JSS ACADEMY OF HIGHER EDUCATION & RESEARCH
(DEEMED TO BE UNIVERSITY) MYSURU

CLINICAL PHARMACY NEWSLETTER

A Newsletter of Drug and Prescribing Information

Published by
Clinical Pharmacy Services Department, Govt. Medical College & Hospital, Ooty
(A Unit of Department of Pharmacy Practice, JSS College of Pharmacy, Ooty)

Volume XXVII Issue 01 **January - March 2021**

INSIDE THIS ISSUE

'Hidden' Danger of Type 2 Diabetes Diagnosis at Early Age

Those who are found to have Type 2 Diabetes at a younger age face "hidden" dangers. The issue is becoming more and more important, since new diagnoses in this younger age group continue to rise. And the belief is that the clinical approaches should be based on age at diagnosis. The results of new meta-analysis, published online in Diabetologia (2021;64(2):275-287) reveal the extent of the problem.

Believed to be the first systematic review, the study shows that the younger the age at diagnosis of Type 2 Diabetes, the greater the risks of dying and of having either microvascular or macrovascular complications each subsequent year (adjusted for current age). This difference in risk between younger and older people in terms of absolute vs lifetime risks of Type 2 Diabetes complications should perhaps be recognized in diabetes management guidelines. Those diagnosed at younger ages are more likely to develop complications that cause greater disability and lead to loss of productivity compared with people diagnosed at an older age. Hence, the author suggests a greater emphasis on preventive measures for younger people with Type 2 Diabetes with early intensive multifactorial risk factor intervention sustained long-term to minimize risks over time.

Large Dataset: Use Age at Diagnosis to Risk Stratify Patients:

Rates of Type 2 Diabetes have increased in all age groups and virtually all countries over the past three decades. Particularly worrying is a trend toward increased rates among adults aged 20 to 44 years. The increases are associated with higher rates of overweight and obesity, poor diet, and decreasing levels of physical activity, numerous studies have shown. But few studies have examined the association between age at diagnosis and subsequent complications from Type 2 Diabetes.

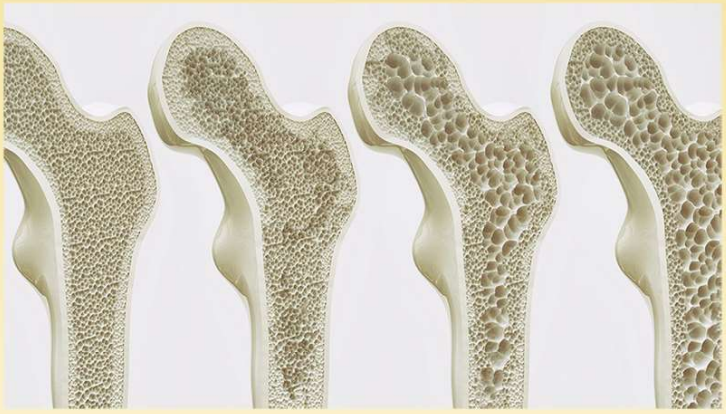
Their review included 26 observational studies involving more than one million individuals from 30 countries in the Asia Pacific, Europe, and North America.The investigators found that each 1-year increase in age at diabetes diagnosis was significantly associated with a 4%, 3%, and 5% decreased risk for all-cause mortality, macrovascular disease, and microvascular disease, respectively, adjusted for current age (all $p < .001$. Similar decreases in risk per 1-year increase in age at diabetes diagnosis were seen for coronary heart disease (2%), cerebrovascular disease (2%), peripheral vascular disease (3%), retinopathy (8%), nephropathy (6%), and neuropathy (5%); all associations were significant ($p < .001$). Further, it is noted that current treatment guidelines are limited in that they're related to the management of patients with suboptimal blood glucose control, and there is no way to predict which people require intensified treatment.

Reference: Nanayakkara et al, Diabetologia 2021;64(2):275-287

Long-term Treatment with Bisphosphonates? – New Evidence

Women treated with oral bisphosphonate drugs for osteoporosis for 5 years get no additional benefit in terms of hip fracture risk if the treatment is extended for another 5 years. Hip fracture risk in women did not differ if women stopped bisphosphonate use after 5 years or stayed on the medication for 10 years. The new study, published in JAMA Network Open (2020;3(12): e2025190) did show a small benefit in continuing the treatment through 7 years vs 5 years, but it wasn't clear if this was significant. Whether there is a benefit to staying on the drug for 7 years needs to be further studied in randomized trials.

It is well established that oral bisphosphonates are effective in reducing the risk for fracture within the first 3 to 5 years of treatment; however, evidence on the effects of treatment beyond 5 years is lacking. The most recent guidance from the American Society of Bone and Mineral Research (ASBMR) on the issue, which were released in 2015, recommends continuation of bisphosphonates beyond 5 years for high-risk patients, but it recommends a "drug holiday" for low-risk patients.



Normal Bone and Osteoporotic Bone

Study adds important new evidence:

However, guidance acknowledges that data are limited regarding long-term use. This large study adds important new evidence to the discussion. It is new data and suggests that it might temper the enthusiasm for long-term treatment with bisphosphonates. Importantly, it is the first large observational trial and is closer to a real-world setting than a randomized controlled trial. This study would suggest that patients can probably be given a drug holiday for a couple of years they should be retested, and if they appear to be at an increased risk of fracture, they probably should restart again. Osteoporosis is a chronic disorder, and it isn't cured by any treatment, and as people get older, they are at a higher fracture risk. Patients should be followed for a lifetime and reassess their fracture risk every couple of years whether they are still on therapy or on a drug holiday.

Possible that 7 Years is better than 5 but remains to be proven:

The new study involved data from 29,685 women who had completed 5 years of treatment with oral bisphosphonates, including Alendronate, Risedronate, or Ibandronate, between 2002 and 2014. Among the women, 11,105 (37%) continued taking the drugs beyond 5 years to 7 years, and 2725 (9.2%) completed a total of 10 years of treatment. Their median age was 71. Among those for whom bone mineral density data were available, 37% had osteoporosis after the first 5 years of treatment. During these 5 years of treatment, 507 hip fractures occurred. The cumulative incidence of hip fracture among for those who discontinued study therapy at entry, ie, those who underwent treatment for 5 years, was 23.0 per 1000 individuals. After 7 years of treatment, the rate was 20.8 per 1000. For those who continued therapy for 10 years, the rate was 26.8 per 1000 individuals.

The rate in the 7-year treatment group was based on patients taking a 6-month drug holiday after the initial 5 years, but the results are hard to interpret. It's possible that 7 years is better than 5, but this is not a randomized trial, and some of the data analyses done in the study suggest more research should be done to look at a benefit after 7 years.

Limitations: subgroups not identified, adherence hard to assess:

The uncertainty of any benefit of treatment with bisphosphonates beyond 5 years is further reflected in US recommendations. The US Food and Drug Administration has concluded on the basis of pooled data from the extension phase of major clinical trials that any advantages of treatment beyond 3 to 5 years are unclear. Key limitations of the current study include the fact that the incidence of hip fracture was not evaluated in low-risk vs high-risk subgroups; therefore, these findings may not be applicable to older women at higher risk of osteoporotic fracture.

Furthermore, the study did not assess outcomes of fractures other than hip fractures, such as vertebral fractures etc. And the other limitation is that adherence in the trial was defined as taking 60% of prescribed pills. This is the biggest weakness with the study and particularly with medications like oral bisphosphonates that don't really make patients feel any different, it's a real challenge to make sure patients continue to take these drugs properly. The findings should give some reassurance for patients who take a break from the drugs after 5 years. However, reassessment of their risk is critical.

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Reference: Izano et al., JAMA Netw Open . 2020; 3(12):e2025190.

DRUG PROFILE
VILOXAZINE

Class:
Selective norepinephrine reuptake inhibitor

Indication:
Viloxazine is used for the treatment of Attention Deficit Hyperactivity Disorder (ADHD) in pediatric patients (6 to 17 years of age)

Mechanism of Action:
Exact mechanism by which Viloxazine acts is unclear; however, it is thought to show action by selectively inhibiting norepinephrine reuptake.

Dosage form and Administration:
Viloxazine is available as extended-release capsules with doses of 100, 150 and 200 mg with the following characteristics:

- 100 mg: yellow opaque body and cap (printed "SPN" on the cap, "100" on the body)
- 150 mg: lavender opaque body and cap (printed "SPN" on the cap, "150" on the body)
- 200 mg: light green opaque body and cap (printed "SPN" on the cap, "200" on the body)

Viloxazine can be administered orally with or without food. Patients should be advised not cut, crush, or chew the capsules. Patients can be further advised to swallow capsules whole or open the capsule and sprinkle the entire contents over a teaspoonful of applesauce. Patient should consume all the sprinkled applesauce in its entirety, without chewing, within 2 hours.

The recommended starting dosage of Viloxazine for pediatric patients 6 to 11 years of age is 100 mg orally once daily. Dosage may be titrated in increments of 100 mg at weekly intervals to the maximum recommended dosage of 400 mg once daily, depending on response and tolerability.

The recommended starting dosage for pediatric patients 12 to 17 years of age is 200 mg orally once daily. After 1 week, dosage may be titrated by an increment of 200 mg to the maximum recommended dosage of 400 mg once daily, depending on response and tolerability.

Dosing in Hepatic & Renal Impairment:
The effect of hepatic impairment on the pharmacokinetics of Viloxazine is unknown. Hence, Viloxazine is not recommended in patients with hepatic impairment.

No dosage adjustment of Viloxazine is recommended in patients with mild to moderate renal impairment (eGFR of 30 to 89 mL/min/1.73m2). In patients with severe renal impairment (eGFR < 30 mL/min/1.73m2), the recommended starting dosage is 100 mg once daily.

Dosage may be titrated in weekly increments of 50 to 100 mg once daily, to a maximum recommended dosage of 200 mg once daily.

Pharmacokinetics:
Viloxazine C_{max} and AUC increase proportionally over a dosage range from 100 mg to 400 mg once daily. Steady-state was reached after two days of once-daily administration, and no accumulation was observed in studies. Administration of 200 mg Viloxazine extended-release with a high-fat meal (800 to 1000 calories) decreased Viloxazine C_{max} and AUC by about 9% and 8%, respectively. Viloxazine Tmax increased by about 2 hours after administration with a high-fat meal. Sprinkling the contents of a capsule on applesauce decreased Viloxazine C_{max} and AUC by about 10% and 5%, respectively.

Bioavailability of Viloxazine was about 88%. T_{max} was approximately 5 hours, with a range of 3 to 9 hours, following a single 200 mg dose. Viloxazine is 76-82% bound to human plasma proteins over the blood concentration range of 0.5 mcg/mL to 10 mcg/mL. The mean (± SD) half-life of Viloxazine was 7.02 ± (4.74 hours).

Adverse Reactions:
>10%: Somnolence (12-19%), Headache (10-11%)
1-10%: Fatigue (4-9%), Decreased appetite (5-8%), Upper respiratory tract infections (5-8%), Abdominal pain (3-7%), Nausea (1-7%), Vomiting (3-6%), Insomnia (2-5%), Irritability (2-5%), Pyrexia (1-3%)

Contraindications:
• Viloxazine is contraindicated in patients with concomitant administration of monoamine oxidase inhibitors (MAOI), or dosing within 14 days after discontinuing an MAOI.

• Viloxazine is contraindicated in patients with concomitant administration of sensitive CYP1A2 substrates or CYP1A2 substrates with a narrow therapeutic range.

Precautions:
• In clinical studies, higher rates of suicidal thoughts and behaviour were reported in paediatric patients with ADHD treated with Viloxazine compared to patients treated with placebo.

• Patients treated with Viloxazine reported higher rates of insomnia and irritability.

• Viloxazine can cause increased heart rate and diastolic blood pressure. Periodic monitoring of BP and heart rate is suggested.

• Noradrenergic drugs such as Viloxazine may induce a manic or mixed episode in patients with bipolar disorder.
• Viloxazine can cause somnolence and fatigue. Patients should not perform activities requiring mental alertness, such as operating a motor vehicle or operating hazardous machinery until they tolerate Viloxazine.

• Based on findings from animal reproduction studies, Viloxazine may cause maternal harm when used during pregnancy. Drug needs to be carefully used during pregnancy.

Drug Interactions:
• Concomitant use of Viloxazine with an MAO inhibitors (Selegiline, Isocarboxazid, Phenelzine, Tranylcypromine, Safinamide, Rasagiline) may lead to a potentially life-threatening hypertensive crisis. This drug combination is contraindicated.

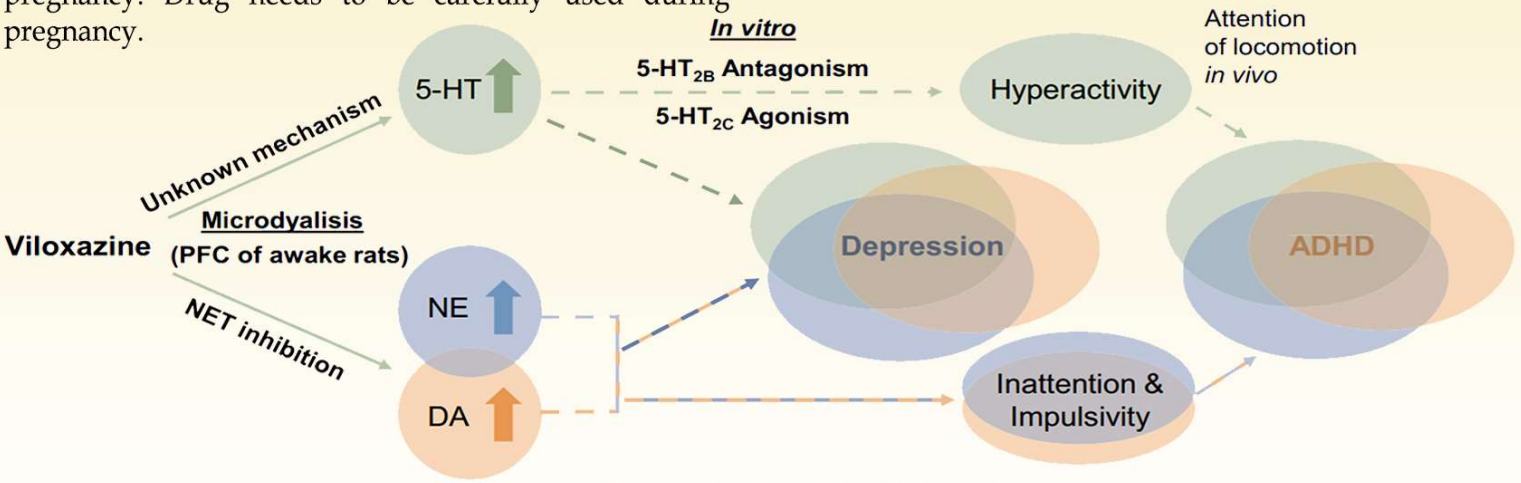
• Viloxazine is a strong CYP1A2 inhibitor. Concomitant use of viloxazine significantly increases the risk of adverse reactions associated with CYP1A2 substrates (Alosetron, Duloxetine, Ramelteon, Tasimelteon, Tizanidine, Theophylline, Clozapine, Pirfenidone). This drug combination is contraindicated.

• Viloxazine is a weak inhibitor of CYP2D6, and increases the exposure of CYP2D6 substrates when co-administered (Atomoxetine, Desipramine, Dextromethorphan, Nortriptyline, Metoprolol, Nebivolol, Perphenazine, Tolterodine, Venlafaxine, And Risperidone). Patients should be monitored for adverse reactions and adjust dosages of CYP2D6 substrates

•Viloxazine is a weak inhibitor of CYP3A4 which increases the exposure of CYP3A4 substrates when co-administered (Alfentanil, Avanafil, Buspirone, Conivaptan, Darifenacin, Darunavir, Ebastine, Everolimus, Ibrutinib, Lomitapide, Lovastatin, Midazolam, Naloxegol, Nisoldipine, Saquinavir, Simvastatin, Sirolimus, Tacrolimus, Tipranavir, Triazolam, Vardenafil, And Lurasidone). Patients should be monitored for adverse reactions and adjust dosages of CYP3A4 substrates

Reference:
1. https://www.accessdata.fda.gov/drugsatfda_docs/label/2021/211964s000lbl.pdf#page=18

2. https://www.qelbree.com/



Proposed dual mechanism of VILAZOXINE

Adopted from: Yu C, Garcia-Olivares J, Candler S, Schwabe S, Maletic V. New Insights into the Mechanism of Action of Viloxazine: Serotonin and Norepinephrine Modulating Properties. J Exp Pharmacol. 2020;12:285-300

Different types of COVID Viruses and Importance of Gene sequencing:

According to the World Health Organization (WHO), viral diseases continue to emerge and represent a serious issue to public health. In the last twenty years, several viral epidemics such as the Severe Acute Respiratory Syndrome coronavirus (SARS-CoV) in 2002-2003, and H1N1 influenza in 2009, have been recorded. Most recently, the Middle East Respiratory Syndrome coronavirus (MERS-CoV) was first identified in Saudi Arabia in 2012. An epidemic of cases with unexplained low respiratory infections was first detected in Wuhan, the largest metropolitan area in China's Hubei province, was first reported to the WHO Country Office in China, on 31 December 2019.

CoVs are positive-stranded RNA viruses with a crown-like appearance under an electron microscope (coronam is the Latin term for crown) due to the presence of spike glycoproteins on the envelope. The subfamily Orthocoronavirinae of the Coronaviridae family (order Nidovirales) classifies into four genera of CoVs: Alphacoronavirus (alphaCoV), Betacoronavirus (betaCoV), Deltacoronavirus (deltaCoV), and Gammacoronavirus (gammaCoV). Furthermore, the betaCoV genus divides into five sub-genera or lineages. Genomic characterization has shown that probably bats and rodents are the gene sources of alphaCoVs and betaCoVs. On the contrary, avian species seem to represent the gene sources of deltaCoVs and gammaCoVs. Members of this large family of viruses can cause respiratory, enteric, hepatic, and neurological diseases in different animal species, including camels, cattle, cats, and bats. To date, seven humans CoVs (HCoVs) capable of infecting humans have been identified. Some of HCoVs were identified in the mid-1960s, while others were only detected in the new millennium.

In general, estimates suggest that 2% of the population are healthy carriers of a CoV and that these viruses are responsible for about 5% to 10% of acute respiratory infections.

• Common human CoVs: HCoV-OC43, and HCoV-HKU1 (betaCoVs of the A lineage); HCoV-229E, and HCoV-NL63 (alphaCoVs). They can cause common colds and self-limiting upper respiratory infections in immunocompetent individuals. In immunocompromised subjects and the elderly, lower respiratory tract infections can occur.

• Other human CoVs: SARS-CoV, SARS-CoV-2, and MERS-CoV (betaCoVs of the B and C lineage, respectively). These cause epidemics with variable clinical severity featuring respiratory and extra-respiratory manifestations. Concerning SARS-CoV, MERS-CoV, the mortality rates are up to 10% and 35%, respectively.

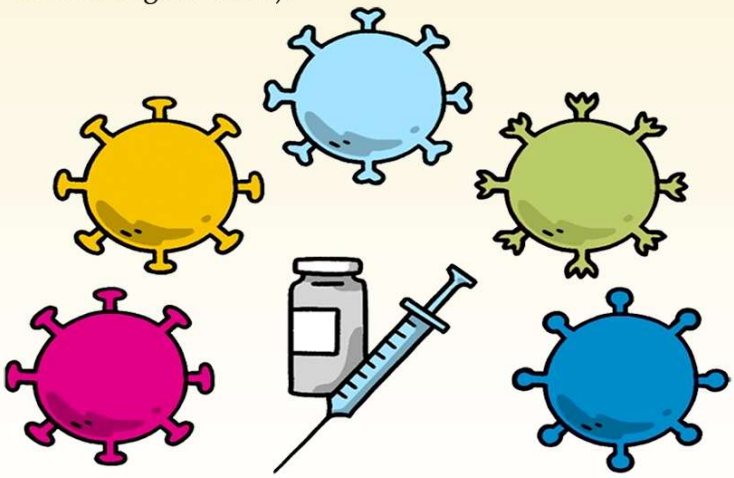
Importance of Genomic sequencing of SARS-CoV-2:
Recent advances have allowed the genomes of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) – the causative agent of COVID-19 – to be sequenced within hours or days of a case being identified. As a result, for the first time, genomic sequencing in real time has been able to inform the public health response to a pandemic. Metagenomic sequencing was fundamental to the detection and characterization of the novel pathogen. Early sharing of SARSCoV-2 genome sequences allowed molecular diagnostic assays to be developed rapidly, which improved global preparedness, and contributed to the design of countermeasures. Rapid, largescale virus genome sequencing is contributing to understanding the dynamics of viral epidemics and to evaluating the efficacy of control measures. Increased recognition that viral genome sequencing can contribute to improving public health is driving more laboratories to invest in this area. However, the cost and work involved in gene sequencing are substantial, and laboratories need to have a clear idea of the expected public health returns on this investment.

Gene sequencing enabled the world to rapidly identify SARS-CoV-2 and develop diagnostic tests and other tools for outbreak management. Continued genome sequencing supports the monitoring of the disease's spread and evolution of the virus. Accelerated integration of genome sequencing into the practices of the global health community is required if we want to be better prepared for the future threats. World Health Organization is constantly working with many Governments on enhancing the healthcare facilities and performing genomic sequencing of various COVID causing viruses.

Reference:

•Features, Evaluation, and Treatment of Coronavirus (COVID-19). Marco Cascella; Michael Rajnik; Arturo Cuomo; Scott C. Dulebohn; Raffaela Di Napoli. Treasure Island (FL): StatPearls Publishing; 2021 Jan.

•Genomic sequencing of SARS-CoV-2: a guide to implementation for maximum impact on public health (World Health Organization).



Event Corner

- Dr M Deepalakshmi, Lecturer, Department of Pharmacy Practice participated in 90-Days Certificate Course in 'Basics of Cardiac Pharmacology' organized by CliMed Research solutions in collaboration with World Youth Heart Federation (WYHF) and Indian Pharmaceutical Association Student Forum (IPA-SF) from October- December 2020.

- Dr S Ponnusankar, Professor & Head, Department of Pharmacy Practice participated in the national level webinar on 'Impact of COVID 19 on Pharmaceutical Education and Research' organized by Society of Pharmaceutical Sciences and Research (SPSR) on 8th January 2021.

- Dr M Deepalakshmi, Lecturer, Department of Pharmacy Practice participated in '55th Annual Conference of The Indian hospital pharmacist's association (IHPA)&The hospital pharmacy foundation' organized by Bengal School of Technology (A College of Pharmacy), Sugandha, West Bengal on 16th January 2021.

- Dr M Deepalakshmi, Lecturer, Department of Pharmacy Practice presented oral presentation entitled 'Impact of pictogram usage for reporting ADRs of antiretroviral therapy' and received 'Best oral presentation' award during the '55th Annual Conference of The Indian hospital pharmacist's association (IHPA) & The hospital pharmacy foundation' organized by Bengal School of Technology (A College of Pharmacy), Sugandha, West Bengal on 16th January 2021.

Dr M Deepalakshmi receiving the 'Best oral presentation' award through virtual event from Bengal School of Technology (College of Pharmacy), Sugandha, West Bengal on 16th January 2021

- Dr K P Arun, Asst. Professor, Department of Pharmacy Practice participated in webinar 'National Workshop NIRF India Rankings -2021 for Higher Educational Institutions Awareness Programme' organized by Institute for Academic Excellence, Hyderabad on 18th and 19th January 2021.

- Dr M Deepalakshmi, Lecturer, Department of Pharmacy Practice participated in national level conference on 'Medication Management: Challenges, Practices and The Role of Clinical Pharmacist in Respiratory Disorder' organized by Deccan's International Webinar Team, Deccan School of Pharmacy on 21st January 2021.

- Dr. Roopa B S, Lecturer, Department of Pharmacy Practice participated in online event 'National Seminar on development of Biologicals in India: Significance of Industry- Academia collaboration, regulatory requirements, challenges, opportunities, and strategies' organized by National Institute of Pharmaceutical Education and Research- Guwahati on 21st and22nd January 2021.

- Dr M Deepalakshmi, Dr B Swathi Swaroopa, Dr Keerthana C, Mr Vishwas H N, Facutly from Department of Pharmacy Practice participated in the national level 'Two-day workshop on JMP Software Training for statistical analysis' organized by JSSAHER Mysuru and JSS College of Pharmacy, Ooty on 22nd and 23rd January 2021. (Resource Person: Dr Muralidhara A, JMP Academic Ambassador, India).

- Mr Vishwas H N, Lecturer, Department of Pharmacy Practice participated and delivered a talk on 'NABH: Management of Medications Criteria-9: Narcotic drugs Psychotropic substances Chemotherapeutic agents and Radioactive agents are used safely' during the national level conference on 'Management of Medicines (as per NABH Standards April-2020) with the theme of Quality & Accreditation are responsibilities of each Hospital Pharmacist' organized by Siddaganga Foundation in association with Department of Pharmacy Practice, Sree Siddaganga College of Pharmacy & Siddaganga Hospital and Research centre, Tumkur, Karnataka on 24th January 2021 (22/01/2021-26/01/2021).

Mr Vishwas H N along with Mr Ravinandan A P, Asst Professor, Department of Pharmacy Practice, Sree Siddaganga College of Pharmacy at Sree Siddaganga Hospital & Research Centre, Tumkur, Karnataka (24th January 2021)

- Mr Vishwas H N, Lecturer, Department of Pharmacy Practice participated and delivered Guest lecture on 'How to use PowerPoint effectively' and 'Model Case Presentation' to students of B Pharmacy and Pharm D at Sree Siddaganga College of Pharmacy, Tumkur, Karnataka on 25th January 2021.

- Dr B S Roopa, Lecturer, Department of Pharmacy Practice acted as 'Reviewer' for the virtual conference "Virtual ISPOR 2021: Research Abstract Review".

- Dr S Ponnusankar, Dr M Deepalakshmi, Dr Roopa B S, Dr Keerthana C, Mr Vishwas H N, Faculty, Department of Pharmacy Practice participated in the online webinar on 'Contemporary updates on Research and Publication' organized by JSS Dental College & Hospital Institutional Ethics Committee, Mysuru on 19th February 2021.

- Dr. S Ponnusankar, Professor & Head, Department of Pharmacy Practice participated in online webinar on 'Countering the rise of superbugs through antimicrobial resistance' organized by National Society of Pharmaceutical Sciences and Research (SPSR) on 21st February 2021.

- Dr. S Ponnusankar, Dr M Deepalakshmi, Dr Keerthana C, Dr Aneena Suresh, Faculty, Department of Pharmacy Practice participated in online webinar on 'Virtual Mymedex 2021 Webinar Series 1 – Innovations in Healthcare' organized by Myevents International on 25th February 2021.

- Dr K P Arun, Asst Professor, Department of Pharmacy Practice acted as a Resource person and delivered a talk on 'Pharmacogenomics and Drug safety' during the 'AICTE Sponsored 2-week Quality Improvement Program for Faculty on MEDICATION SAFETY INCLINICAL PRACTICE' organized by Bharati Vidyapeeth (Deemed to be) University Poona College of Pharmacy from 1st-13th February 2021.

- Dr Roopa B S, Lecturer, Department of Pharmacy Practice was identified as 'Reviewer of manuscript' for the Journal 'PLOS ONE' on 26th February 2021.

- Dr Aneena Suresh, Lecturer, Department of Pharmacy Practice was identified as 'Reviewer of manuscript' for 'Journal of Pharmaceutical Research International'.

PUBLICATIONS FROM THE DEPARTMENT OF PHARMACY PRACTICE

(January-March 2021)

- Som S, Antony J, Dhanabal SP, **Ponnusankar S.** Phytochemical profiling of Hemidesmus indicus (l.) R. Br. Ex schult and its antioxidant, anti-inflammatory and neuroprotection linked enzyme inhibitory properties. Pharmacognosy Journal. 2021;13(1).

- Som S, Antony J, Dhanabal S P, **Ponnusankar S.** Evaluation of neuroprotective potential of methanolic extract of Hemidesmus indicus extract in Aβ (1-42) induced rats. International Journal of Research in Pharmaceutical Sciences. 2020; 11(4): 7495-7502.

- **Deepalakshmi M**, Vijay V, Navaneethakrishnan S, Manikandan P, Arun K P, & Ponnusankar S. An online module series to prepare pharmacists to facilitate cognitive pharmaceutical services. International Journal of Research in Pharmaceutical Sciences. 2021; 12(1): 66-71.

- Swathi SB, Prithika SI, Shiva SV, Manasa K, Rudrani T, **Sadagoban G K**. . Identification and evaluation of medication errors in pre- and post-operative setting. International Journal of Pharmaceutical Research. 2021; 13(1):4681-4690.

- **Swathi SB**, Bhavya C, Poojitha T, Bright FJS, Sadagoban GK, Arun K P. Effect of Oct3 Genetic polymorphism on the response of Metformin in Type 2 Diabetes mellitus: Narrative Review. Journal of Global Pharma Technology. 2021; 13(02):27-33.

- **Sadagoban GK**, Venkatasubbaiah M, Arun KP, Swathi SB. Case series on the clinical evidence of Phenytoin toxicity: Is Ranitidine a cause? International Journal of Pharmaceutical Research. 2021; 13(2):1182-1188.

- Patnool RB, Wadhwani A, Balasubramaniam V, **Ponnusankar S**. Need for the implementation of antibiotic policy in India: an overview. International Journal of Current Research and Review 2021; 13(05): 168-178.

- **Keerthana C**, Saju SJ, Zechariah B H, John J A, Sadagoban GK, Arun KP. Drug Utilization Evaluation of Aminoglycosides, Gentamicin and Amikacin: A Retrospective study in pediatric patients at secondary care public hospital. Research J. Pharm. and Tech 2021; 14(3):1247-1250.

- Tamilselvan S, William DB, Jagadeesan S, **Aneena S**. Impact of pharmacist-given patient - counseling on health - related quality of life (HRQOL) of haemodialysis patients. J Evolution Med Dent Sci 2021;10(12):856- 860,

For clarifications/ feedback, write to:

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