric acid ($GABA_A$) ion channel.

Dosage form and Administration:

Cenobamate is available in the form of blister packed tablets with strengths of 12.5mg, 25mg, 50mg, 100mg, 150mg, 200mg of different size, colour and shape. The tablets have different markings on their surface. 28 tablets are available in single blister strip and should be stored within temperatures of 20^0 C to 25^0C.

Tablet Strength	Tablet Color/ Shape	Tablet Markings
12.5 mg	Uncoated round white to off-white tablets	SK on one side and 12 on the other side
25 mg	Film coated round brown tablets	SK on one side and 25 on the other side
50 mg	Film coated round yellow tablets	SK on one side and 50 on the other side
100 mg	Film coated round brown tablets	SK on one side and 100 on the other side
150 mg	Film coated round light orange tablets	SK on one side and 150 on the other side
200 mg	Film coated modified oval light orange tablets	SK on one side and 200 on the other side

Cenobamate dosing should not exceed the recommended dose titration:
Weeks 1-2: 12.5 mg PO once daily initially
Weeks 3-4: 25 mg PO once daily
Weeks 5-6: 50 mg PO once daily
Weeks 7-8: 100 mg PO once daily
Weeks 9-10 150 mg PO once daily

Maintenance dose: Week 11 and thereafter: 200 mg PO once daily
Maximum dose: Based on clinical response and tolerability, dose may be increased above 200 mg by increments of 50 mg once daily for every two weeks to 400 mg PO once daily if needed.

Dosing in Hepatic & Renal Impairment:
For patients with mild to moderate hepatic impairment (5-9 points on Child-Pugh assessment), maximum recommended dose of Cenobamate is 200 mg once daily. Drug is not recommended for use in patients with severe hepatic impairment.

Cenobamate should be used with caution and dosage reduction may be considered in patients with mild to moderate (CLcr 30 to less than 90 mL/min) and severe (CLcr less than 30 mL/min) renal impairment. Use of Cenobamate in patients with end-stage renal disease undergoing dialysis is not recommended

Pharmacokinetics:

Cenobamate C_{max} increases in a dose proportional manner. Steady-state plasma concentrations are attained after approximately two weeks of once daily dosing. The pharmacokinetics of cenobamate are similar when used as monotherapy or as adjunctive therapy for the treatment of partial-onset seizures.

Bioavailability of Cenobamate is 88%following oral administration, with median Tmax ranging from 1-4 hours. No clinically significant differences in pharmacokinetics were observed following administration of a high-fat meal (800-1000 calories with 50% fat).

The apparent volume of distribution (Vd/F) after oral administration is approximately 40-50 L. Plasma protein binding of cenobamate is 60% and independent of concentration in vitro. Cenobamate primarily binds with human albumin protein. Cenobamate is extensively metabolized. The primary metabolic pathways are by glucuronidation via UGT2B7 and to a lesser extent by UGT2B4, and by oxidation via CYP2E1, CYP2A6, CYP2B6, and to a lesser extent by CYP2C19 and CYP3A4/5.

Following administration of radio labelled cenobamate, a mean of 93.0% of the total radioactive dose was recovered in urine (87.8%) and faeces (5.2%). More than 50% of the radioactivity was excreted within 72 hours of dosing. No clinically significant differences in the pharmacokinetics of cenobamate were observed based on age based on data from subjects age 18 years to 77 years, sex, or race/ethnicity based on data from subjects categorized as Asian, Black, Caucasian, Hispanic, or Other.

Adverse Reactions:

The most common adverse reactions in patients receiving Cenobamate include somnolence, dizziness, fatigue, diplopia, and headache.
Cenobamate is also associated with reactions like Eosinophilia and Systemic Symptoms (DRESS)/Multiorgan Hypersensitivity, QT Shortening, Suicidal Behavior and Ideation.

Contraindications:

- Pregnancy: Cenobamate should not be used during pregnancy. No adequate clinical data on exposed pregnancies are available for Cenobamate.
  In animal studies, administration of cenobamate during pregnancy or throughout pregnancy and lactation resulted in adverse effects on development (increased embryo fetal mortality, decreased fetal and offspring body weights, neurobehavioral and reproductive impairment in offspring)

- Safety and effectiveness of Cenobamate in pediatric patients have not been established. Hence, drug is contraindicated in pediatric patients.

Precautions:

- Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS), also known as multiorgan hypersensitivity, has been reported in patients taking XCOPRI. DRESS has occurred, including one fatality, when Cenobamate was titrated rapidly (weekly or faster titration).

- In a placebo-controlled study of the QT interval, a higher percentage of subjects who took Cenobamate (31% at 200 mg and 66% at 500 mg) had a QT shortening of greater than 20 msec.

Precautions: (Cont….)

- Antiepileptic drugs, including Cenobamate increase the risk of suicidal thoughts or behavior. Patients should be monitored for the emergence or worsening of depression, suicidal thoughts or behavior and/or any unusual changes in mood or behavior.

- Cenobamate is known to cause somnolence, fatigue, dizziness, disturbances in gait and coordination, cognitive dysfunction. Patients should be carefully monitored for presence or worsening of the above mentioned symptoms.

Drug Interactions:

- Cenobamate causes decreases plasma concentrations of Lamotrigine, Carbamazepine and Oral contraceptives. Hence, dose of the following drugs should be increased upon concomitant administration with Cenobamate.
- Cenobamate increases drug concentration of Phenytoin by 2 folds. Hence, Phenytoin dose should be reduced upon concomitant administration.
- Cenobamate increases drug concentrations of Phenobarbitone and Clobazam. Hence, doses of Phenobarbitone, Clobazam should be reduced upon concomitant administration with Cenobamate.
- Concomitant administration of Cenobamate with CYP2B6 Substrates and CYP3A Substrates results in reduced efficacy of these drugs. Hence, the dose of both the types of drugs should be increased.
- Concomitant administration of Cenobamate with CYP2C19 Substrates results in increased efficacy of these drugs. Hence, the dose of the CYP2C19 Substrates should be decreased.

Reference:

- https://www.accessdata.fda.gov/drugsatfda_docs/label/2019/212839s000lbl.pdf
- https://reference.medscape.com/drug/xcopri-cenobamate-1000328#0

ANTIPLATELET THERAPY BEFORE SURGERY-WHEN TO STOP ?

Surgical bleeding risk level	*Cardiac risk level*		
	*Low risk**	*Intermediate risk†*	*High risk‡*
Low risk§	Maintain aspirin or clopidogrel (Plavix)	Elective surgery: okay Maintain aspirin Maintain clopidogrel, if prescribed	Elective surgery: postponement Vital or urgent surgery: possible under aspirin and clopidogrel
Intermediate risk‖	Maintain aspirin or clopidogrel	Elective surgery: according to risk balance Vital surgery: okay Maintain aspirin Maintain clopidogrel, if prescribed	Elective surgery: postponement Vital or urgent surgery: possible under aspirin and clopidogrel
High risk¶	Stop aspirin or clopidogrel if necessary (five days before surgery) Restart within 24 hours after surgery	Elective surgery: postponement Vital surgery: okay Maintain aspirin Stop clopidogrel five days before surgery, if prescribed; restart within 24 hours after surgery	Elective surgery: postponement Vital or urgent surgery: okay Maintain aspirin Stop clopidogrel five days before surgery; possible substitution three to five days before surgery with intravenous tirofiban (Aggrastat) or eptifibatide (Integrilin)**

ACS = acute coronary syndrome; CABG = coronary artery bypass grafting; ENT = ear, nose, and throat; MI = myocardial infarction; PCI = percutaneous coronary intervention.

**—More than three months after PCI, bare-metal stenting, or CABG; more than six months after ACS or MI; more than 12 months after regular drug-eluting stenting.*

†—Six to 12 weeks after PCI, bare-metal stenting, or CABG; six to 24 weeks after ACS or MI; more than 12 months after high-risk drug-eluting stenting.

‡—Less than six weeks after PCI, bare-metal stenting, CABG, ACS, or MI (less than three months if complications); less than 12 months after drug-eluting stenting—may be longer in cases of high-risk drug-eluting stenting. These delays can be modified according to the amount of myocardium at risk, the instability of the coronary situation, or the risk of spontaneous hemorrhage. The same recommendations apply to newer second-generation drug-eluting stenting.

§—Peripheral and wall surgery, minor ENT and orthopedics, endoscopy without biopsy or resection, eye anterior chamber, or dentistry; transfusion not required.

‖—Visceral and vascular surgery, major ENT and orthopedics, urology, endoscopy with biopsy or resection; transfusion may be required.

¶—Cardiac surgery, surgery with massive bleeding, surgery in closed space (intracranial, intramedullary canal, posterior eye chamber); transfusion required.

***—Off-label use of platelet glycoprotein IIb/IIIa inhibitors may be considered, although there are no data regarding effectiveness and safety.*

Adapted with permission from Chassot PG, Delabays A, Spahn DR. Perioperative antiplatelet therapy: the case for continuing therapy in patients at risk of myocardial infarction. Br J Anaesth. 2007;99(3):322.

Ref: American Association of Family Physicians (https://www.aafp.org/afp/2010/1215/p1484.html)

EVENT CORNER

REPORT

Dr S Ponnusankar, Professor & Head, Department of Pharmacy Practice, JSS College of Pharmacy attended the International conference, 'ISPE's 12th Asian Conference on Pharmacoepidemiology, an International conference' organized by International Society of Pharmacoepidemiology at Kyoto Exhibition Hall, Kyoto, Japan on 11th to 13th October- 2019.

Dr S Ponnusankar, Professor & Head, Department of Pharmacy Practice, JSS College of Pharmacy presented a paper entitled 'Understanding of medication adherence and patient satisfaction in low socio-economic hypertensive elderly patients visiting a public hospital in South India' at 'ISPE's 12th Asian Conference on Pharmacoepidemiology, an International conference' organized by International Society of Pharmacoepidemiology at Kyoto Exhibition Hall, Kyoto, Japan on 11th to 13th October-2019.

Dr. S. Ponnusankar presenting a Research Paper at 'ISPE's 12th Asian Conference on Pharmacoepidemiology, at Kyoto

Dr. S Ponnusankar, Professor & Head, Dr. K P Arun, Asst. Professor, Dr. M. Deepalakshmi, Dr. Swathi Swaroopa, Mr. Vishwas H N, Dr. R Santhosh Kumar, Lecturers, Dr. C Keerthana, Dr. Khayati Moudgil, Residents of Department of Pharmacy Practice attended the National level conference, 'AICTE sponsored International Conference on Current regulations for medical devices and in vitro diagnostics' organized by Department of Pharmaceutics & Pharmaceutical Regulatory Affairs held at JSS College of Pharmacy, Ooty on 18th and 19th October 2019.

Dr. R. Santhosh Kumar, , Lecturer, Department of Pharmacy Practice attended the National level lecture series, 'DBT Sponsered Popular Lecture series on Biotechnology' organized by Department Pharmacology held at JSS College of Pharmacy, Ooty on 3rd and 18th October 2019.

Mr. Vishwas H N, Lecturer, Department of Pharmacy Practice attended the National level Conference, '2nd Pharmaceutical sciences Congress-2019' organized by Indian Association of Colleges of Pharmacy and St. Peter's Institute of Pharmaceutical Sciences, Warangal, Telangana on 1st and 2nd November, 2019.

Dr. K P Arun, Asst. Professor, Department of Pharmacy Practice acted as a Resource person and delivered a talk on 'Precision Medicine - The Way Forward' at a National level seminar, 'National Seminar on Recent Advances in Treatment of Neuro Degenerative Disorder' organized and held at by Excel College of Pharmacy on 21st November 2019.

Dr. Dr. M Deepalakshmi, Lecturer, Department of Pharmacy Practice acted as a Resource person and delivered a talk on 'Recent Advances in Treatment of Dementia' at a National level seminar, 'National Seminar on Recent Advances in Treatment of Neuro Degenerative Disorder' organized and held at by Excel College of Pharmacy on 21st November 2019.

Dr. K P Arun, Asst. Professor, Department of Pharmacy Practice acted as a Resource person and delivered a talk on 'Precision Medicine - The Way Forward' at National level conference, '10th National conference on Pharmacoeconomics and Outcome Research' organized by ISPOR India Andra Pradesh City Chapters & IPA Hospital Pharmacy Division at Raghavendra Institute of Pharmaceutical Education & Research, Ananthapuram, Andhra Pradesh on 22nd and 23rd November 2019.

Dr. Dr. M Deepalakshmi, Lecturer, Department of Pharmacy Practice presented a paper entitled, 'An Online module series to prepare pharmacists to facilitate cognitive pharmaceutical services' at National level conference, '10th National conference on Pharmacoeconomics and Outcome Research' organized by ISPOR India Andra Pradesh City Chapters & IPA Hospital Pharmacy Division at Raghavendra Institute of Pharmaceutical Education & Research, Ananthapuram, Andhra Pradesh on 22nd and 23rd November 2019.

Dr. G K Sadagoban acted as a Resource person and delivered a talk entitled, 'Current Scenario of Pharm D Program' during the 'Orientation Lecture - Pharm. D Students' at Sree Krishna College of Pharmacy and Research Centre, Thiruvananthapuram on 30th November 2019.

Dr. G K Sadagoban being felicitated after his talk at Sree Krishna College of Pharmacy and Research Centre, Thiruvananthapuram

Ms. B S Roopa , Lecturer, Department of Pharmacy Practice attended a National level workshop, 'Short course on Biostatistics and epidemiology for clinical and public health research using SPSS' organized by Department of Biostatistics (college campus), Christian Medical College, Bagayam, Vellore on 9th to 12th December 2019.

PUBLICATIONS FROM THE DEPARTMENT OF PHARMACY PRACTICE (October-December, 2019)

1. Ponnusankar S, Rangadham P, Roy D, Kutty JJ, Manu P, Stanly S. Assessment of Poisoning pattern, Severity and Clinical outcome using Clinical Scoring Systems in secondary care public hospital in South India. Research Journal of Pharmacy and Technology. 2019;12(10):4767-70.
2. Veeves A, Moudgil K. A Case of Proceeding Polycystic Kidney Progress to the End Stage Renal Failure. Journal of Global Pharma Technology. 2019;11(10):10-12.
3. Deepalakshmi M, Santhoshkumar R, Sajna SJ, Arun KP. Knowledge, Attitude and Perception of Pharmacist & Physician Towards Generic Drug Use - A Cross Sectional Study. International Journal of Scientific & Technology Research. 2019;8(11):3352-3358.
4. Chandrasekar K, Sudarsan P, Rangan M. Cefotaxime Induced Pyrexia in a Pediatric Patient with First Degree Burns: A Case Report. International Journal Pharmaceutical Sciences Review and Research. 2019; 56(2):44-46.
5. Kumar RS, Ponnusankar S. Aluminium Phosphide (Slow) Poisoning: A Narrative Case Review. International Journal of Scientific & Technology Research. 2019;8(12):414-421.
6. Chandrasekar K, Sai NG, John PS, Ninan S, Durai R, Ponnusankar S. Emerging Non-Pharmacological Therapies for Post-stroke Depression and its Future Aspects: A Review. Indian Journal of Pharmaceutical Education and Research, 2020; 54(1):1-7

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