Drug & Poison Information Center—Faculty of Pharmacy—Tanta University

Drug & Poison Information Bulletin

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Inside this issue:

Coconut Oil & Alzheimer's disease

Alzheimer's disease (AD) is a progressive neurodegenerative disease that impairs memory, and other important mental functions. The pathophysiologic hallmarks of the disease are the gradual accumulation of neuritic plaques and neurofibrillary tangles.

The accumulation of both plaques and tangles result in a shortage of neurotransmitter acetylcholine; these changes occur in brain regions involved in learning, memory, and emotional behaviors.

Various studies have linked AD with other conditions modifiable by diet such as diabetes mellitus, hypertension and cardiovascular diseases. Recent literature has shown that coconut oil potentially have beneficial effects on mitigation of cognitive deficits of AD. These studies pointed to the significant positive effects of coconut oil on the lowering of plasma cholesterol, blood pressure which are risk factors associated with AD. Furthermore, coconut oil has been identified as a potential cognitive strengthener.

Coconut oil is principally composed of saturated fatty acids (SFA) (about 92 %), with 62–70% being medium-chain triacylglycerol (MCT), making coconut oil unique among dietary fats.

Medium chain triglyceride or medium chain fatty acids (MCFAs) can act as a non-carbohydrate fuel source by enhancing the formation of ketone bodies (KBs) in the body.

These KBs can cross the blood-brain barrier, and brain cells , and acts as the primary alternative fuel source during glucose deficiency (ketosis).

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ketone bodies are converted by the cells into acetyl-CoA that enters the citric acid cycle, producing ATP and precursors for acetylcholine production. In addition, brain cells utilize ketone bodies to synthesize long- chain fatty acids.

Glucose use is impaired in AD due to disruption of the insulin signaling mechanism. By providing an alternative fuel source to glucose, ketonic diet may be able to sustain neural viability. However, few other studies dispute these findings, as more research needed to investigate the role of ketone bodies in the treatment of AD.

A study published in 2017 pointed to the ability of coconut oil and MCFAs to increase the production of KBs in neurons and astrocytes. This increases available energy to these cells to overcome cell stress.

Oxidative stress is linked to the development of AD. Moreover, studies suggest that diets rich in antioxidants may be protective against AD. Coconut oil has a high percentage of polyphenols, which are recognized for their antioxidant properties such as *p-coumaric acid*, *ferulic acid, caffeic acid* and *catechin acid*. The hydroxyl group of the phenolic compounds may reduce the toxicity of Aβ peptide, ferulic acid might inhibit Aβ deposition in the brain, *p*-coumaric acid has strong antioxidant properties. Research has shown *p*-coumaric acid could reduce cognitive deficits in rat models and reduce apoptotic cell death in the hippocampus of rats infused with Aβ fibrils.

Major components of coconut oil, such as, fatty acids such as lauric acid and capric acid, as well as phenolic compounds such as ferulic acid and *p*-coumaric acid are believed to be involved in reducing insulin resistance, which is linked to AD.

In conclusion, the lipid content of coconut oil, largely MCFAs, via KBs, provide alternative pathway to glucose pathway. Although the research showed positive effects of KBs against AD, more research is needed. In addition, research demonstrated the positive effects of the polyphenols of coconut oil against AD; more studies are required to clarify their role.

References:

Fernando WM, Martins IJ, Goozee KG, *et al* (2015).The role of dietary coconut for the prevention and treatment of Alzheimer's disease: potential mechanisms of action. Br J Nutr; 114(1): 1-14.

Nafar F, Clarke JP, and Mearow KM (2017). Coconut oil protects cortical neurons from amyloid beta toxicity by enhancing signaling of cell survival pathways. Neurochem Int; 105:64-79.

Ehert MJ and Chamberlin KW (2016). Alzheimer Disease. In Pharmacotherapy Principles & Practice (Chisholm-Burns MA, Schwinghammer TL, Wells BG, *et al*). 4th Edn, McGraw-Hill Education, New York, NY , pp 451-461.

By: Amr Nowier, B. Pharm. & Mona El-Tamalawy, B. Pharm.

WHO Updates

Antibiotic resistance is one of the biggest threats to global health, food security, and development today. WHO published its first ever list of antibiotic-resistant "priority pathogens". The list was drawn up to guide and promote research and development (R&D) of new antibiotics.

WHO priority pathogens list for R&D of new antibiotics

Priority 1: CRITICAL

1. ***Acinetobacter baumannii*,** carbapenem-resistant.
2. ***Pseudomonas aeruginosa*,** carbapenem-resistant.
3. ***Enterobacteriaceae*,** carbapenem-resistant, Extended-Spectrum Beta-Lactamases (ESBL)-producing.

Priority 2: HIGH

1. ***Enterococcus faecium*,** vancomycin-resistant.
2. ***Staphylococcus aureus,*** methicillin-resistant, vancomycin-intermediate and resistant
3. ***Helicobacter pylori*,** clarithromycin-resistant.
4. ***Campylobacter* spp.,** fluoroquinolone-resistant.
5. ***Salmonellae*,** fluoroquinolone-resistant.
6. ***Neisseria gonorrhoeae*,** cephalosporin-resistant, fluoroquinolone-resistant.

Priority 3: MEDIUM

1. ***Streptococcus pneumoniae*,** penicillin-non-susceptible.
2. ***Haemophilus influenzae*,** ampicillin-resistant.
3. ***Shigella* spp.,** fluoroquinolone-resistant.

Source: http://www.who.int/mediacentre/news/releases/2017/bacteria-antibiotics-needed/en/

By: Bassant Maher, B. Pharm.

Safety Alerts

Chlorhexidine Safety Review (February 2017)

ISSUE: FDA is warning that rare but serious allergic reactions including anaphylaxis, itchy hives with swelling of the face, eyes, lips, mouth or throat, difficulty breathing, throat tightness or hoarseness, and fainting have been reported with the widely used skin antiseptic products containing chlorhexidine gluconate.

FDA is requesting the manufacturers of over-the-counter (OTC) antiseptic products containing chlorhexidine gluconate to add a warning about this risk to the Drug Facts labels. Prescription chlorhexidine gluconate mouthwashes and oral chips used for gum disease already contain a warning about the possibility of serious allergic reactions in their labels.

RECOMMENDATION:

* Health care professionals should always ask patients if they have ever had an allergic reaction to any antiseptic before recommending or prescribing a chlorhexidine gluconate product.
* Advise patients to seek immediate medical attention if they experience any symptoms of an allergic reaction when using the products.
* Consider using alternative antiseptics such as povidone-iodine, alcohols, benzalkonium chloride, benzethonium chloride, or parachlorometaxylenol (PCMX) when any previous allergy to chlorhexidine gluconate is documented or suspected.

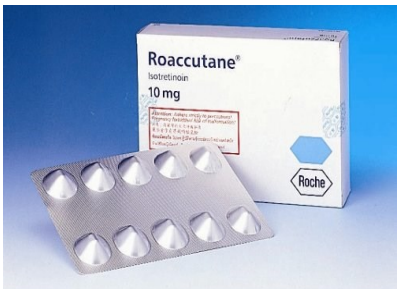
Further information can be found at:

1. ***http://www.fda.gov/Safety/MedWatch/SafetyInformation SafetyAlertsforHumanMedicalProducts/ucm539575.htm?source=govdelivery&utm_medium=email&utm_source=govdelivery.***
2. ***http://www.hc-sc.gc.ca/dhp-mps/medeff/reviews-examens/chlorhexidine-eng.php.***

By: Bassant Maher, B. Pharm.

What should you know about Isotretinoin and Pregnancy

Isotretinoin must not be used by women and adolescents who are pregnant or who may become pregnant. There is an extremely high risk that severe birth defects can result if pregnancy occurs while taking isotretinoin in any amount, even for short periods of time. ***Birth defects*** following isotretinoin exposure include; abnormalities of the face, eyes, ears, skull, CNS, cardiovascular system, thymus and parathyroid glands. Cases of intelligence quotient (IQ) scores less than 85 with or without other abnormalities have been reported. There is an increased risk of spontaneous abortion, and premature births have been reported. ***If pregnancy does occur during treatment*** **of** a female patient who is taking isotretinoin, isotretinoin must be discontinued immediately. Exposed woman should be referred to an obstetrician-gynecologist experienced in reproductive toxicity for further evaluation and counseling.



Canada has instituted a pregnancy prevention program, which requires:

1. Patient's written consent.
2. Two negative pregnancy tests before starting treatment.
3. Monthly tests during treatment and one month after stopping.
4. Use of two reliable birth control methods throughout this period.
5. If a patient becomes pregnant while taking isotretinoin, she should stop taking the drug immediately and consult her health care provider.

Further information may be found at:

1. ***http://online.lexi.com/lco/action/doc/retrieve/docid/multinat_f/4668733***
2. ***http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2016/60096a-eng.php.***

By: Bassant Maher, B. Pharm.

Refresh Your Knowledge

Major Drug Interactions Every Pharmacist Should Know

ACE inhibitors + Potassium supplement

Impact: Potential for elevated serum potassium levels. The risk is likely greater in patients with additional risk factors for the development of hyperkalemia (e.g., renal insufficiency, use of potassium-sparing diuretics).

Mechanism of Interaction: Inhibition of ACE results in decreased aldosterone production and potentially decreased potassium excretion.

Monitoring/Precautions: Potassium levels greater than 5 mEq/L should be monitored carefully due to risk of severe hyperkalemia. Watch renal function as blood urea nitrogen (BUN) and serum creatinine (SCr). Adjust potassium supplementation if levels increase.

Source:

- ***http://online.lexi.com/lco/action/interact***
- ***http://emedicine.medscape.com/article/240903-overview***

ACE inhibitors + Spironolactone

Impact: Increase the risk of hyperkalemia.

Mechanism of Interaction: Inhibition of ACE results in decreased aldosterone secretion, which can lead to increases in serum potassium, that may be additive with that induced by potassium-sparing diuretics**.**

Monitoring/Precautions: Monitor for increased incidence of hyperkalemia if potassium-sparing diuretics, and angiotensin-converting enzyme inhibitors are used concomitantly.

Source:https://www.drugs.com/interactions-check.php?drug_list=493-0,2105-0

Amiodarone + Digoxin

Impact: Concurrent use of Amiodarone and Digoxin may result in digoxin toxicity (nausea, vomiting, and cardiac arrhythmias).

Mechanism of Interaction: Inhibition of p-glycoprotein by Amiodarone, and reduction of Digoxin clearance

Monitoring/Precautions: Measure Digoxin concentrations prior to initiation of concurrent use. Reduce the oral digoxin dose by approximately 30% to 50% (or the IV or IM digoxin dose by approximately 15% to 30%, or modify the dosing frequency. Continue monitoring Digoxin plasma concentration levels.

Source:http://www.micromedexsolutions.com/micromedex2/librarian PFDefaultActionId/evidencexpert.ShowDrugInteractionsResults

Warfarin + Clarithromycin

Impact: Concurrent use of Clarithromycin and Warfarin may result in an increased risk of bleeding.

Mechanism of Interaction: Disruption of vitamin K synthesis

Monitoring/Precautions: When possible, substitute clarithromycin with an antibiotic with a low-risk profile for bleeding, such as clindamycin or cephalexin . If concomitant use of clarithromycin and warfarin is required, early and more frequent monitoring of the patient's INR is recommended, especially during initiation and discontinuation of clarithromycin

Source:http://www.micromedexsolutions.com/micromedex2/librarian/ PFDefaultActionId/evidencexpert.ShowDrugInteractionsResults

To be continued in the next issue…

By: Nagwan Salama, B. Pharm.

Egypt Upcoming Conferences

1- **1st International Conference on Global Research Challenges in Medical & Medicine Studies (GRCMMS-May-2017):** 06-07 May 2017, Cairo, Egypt.

2- **Egyptian Congress of Pediatric Pulmonology (ECPP):** 16-19 May 2017, Alexandria, Egypt.

3-**Imperial College Diabetes Centre - Advanced Diabetes Conference Abu Dhabi 2017:** 19-20 May 2017, Abu Dhabi , United Arab Emirates.

4- **Cardio Alex 2017:** 23-26 May 2017, Alexandria, Egypt.

5- **8th Arab Diabetes Forum (ADF):** 27-29 Sep 2017, Cairo, Egypt.

6- **Gulf Regional Congress on Obesity 2017:** 28-30 September 2017, Abu Dhabi, United Arab Emirates.

7- **IDF World Diabetes Congress 2017:** 4-8 December 2017, Abu Dhabi, United Arab Emirates.

8- **8th International Scientific Conference of Faculty of Pharmacy, Cairo University:** 22 April 2017, Cairo, Egypt.

By: Nagwan Salama, B. Pharm. & Mai Mousa, Pharm D.

Editorial Board

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