Thalidomide was introduced in 1961 as a nonbarbiturate sedative agent. It was prescribed to treat morning sickness in pregnant women. The drug was withdrawn for the major birth defects (phocomelia). \[1\]

Figure 1. Children were born with phocomelia as a side effect of the drug thalidomide, resulting in the shortening or absence of limbs (adapted from: https://helix.northwestern.edu/article/thalidomide-tragedy-lessons-drug-safety-and-regulation)

After several decades gradually, thalidomide was re-entered in the market for the treatment of some inflammatory conditions as well as in neoplastic conditions. However, the drugs tragedy disaster, another side, the drug was tested for various other indications with the caution drug should not be given to the pregnant women or the drug not given for the women at child bearing age. Recently, revealed the pharmacological mechanism of action of thalidomide on cytokine modulation and reduced TNF-α production also inhibits angiogenesis in tumor tissues. \[3\] This leads to the drug regain its power to re-enter into the market for the treatment of some inflammatory conditions as well as in neoplastic conditions.

Several open-label clinical trial investigations and many case studies reports have revealed the effects of thalidomide in systemic disorders such as Crohn’s disease, rheumatoid arthritis, ankylosing spondylarthritits. \[2, 4\] However, minor but dose-limiting side effects were commonly occurred. Thalidomide analogs, lenalidomide with better acceptability profiles are under evaluation. Lenalidomide is a highly effective treatment for multiple myeloma. Recent studies have revealed that thalidomide, lenalidomide, and pomalidomide show novel pharmacologic mechanism of action. \[5\] Another recent study explained the use of systemic injection of thalidomide to prevent and attenuate neuropathic pain and alleviate neuroinflammatory response in the spinal dorsal horn. \[6\] Further, thalidomide is limited or warned to use in reproductive age female, a recent study reported that Thalidomide results in diminished ovarian reserve in reproductive age female IBD patients. \[7\] However, the drug is beneficial in patients with limitations. Already the drug is reintroduced with Blackbox warning. By analyzing the risk: benefit ratio and the major consideration of its teratogenic effect the drug used with warning as well as for newer indications.

**References:**

Consistent aerobic exercise for a minimum of 30 minutes every day brings enormous change in the body which includes improved cognitive functions, healthy gene expressions, coping with stress, work memory, productivity, improved academic performance amongst children, preventing and treating neurological disorders and improvement in the quality of life.\(^1\) β-Endorphin an endogenous opioid neuropeptide binds with μ-opioid receptors causing a euphoric sensation and pain relief. Regular exercise increases the synthesis of β-Endorphin which improves the mood which is linked with overall activity of the person.\(^2\) Aerobic exercises increase plasma anandamide concentration. Anandamide is an endogenous cannabinoid neurotransmitter that binds to cannabinoid receptors, causing euphoria and analgesic sensation and reduces anxiety amongst athletes.\(^3\)

Cortisol is released from the adrenal glands by activating the hypothalamic-pituitary-adrenal axis in response to psychological stress. It is a glucocorticoid that binds to glucocorticoid receptor enhancing inhibitory control and cognitive improvement if there is a short term increase in cortisol levels. If prolonged, it can impair cognitive functioning and can have a neurotoxic effect. Aerobic exercise stimulates the cortisol secretion in an intensity dependent manner. Aerobic exercise increases physical fitness and lowers neuroendocrine reactivity and reduces the biological response to psychological stress in humans.\(^4\)

Glutamate, one of the most common neurochemicals in the brain, is an excitatory neurotransmitter involved in many aspects of brain function, including learning and memory. Exercise helps in normalizing the excessive levels of glutamate neurotransmission into the nucleus accumbent that occurs in drug addiction cases also.\(^5\)

Regular exercise improves the level of neurotransmitters and increases the pain threshold and improves over all physical and mental well-being of the individual.

**References:**


Statistics shows that the number of older populations is projected to be increased 2.1 million by 2050 globally. Two thirds of elder population live in the developing countries and their numbers are rising faster than in developed countries1. As the average age of population goes on increasing it is again the burden of the healthcare professional to provide better and quality of life to the elder population. Osteoarthritis (OA) is a common form of physical disability among the elder population. It generally affects the hands, knees, hips and spine. It is no longer considered as “wear and tear” condition, it is an unavoidable consequence of ageing2.

In Ageing, recent findings shows that glycation end products tend to accumulate in human cartilage affects the biochemical, biomechanical and cellular characteristics of the tissue; increases the cartilage stiffness and brittleness3.

Gender has an impact on Osteoarthritis, women at an increasing age has a higher chance of getting osteoarthritis compared to that of men; arthritis of women affects hands or knees. Reasons include biology, genetics and hormones. Women’s tendons in the lower body are more elastic than men’s which is more prone for injury. Female hormones regulate the cartilage which acts between the bones of the joints and cushions the bones thereby it allows the joints to move smoothly and prevents the pain which is the prime symptoms of OA4.

“Stepping away from OA includes Prevention, Progression and Disability”. Various studies have proved that continuous exposure to oxidants leads to the development of age-related diseases like OA. There is an evidence that potent sources of reactive oxygen species (ROS) are chondrocytes. ROS damages cartilage collagen and synovial fluid hyaluronate. Hence high dietary intake of micronutrient antioxidants (Ascorbic acid, vitamin E, Beta Carotene and other Carotenoids) and Non-antioxidants (vitamin D, vitamin B group- Niacinamide, Folate and Cobalamine, and glucosamine) can be helpful to protect against OA5.

**REFERENCES:**

Olecranon bursitis is a common inflammatory condition where the bursal cavity, superficial to the olecranon, becomes inflamed. This can occur either with or without infection and has been given pseudonyms relating to the repeated minor trauma from external pressure that often occurs in people who study whilst leaning on their elbows on a desk, it is called ‘student's elbow’. Other names include ‘miner’s elbow’, ‘plumber’s elbow’, etc, when the job involves crawling a lot using elbows

Most commonly, olecranon bursitis is a non-infective,post-traumatic, inflammatory response to repetitive, minor trauma.[1] The most common causes of Olecranon bursitis are
1. Long term pressure for example, when it occurs in people who study whilst leaning on their elbows on a desk, it is called 'student's elbow'. Other names include 'miner's elbow', 'plumber's elbow', etc, when the job involves crawling a lot using elbows
2. A sudden injury- A hard hit or a bow to the elbow causes bleeding
3. Repeated elbow movements may be a cause in certain athletes. For example, those whose sports involve throwing by raising the arm above the head (such as cricket or baseball players, javelin throwers) or weightlifters.

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those whose sports involve throwing by raising the arm above the head (such as cricket or baseball players, javelin throwers) or weightlifters.

4. Medical conditions - few medical conditions like gout and arthritis that can cause elbow bursitis. [4]

Pathophysiology

Whether it is traumatic or the introduction of an infectious pathogen, the inciting event causes a reactive inflammation in the bursa. The inflammatory cascade causes the extravasations of protein and synovial type fluid into the bursa. The result is the marked round swelling and pain associated with this condition. [3]

The common symptoms of Olecranon Bursitis include
- Redness or warmth, tenderness and pain around the back of the elbow
- Swelling directly over the bony prominence of the tip of the elbow
- Limited range of motion of the elbow. [4]

Diagnosis

After clinical examination, laboratory tests are essential to differentiate septic from non-septic bursitis, so the aspirate should be sent for microscopy and culture. X-ray is recommended for a foreign body or a bone spur. [5]

Management of Olecranon Bursitis

- Oral NSAIDs such as ibuprofen, celecoxib, naproxen can help to reduce the pain
- Focal corticosteroid injection can be beneficial if there is no significant improvement with oral NSAIDs.
- Empiric antibiotic selection is based on the suspected source of the microorganisms.
- Patients who have often olecranon bursitis are recommending applying the RICE method of treatment. Rice stands for Rest, Ice, Compression and Elevation
- Physiotherapy treatment modalities that could be helpful for reducing pain and inflammation.
- Referral to an orthopedic surgeon is appropriate when surgical excision of the bursa or underlying bone spur is being considered. [6]
- If the bursitis is not from an infection, there are several management options.
- Elbow pads - An elbow pad may be used to protect your elbow
- Activity changes - Avoid activities that cause direct pressure to your swollen and infected elbow. [2]
- Recovery and Prevention
- Avoiding further trauma to the olecranon bursa is the key to recovery and prevention of recurrence
- A compressive elbow sleeve (eg, a neoprene or elastic sleeve) may help to prevent the bursal fluid from re-accumulating after aspiration, but the application of excessive pressure over the elbow should be avoided.
- Consider use of elbow pads to cushion the elbow. [6]

REFERENCES:

highly expressed in immune myeloid cells and was activated by resolvin D1 in immune cells in the spleen and in immune cells at the heart attack site. The result was an expedited resolution of the heart attack injury. Resolvin D1 is one of the omega 3 fatty-acid metabolites known as specialized pro-resolving mediators, or SPMs, that help clear inflammation.\[2\] Before the mice study, they examined heart muscle tissue from patients with heart failure. They found that ALX/FPR2 was plentiful in these human ischemic hearts, and it was located in the cytoplasm of the myocardial cells. In contrast, in healthy human heart tissue, ALX/FPR2 was limited to the cell membrane. After this, they expanded their study in mice having an ALX/FPR2 gene deletion.\[2\]

They found that mice lacking ALX/FPR2 showed spontaneous, age-related obesity. With the obesity, the ALX/FPR2-null mice developed heart disease that weakened the heart’s ability to pump blood, and they had a shortened lifespan with aging. The aging mice also developed kidney inflammation, as shown by increased inflammation markers like NGAL, TNF-alpha and CCL2, and elevated plasma creatinine levels.\[3\]

After a heart attack in normal mice, leukocyte immune cells in the spleen produce SPMs. However, in the ALX/FPR2-null mice, the researchers found lower levels of SPMs in the heart and the spleen after heart attack, indicative of non-resolving inflammation. This suggested that impaired cross-talk between the injured heart and splenic leukocytes, a cross-talk that is required for the resolution of inflammation. In addition to the lower levels of SPMs, the ALX/FPR2-null mice showed dysregulation of several immune responsive enzymes -- lower levels of LOX enzymes and increased levels of the pro-inflammatory COX-1 and COX-2 enzymes.\[3\]

Finally, the ALX/FPR2-null mice showed impairment of activated macrophage cells to phagocyte -- that is, to "eat" infecting microbes or dead human cells, one of the macrophage’s prime functions. After heart attack, the ALX/FPR2-null mice had increased numbers of neutrophils, the first phagocytic responders after heart injury, in both the spleen and the left ventricle of the heart. In addition, there were reduced numbers of reparative macrophages in both the spleen and the heart.\[2\] These findings demonstrated that integrative role of ALX/FPR2 as a primary target to manage cardiometabolic health, inflammation-resolution processes, and cardiorenal syndrome in aging.\[3\]

References:

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**CAN FOOD HELP IN REDUCING INFLAMMATION? YES, IT DOES**

Dr. Leena Pavitha, Assistant Professor

One of the best ways in reducing inflammation is based on the healthy foods that we consume on a daily basis. The anti-inflammatory diet can easily fight inflammation that affects the individuals.

Anti-inflammatory lifestyle includes:
1. Eating anti-inflammatory foods
2. Not smoking
3. Limiting alcohol intake
4. Adequate exercise and being active
5. Getting good quality sleep
6. Managing stress
7. Managing weight

The anti-inflammatory diet:

1. Eat more anti-inflammatory foods:
   - Eat a colorful well balanced diet with lots of vegetables and fruits.
   - Diets rich in fruits and vegetables supply important anti-inflammatory and phytochemicals that are powerful anti-inflammatory nutrients.
   - Anti-inflammatory properties can help to reduce inflammation.

2. Increase omega-3-fatty acids
   - Foods containing long-chain omega-3-fatty acids such as cold water fish (salmon, Sardines, and Tuna) are good at decreasing inflammation.

3. Increase olive oil
   - Use of extra-virgin oil is an excellent choice has been shown to lower blood pressure, LDL, cholesterol and markers of inflammation.

4. Increase tea and several spices
   - Spices like ginger and turmeric contain anti-inflammatory compounds. Green is a powerful anti-inflammatory.
   - Inflammatory foods to avoid
     1. Omit trans-fat containing foods
     2. Trans-fatty acids consumption promotes inflammation. Foods that contain trans-fat includes margarine, deep-fried foods, and processed foods.
     3. Reduce saturated fat intake
     4. Increases the levels of inflammation in overweight and obese individuals.

References:
HEADACHE DISORDERS

Dr. Shrilatha, Assistant Professor

Headache is a common symptom that one experiences at some period of time in their life. Large number of people overlook this symptom, hence only few are diagnosed and treated appropriately. [1, 2] The International Classification of headache disorders (ICHD) classifies headache disorders in to:

- **Primary Headaches:** Symptoms that occur due to over activity of pain sensitive structures in the head. They include:
  - Migraine
  - Tension type headache
  - Cluster headache

- **Secondary Headaches:** Symptoms that occur due to other serious medical conditions such as head trauma, head and neck infections, severe hypertension or any condition that affects the brain. They include:
  - Medication overuse headache or Rebound headache
  - Post-traumatic headache
  - Thunderclap headache [3]

**Migraine:**
It is the most common type of headache with moderate to severe pain intensity that often begins in childhood. It is characterized by throbbing pain, pulsing sensation, more often on one side of the head. Some people may experience a symptom known as aura which includes visual disturbances, tingling sensation in arm or leg and difficulty in speaking while others experience pain associated with nausea and vomiting. The attack lasts for about 72hrs. [4]

**Tension type headache:**
In this type of headache, the patient feels as if they have a tight band around the head. The pain is experienced on both sides of the head and may originate or radiate to the neck. The attack lasts for about few hours to several days. [5]

**Cluster headache:**
Headache occurs suddenly which lasts from 15mins to 3 hrs. The pain is one-sided, reoccurring and described as severe and mainly focuses around the eye, nose and may also radiate to other areas of the face. It is associated with excessive tearing, redness of the eye, running nose, drooping eyelids and pallor. [6]

**Medication overuse headache or Rebound headache:**
Rebound headache are mainly caused due to the long-term use of pain medications. It causes multiple symptoms which include neck pain, restlessness, nasal congestion, memory problems and irritability. It lasts until the medication is stopped.

**Post-traumatic headache:**
It usually develops within 7 days after a head injury and is characterized by vertigo, irritability, insomnia and lightheadedness. It resembles migraine and tension type headache. It lasts for 1-3 months.

**Thunderclap headache:**
It is caused due to hemorrhagic stroke, ischemic stroke, blood vessel damage, and head injury. It is also referred as “first worst headache of your life”. It has an abrupt onset and lasts for 5mins. It causes intense pain and it reaches its peak within a minute. [7]

**TREATMENT:**
- Non-pharmacological treatment:
  - Biofeedback and relaxation therapy
  - Cognitive behavioral therapy
- Pharmacological treatment:
  - Dihydroergotamines
  - Preventive treatment:
  - Antidepressants
  - Anticonvulsants
  - Corticosteroids
  - Beta blockers
  - Calcium channel blockers [8,9]

References:

white meat, eggs, and Fermented dairy products (cheese and yogurt), and relatively small amounts of sweets and red and processed meat. It is likely that the diet as a whole rather than individual components, leads to good results. The various components act together to reduce inflammation and produce favorable effects in the body.
DEPARTMENTAL ACTIVITIES


Pharm.D interns attended international seminar on “Recent Approaches in Learning Perspectives of Pharmacy Education”, organized by Faculty of Pharmacy, Sri Ramachandra University on 30.07.2019.

Pharm.D Interns provided channel pharmacy and patient counseling in Voluntary Health Services Hospital, Chennai on 11.10.2019.

Pharm.D Interns Keren Ann George and Joan Priscilla won first prize in the debate on “Advanced technology and application- boon or ban” organized by Rotary club of Adyar, on 13.10.2019 at Hotel Savera, Chennai.

Pharm.D third year students attended seminar on “Global Trends in Drug Design, Discovery and Pharmaceutical Sciences”, organized by School of Pharmacy, Vels Institute of Science and Technology on 23.07.2019.

Pharm.D interns actively participated in the multispecialty medical camp organized by Indian Red Cross Society, Tamil Nadu Branch on 27.09.2019.

Department faculty members attended International Conference on Bioethics and Health Sciences (Bioethicon 2019), organized by SRM Medical College on 08.11.2019 to 10.11.2019.
Dr. Krishna Kumar, Professor and Head delivered a guest lecture on "Schedule Drug Management for Hospital Pharmacists" in Pharmacy Academia Meeting at Apollo Hospital, Chennai sponsored by Pfizer Ltd.

Dr. Krishna Kumar, Professor and Head delivered a lecture on "Pharmacogenomics and Personalized Medicine" in Dayananda Sagar University, College of Pharmaceutical Sciences, Bengaluru on 20.11.2019.

Pharm.D interns participated in Diabetes awareness camp along with Dr. Saroja, Senior Consultant counseling in Voluntary Health Services Hospital, Chennai on 14.11.2019.

Pharm.D interns participated in Diabetes awareness camp along with Dr. Saroja, Senior Consultant counseling in Voluntary Health Services Hospital, Chennai on 14.11.2019.

Dr. Lochana, Clinical Pharmacist from Sankara Nethralaya Hospital delivered a guest lecture on "Clinical Pharmacist role in Management of Diabetes and its Complications" for Pharm.D students on 25.11. 2019.

Pharm.D interns participated in free medical awareness camp in Voluntary Health Services Hospital, Thoraipakkam Branch Chennai on 25.11.2019.

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