An Official Publication of

VIVEKANANDHA
PHARMACY COLLEGE FOR WOMEN

Veerachipalayam, Sankagiri, Tamil Nadu - 637 303.

Volume: 2
Issue: 1
January - April
2024

PHARMA BEACON - VPCW EDITION

EXPERT DESK

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BIOMARKER TEST APPROVED FOR PREDICTING PREECLAMPSIA PROGRESSION

Preeclampsia (PE) is a pregnancy related disorder characterized by hypertension and proteinuria noticeable after 20 weeks of gestation. It is a leading cause of maternal and fetal mortality and morbidity worldwide. The etiology of the disease is unknown, but recent studies have revealed that this disorder appears to originate in placenta and is characterized by widespread maternal endothelial dysfunction. Till date, delivery of placenta is the only cure for the disease. So, there is a need for the identification of highly specific and sensitive biochemical markers that would allow early identification of patients at risk and thus help in providing proper prenatal care [1].

An ideal biomarker of preeclampsia is the one that would allow an accurate prediction during the first trimester as it offers a wide window of opportunity for effective treatment that may help in complete recovery or reduce the severity. Several promising biomarkers have been proposed, alone or in combination, that may help in predicting women who are likely to develop PE. Assessment of the antiangiogenic factor, soluble fms-like tyrosine kinase 1 (sFlt-1), and the proangiogenic factor, placental growth factor (PlGF) in maternal blood may be useful [2].

In the Preeclampsia Risk Assessment : Evaluation of Cut-offs to Improve Stratification (PRAECIS) study of hospitalized patients with a hypertensive disorder of pregnancy between 23+0 and 34+6 weeks of gestation, those with sFlt-1:PlGF below the threshold had <5 percent chance of developing sFP within two weeks, while those above the threshold had a 65 percent chance of developing sFP [1]. Based on these findings, in May 2023, the US Food and Drug Administration approved use of the sFlt-1:PlGF test for pregnant patients hospitalized for a hypertensive disorder of pregnancy. Clinicians may find use of this test along with other laboratory tests and clinical assessments helpful for managing these patients [2].

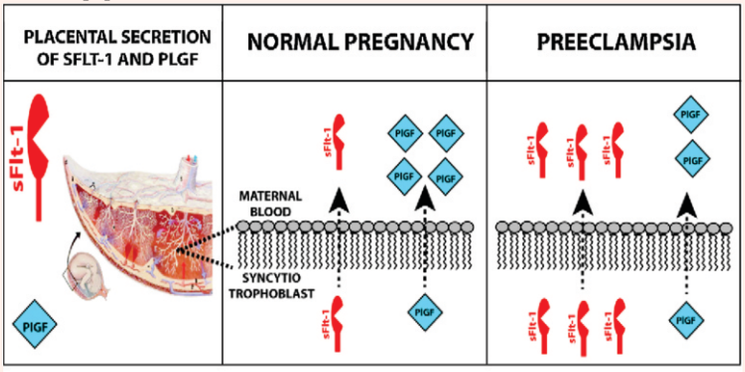

Fig: Placental secretion of SFLT-1 and PLGF in normal pregnancy and preeclampsia.

Dear Reader / Health Care Professionals,
send your queries to :
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1. Thermo Fisher Scientific announces FDA clearance of breakthrough immunoassays to aid in the risk assessment of preeclampsia. News release. Thermo Fisher Scientific. Available from : https://www.businesswire.com/news/home/20230519005071/en/Thermo-Fisher- Scientific-Announce FDA-Clearance-of-Breakthrough-Immunoassays-to-Aid-in-the-Risk-Assessment-of-Preeclampsia. Accessed May 19, 2023.
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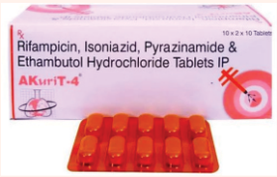
MANAGEMENT OF DRUG INDUCED HEPATITIS

Tuberculosis (TB) is a chronic bacterial infection caused by Mycobacterium tuberculosis complex, most commonly by Mycobacterium tuberculosis, and is usually characterized pathologically by the formation of granulomas [1]. The most common site of infection is the lung, but other organs may be involved including the kidney, spine and brain, skin, etc.



The cornerstone of TB management is a 6-month course of using anti-TB drugs where isoniazid (INH), rifampicin (RIF), pyrazinamide (PYZ), and ethambutol (EMB) are taken for 2 months in the intensive phase followed by a fourth month use of isoniazid and rifampicin in the continuous phase of managing protocols of the disease [2].

One of the adverse effects affecting TB treatment outcome is anti-TB drug induced hepatotoxicity. Among the first-line anti-TB drugs, isoniazid, rifampicin, and pyrazinamide are known to cause hepatotoxicity, but pyrazinamide attribute to a higher percentage for the drug induced liver toxicity compared to the other drugs [1]. Even though the first-line anti-TB drugs are effective, their liver toxicity may lead to drug interruption; which can in turn be the cause for the development of Multi-Drug Resistant Tuberculosis (MDR-TB). Order of hepatotoxicity include – PYZ > INH > RIF.

Hepatotoxicity is usually presented and diagnosed with jaundice or a liver function test (LFT) with high concentration of liver function marker proteins like aspartate aminotransferase (AST) / alanine aminotransferase (ALT), alkaline phosphatase (APT), or total bilirubin [2].

If ALT is more than three times of normal range and the patient is symptomatic or five times the normal range without symptom, please follow the following guideline :

Hold all TB drugs for 7-10 days (Wait until symptoms resolve and liver enzyme is < than 2.5 times upper limit of normal) before re-starting Anti-Tubercular Therapy (ATT).

Note: Patients with severe TB should be treated with Streptomycin, Ethambutol, and Levofloxacin until they are well enough to attempt re-introduction. Most patients with ATT drug - induced hepatitis will tolerate re-introduction of all first line drugs.

Ethambutol is not hepatotoxic so it should be started on Day 1 at full dose. Regarding the Pyrazinamide, if the patient has liver disorder, not re-introduce it.

Day	Drug And Dose	Remarks
1	RIF 300mg + EMB	If patient remains asymptomatic
2	RIF 450mg + EMB	If patient remains asymptomatic
3	RIF 600mg + EMB	If patient remains asymptomatic; Check LFT
4	INH 100mg + EMB	If patient remains asymptomatic
5	INH 200mg + EMB	If patient remains asymptomatic
6	INH 300mg + EMB	If patient remains asymptomatic; Check LFT
7	PYZ 400mg + EMB	If patient remains asymptomatic
8	PYZ 800mg + EMB	If patient remains asymptomatic
9	PYZ 1200mg + EMB	If patient remains asymptomatic; Check LFT

Drug Omitted	Total Duration	Intensive Phase	Continuation Phase
RIF	18 months	Isoniazid, Levofloxacin, Ethambutol, Streptomycin (2 months)	Isoniazid, Levofloxacin, Ethambutol (16 months)
INH	12 months	Rifampicin, Levofloxacin, Ethambutol, Streptomycin (2 months)	Isoniazid, Levofloxacin, Ethambutol (10 months)
PYZ	9 months	Isoniazid, Rifampicin, Ethambutol (9 months)	-

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1. National-Tuberculosis-Management-Guidelines-2019_Nepal.pdf (nepalntp.gov.np)
2. Molla Y, Wubetu M, Dessie B. Anti-tuberculosis drug induced hepatotoxicity and associated factors among tuberculosis patients at selected hospitals, Ethiopia. Hepatic Medicine: Evidence and Research. 2021 Jan 28:1-8.

By

Mr. M. SELVAKUMAR, M.Pharm.,

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PREVENT UNCONTROLLED, RAPID INFUSION RATES : CONFIRM THE INFUSIONS ARE CONNECTED TO PUMPS BEFORE OPENING THE CLAMP!

Problem: The administration of certain IV medications had recently led to errors associated with uncontrolled IV infusion rates that should have been administered through smart infusion pump at a controlled rate [1].

Event # 1: Oxytocin was being administered to the patient through dial-a-flow which resulted in hyperstimulation and patient was rushed to emergency for C-section. On observation, it was found that number of drops of oxytocin that were being administered, were more than the drops required to cause therapeutic stimulation. This scenario could have been prevented by administering oxytocin via controlled infusion device.

Event # 2: A patient accidentally received a bolus dose of phenylephrine (20mg/250ml) in OpwOR, which should have been administered through an infusion pump slowly. The error was identified by an anesthesiologist during the procedure when abrupt increase in blood pressure was observed. The root cause identified was the alarm by the pump indicating “air in line”.

The contributing factors identified after investigations includes :

- Inadequate supply of infusion pumps.
- Pumps are used only for “high-risk medications”.
- The infusion rates are not confirmed before initiation.
- Responding inappropriately to infusion pump alarms.
- Time limitations and interruptions.

Safe administration recommendations [2]

- Follow safety standards.
- Provide an adequate supply of smart infusion pumps.
- Dose-error reduction systems should be employed while administering all infusions.
- Label and trace the infusion lines for proper connectivity.
- Pump alarms should be responded correctly.
- Report time limitation issues to prevent a possible error.
- Train staff about the consequences of administering the infusion at a faster rate.

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1. Institute for Safe Medication Practices (ISMP). Prevent uncontrolled, rapid infusion rates: confirm infusions are connected to pumps before opening the clamp! ISMP Medication Safety Alert! Acute Care. 2022;27(15):1.
2. Smith EA, Gray G. Developing a smart infusion pump dedicated to Infusion Safety. Ergonomics in Design. 2022;30(2):4-12.

By

Dr. C. AROKIA RANI, Pharm. D.,

Assistant Professor, Department of Pharmacy Practice, VPCW.

ARTIFICIAL INTELLIGENCE AND ITS INNOVATION IN PHARMACY

Artificial Intelligence (AI) refers to the science and engineering of making intelligent machines and software that can reason, learn, gather knowledge, communication, manipulate and perceive the objects through algorithms or a set of rules, which the machine follows to mimic human cognitive functions [1]. McCarthy coined the term in 1956 as branch of computer science concerned with making computers that behave like humans.

Applications of AI [1,2]

Healthcare System	Pharmaceutical Industry	Hospital and Community Pharmacy
❖ Maintaining medical records. ❖ Treatment plan designing. ❖ Assisting in repetitive tasks. ❖ Health support and medication assistance. ❖ Accuracy of medicine. ❖ Drug creation. ❖ Improved primary and end care.	**Drug discovery** - Drug design - Drug screening **Product Development** - Identify suitable excipient - Monitor development process **Clinical trials** - Subject enrolment - Patient drop out - Trial monitoring **Manufacturing** - Automated and Personalized manufacturing	❖ Identifying patterns in medication errors and adverse drug reactions. ❖ Predict adverse events in hospitals and formulate preventative measures. ❖ Anticipating possible drug–drug interactions. ❖ Personalized advice about medication usage, diet changes, lifestyle modifications, and treatment plans. ❖ Therapeutic drug monitoring. ❖ Maintain an optimal inventory, minimizing stock outs and overstock.

Applications of AI [1,2]		
Healthcare System	**Pharmaceutical Industry**	**Hospital and Community Pharmacy**
	- Identify cause of errors **Product management** - Market positioning - Marketing analysis/prediction - Product costing **QA/QC** - Understand critical process parameters - Guide future production cycle - Regulation of in line quality - Laboratory management system	❖ Assists in advancing public health monitoring.

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1. Al Meslamani AZ. Applications of AI in pharmacy practice: a look at hospital and community settings. Journal of Medical Economics. 2023;26(1):1081-1084.
2. Holzinger A, Langs G, Denk H, Zatloukal K, Müller H. Causability and explainability of artificial intelligence in medicine. Wiley Interdisciplinary Reviews: Data Mining and Knowledge Discovery. 2019;9(4):1312.

By

Dr. R. ABIRAMI, Pharm. D.,

Assistant Professor, Department of Pharmacy Practice, VPCW.

STUDENT OUTREACH ACTIVITIES

We celebrated **"PONGAL FESTIVAL"** on **11th January 2024** at our College.

We celebrated **"REPUBLIC DAY"** on **26th January 2024** at our College.

We conducted "**ROAD SAFETY AWARENESS RALLY**" at Sankari on **02nd February 2024.**

We conducted "**SOCIAL JUSTICE AND HUMAN RIGHTS AWARENESS RALLY**"
at RTT Campus on **28th February 2024.**

We celebrated **"NATIONAL SCIENCE DAY"** on **28th March 2024** at VPCW Seminar hall.

We celebrated "**NATIONAL PHARMACY EDUCATION DAY**" on **06th March 2024** at VPCW Seminar hall.

We celebrated "**INTERNATIONAL WOMEN'S DAY**" on **08th March 2024** in Srinivasa Mahal.

Students of VPCW have attended **one Day National Level Seminar** on **"TRANSFORMATIVE ADVANCES IN PHARMACEUTICAL EDUCATION: ELEVATING SKILLS AND EMBRACING INNOVATION FOR RESEARCH REVOLUTION"** held on **09th March 2024** at The Erode College of Pharmacy, Erode.

Dr. NAGHUL ADHITHYA K S has been awarded **Third Place** in E-Quiz competition faculty category conferred during the Annual event of Association of Pharmaceutical Teachers of India, Tamil Nadu state branch held at The Erode College of Pharmacy, Erode on **09th March 2024.**

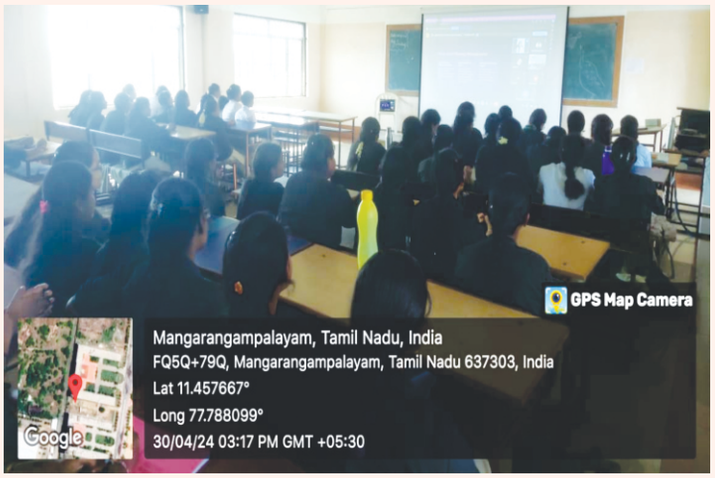
Department of Pharmaceutical Chemistry has organized guest lecture for our students on the topic of **"UNLOCKING THE START-UP OPPORTUNITIES"** presented by Dr. Nirmal Robinson on **16th March 2024** at VPCW seminar hall.

Department of Pharmacognosy has organized guest lecture for our students on the topic of **"CELLULAR STRESS AND CANCER"** presented by Dr. Nirmal Robinson on **18th March 2024** at VPCW seminar hall.

We conducted "**GRADUATION DAY**" on **06th April 2024** at **VEI Auditorium,** Tiruchengode.

Department of Pharmaceutical Chemistry has organized guest lecture for our students on the topic of "**APPLICATIONS OF HIGH THROUGHPUT SCREENING TECHNOLOGIES IN DRUG DISCOVERY**" presented by Dr. A. Senthil Raja on **13th April 2024** at VPCW seminar hall.

Students of VPCW have attended **Two Days National Conference** on "**EMERGING EXCELLENCE IN CARDIAC CARE**" held on **25th & 26th April 2024** at **Paavai College of Pharmacy,** Namakkal.



Department of Pharmacy Practice has organized webinar for our students on the topic "**NAVIGATING THE SPECTRUM - EXPLORING THE ROLES AND RESPONSIBILITIES OF CLINICAL PHARMACIST**" on **30th April 2024** at VPCW Seminar hall.

VIVEKANANDHA EDUCATIONAL INSTITUTIONS

"Vidhya Rathna"

Prof. Dr. M. KARUNANITHI, B.Pharm., M.S., Ph.D., D.Litt.,

Chairman & Secretary

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- ★ SWAMY VIVEKANANDHA PHYSIOTHERAPY COLLEGE
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★★★

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