

MedNut Mail

The How, When, Where, Which and Why of pharmacotnutrition

Guest case study –

An innocuous combination of prescribed medications

Y Coleman

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<https://medicationsandnutrition.online>

Commentary

A reader sent in this list of prescribed medicines and did not provide any other information.

Drug	Vits + Mins	bpp >90%	N/V	C/D	Wt	App	Tst	Thir	Sal	Drlg	d m	Dys	BSL
Allopurinol		<input type="checkbox"/>	NV	D			<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Furosemide	Ca, Cl, K, Mg, Na, Zn	<input checked="" type="checkbox"/>	NV	CD		↓	<input type="checkbox"/>				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Gemfibrozil		<input checked="" type="checkbox"/>	NV	CD	↓	↓	<input checked="" type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Metoprolol		<input type="checkbox"/>	NV	CD	↑		<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Zinc sulfate	Cu	<input type="checkbox"/>	NV	D			<input type="checkbox"/>				<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input checked="" type="checkbox"/>					<input checked="" type="checkbox"/>				<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Extra drug:

Drug-food interactions

Allopurinol

High intake of salicylates is likely to decrease therapeutic benefit.

Interacts with caffeine to enhance drug effect.

May interact with theophylline to increase duration and extent of theophylline effect; food sources of theophylline include tea.

Furosemide/Furosemide

Drug may lower threshold for salicylate toxicity – proposed mechanism competitive renal excretion.

Theophylline may increase the effects of curare-type muscle relaxants.

Orange juice can reduce drug absorption.

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Drug-nutrient interactions

Allopurinol

Drug is a substrate for some of the renal transporters - which means the drug competes for uptake with vitamin C, pyridoxine, folate, carnitine and citrulline.

Furosemide/Frusemide

Drug is both a substrate and inhibitor of some of the renal transporters -

- substrate - which means the drug competes for uptake with pyridoxine, folate and citrulline,
- inhibitor - which means the drug inhibits the renal uptake of riboflavin and folate.

Drug directly increases excretion of potassium, magnesium, zinc, calcium, sodium and thiamine, and also indirectly decreases thiamine availability via reduction in magnesium absorption and renal reabsorption (magnesium is necessary for thiamine activation).

Metoprolol

Inhibits renal uptake of choline, histamine, creatinine and thiamine.

Zinc sulfate

Both zinc and copper share the same absorption mechanism therefore longterm administration of zinc may increase risk of copper deficiency.

My response to the request.

The plasma proteins are the primary transporters for 3 of the prescribed medications, being frusemide, gemfibrozil and metoprolol, and hypoproteinaemia may alter their effects therefore advisable to clarify plasma protein status.

Four of the prescribed medications, being allopurinol, frusemide, gemfibrozil and metoprolol, alter glycaemic status therefore advisable to monitor glycaemia on a regular basis such as HbA1cs every 3 months.

Given the negative impacts of some of the prescribed medications on nutrient status advisable to clarify the status of copper, magnesium, potassium, sodium, zinc, and thiamine. If these prescribed medications continue to be required then advisable to monitor these nutrients on a regular basis such as annually.

The side effects of three of the prescribed medications, being apixaban, frusemide and gemfibrozil, include loss of appetite therefore advisable to monitor for weight loss at regular intervals such as weekly. Non-volitional weight loss is unacceptable in everyone and especially in the elderly therefore, if there is weight loss then the advisable first line of intervention would be to review dose and necessity of the prescribed medications – are they still required? and can their doses be reduced? If the

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answers to these questions are Yes and No, only then should alternative interventions be considered.

Both salicylates and theophylline alter the effectiveness of allopurinol and frusemide therefore advisable to recommend a consistent dietary intake of these foodstuffs.

Inhibition of renal transporters means the impacted nutrients remain in the bloodstream for a longer duration – apart from B6 being associated with peripheral neuropathy, we don't know the consequences of sustained elevated nutrients. It also means we need to be more careful in our interpretation of pathology results and not just assume elevated or high-normal levels are due to excessive ingestion.

What interventions will you initiate –

- recommend monitoring blood levels of each of the impacted nutrients on a regular basis?
- consider renal inhibition if nutrient levels are elevated or high-normal?
- ensure zinc interventions have stop dates when commenced ie the cessation date is clear?
- monitor copper levels whilst zinc interventions are prescribed?
- ensure frusemide is not administered with orange juice?

Conclusions

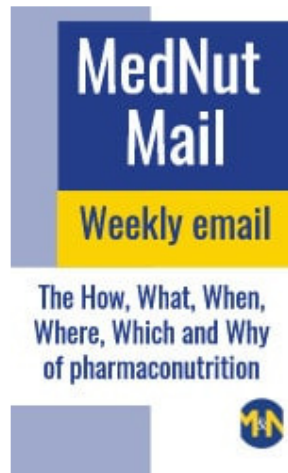
Whilst seemingly innocuous this combination of prescribed medications has potentially significant drug-food and drug-nutrient interactions that require ongoing monitoring.

What else would you include?

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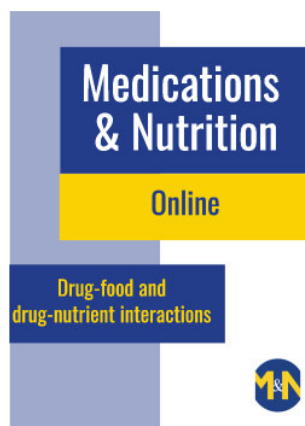
Medications have profoundly and positively changed health outcomes however they do generally come with some nutritional harms. By identifying and addressing the nutritional harms, optimal health outcomes are closer to being achieved.

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