MedNut Mail

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

Medication Advisory Committees and pharmaconutrition

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https://medicationsandnutrition.online

Commentary

The APAC Guidelines (Australian Pharmaceutical Advisory Committee) were established by the three key peak bodies (doctors, nurses and pharmacists) involved with drug management in residential care facilities. Is there a role for nutrition?

Medication Advisory Committee's (MAC's) are an ideal forum for addressing a range of issues that have a medication:nutrition interface. MAC's activities include:

- addressing immediate administration issues that may compromise the care of the resident,
- the development of policies and procedures to improve drug management issues, and
- education of Committee members and facility staff.

Drugs can affect nutritional status, and nutritional status can alter the effects of drugs. Three issues that can be addressed by the MAC's are outlined below.

1. Recent changes in diet

Health education messages promote a variety of changes to our diet. For people on long term drug therapy, sudden dietary changes may be detrimental.

Drug doses are stabilised on habit, and change in domicile from home to residential care significantly changes many habits, especially food-related habits.

Typical food habits that are changed include:

- the time the meal is eaten,
- whether the main meal is served at midday or in the evening,
- the actual foods offered,
- the style of the meals eg typically British or with a multicultural influence,
- how the food is cooked eg with or without salt, and whether the salt is iodised,
- changes to actual food choices eg coffee with or without caffeine.

The MAC may decide to include some questions at admission with regard to caffeine use and grapefruit use because of their associations with drug effect; it may also develop some protocols to establish whether some of the settling in behaviours of new residents may also be a consequence of altered drug effects due to significant changes in dietary habit.

2. Sugar content of drugs

Does the small amount of sugar in prescribed medicines really upset BSL's

either individually or in a polypharmaceutical scenario? Has the impact ever been measured?

If the prescribed medicines are administered at mealtimes then there is likely to be limited impact on BSLs from the small amount of sugar present.

What is the impact on BSLs when sugar-containing prescribed medicines are administered an hour prior to meals?

The MAC may trial monitoring the effects of lactose-containing drugs on the BSL's of people with diabetes. On the basis of their findings they may then develop a policy with regard to the use of "sugar-free" preparations.

3. Vitamin K and Warfarin

Vitamin K is well-known for its antagonistic effect with warfarin. Vitamin K has a range of functions associated with bone health, neurological physiology, and is necessary in the intracellular response to insulin and via this mechanism has systemic effects; consequently a regular, stable vitamin K intake is recommended when warfarin is prescribed.

The vitamin K content in Australian foods is not known, however there is easy access to the American database. There is an assumption that vitamin K content of Australian foods is similar to that of American foods.

The second-generation anticoagulants do not require dietary restrictions. Given the increased risk of falls and consequent internal bleeding for those prescribed warfarin and reside in residential care, and the long waits for an X-Ray at many Emergency departments, there is an increasing preference for non-warfarin alternatives to be prescribed where possible.

The MAC may

- audit the number of people in their care requiring warfarin/anticoagulation management,
- identify those who can be managed with second-generation anticoagulants,
- create a menu that provides a relatively consistent intake of vitamin K for those requiring long term warfarin therapy.

Conclusion

The medication:nutrition interface is multifaceted and contains many relevant issues for MAC consideration therefore nutrition representation is important.

Case study

Medical History with Nutritional Aspect

Amputation	☐	Constipation	☐	Dysphagia	☐	MND	☐
Anaemia	☐	CVA	☐	Enteral Feed	☐	MS	☐
Arthritis	☑	CVD	☐	Falls	☐	Osteoporosis	☐
Cancer	☑	Dementia	☐	Fracture	☐	PD	☐
CCF	☐	Dentures	☐	Frailty	☐	Pressure Area	☐
Chest Infection	☐	Depression	☐	Gout	☐	Renal	☑
COAD	☐	DM Type 1	☐	Hypertension	☑	Ulcer	☐
Confusion	☐	DM Type 2	☑	Incontinent	☐	UTI	☐

Food Allergies: vit D def, PMR, hypercholesterolaemia

Other: hyperthyroidism (amiodarone-induced), Ca SCC, AF

Biochemistry with Pharmaconutritional Consequences

Na:	137	mmol/l	Hb:	172	g/L	Albumin:	38	g/L	BSL:		mmol/l
K:	4.4	mmol/l	Lymph:	2.6		Total Protein:	71	g/L	HbA1C:	8.2	
Urea:	5.3	mmol/l	MCV:	87	mmol/l	B12:		pmol/L	INR:		
Creatinine:	0.069	mmol/l	Zn:		umol/l	Folate:		nmol/L	TSH:	2.63	mIU/L

Other: eGFR 69, chol 6.8, Tg 3.6, HDL 1.1, LDL 4.1, chol:HDL 6.2, LDL:HDL 3.7, U alb:creat 8.9, T4 18.0, T3 4.3, vit D 53

Medications That May Adversely Affect Nutritional Status

Drug	Vits + Mins	bpp >90%	N/V	C/D	Wt	App	Tst	Thir	Sal	Drlg	d m	Dys	BSL
Calcium carbonate	(600 mg/day) Fe	☐		C			☐				☐	☐	☐
Cholecalciferol	(1000 IU/day)	☐					☐				☐	☐	☐
COLOXYL WITH S		☐		D			☐				☐	☐	☐
Dabigatran		☐					☐				☐	☐	☐
Diltiazem	(CD), B2	☐	NV	CD	↑	↓	☑	↓			☑	☐	☑
Gliclazide	(08:30) MR	☑	NV	CD	↑	↕	☑				☐	☐	☑
Irbesartan	B2, Zn	☑	NV	CD	↑	↕	☑				☑	☑	☐
JANUVIA	(08:30)	☐	NV	D			☐				☐	☐	☐
SIGMAXIN	(125 mcg/day) Mg	☐	NV	D		↓	☐				☐	☐	☐

Extra drug: Xigduo XR (08:30), mirabegron

Comments – medication and nutrition impacts (direct and indirect) only

Recent relevant biochemistry does not appear to be impacted by prescribed medicines.

Diabetes drugs

- xigduo XR - contains metformin
- gliclazide MR has a duration of about 24 hours
- januvia has a duration of > 24 hours

Diabetes drugs coverage

- before breakfast BSLs - minimal, if any, coverage from previous morning's januvia, xigduo or gliclazide MR;
- before midday meal - covered by current morning's januvia, xigduo and gliclazide MR;
- before evening meal BSLs - covered by current morning's januvia, xigduo and gliclazide MR.

Calci-tab provides 600 mg elemental calcium per tab; women require 1200-1500 mg elemental calcium/day therefore advisable to review current calcium management strategy.

Chronic use of coloxyl + senna may promote excessive loss of water and electrolytes, especially potassium, and their regular monitoring recommended.

A cross-sectional study found that those prescribed gliclazide (combination metformin + sulfonylurea) had significantly lower B12 levels than those prescribed combination metformin + insulin, and that the lowest B12 levels were associated with the highest sulfonylurea dose; proposed mechanism of action - sulfonylureas may affect intestinal absorption of vitamin B12, or its metabolism. As gliclazide has been prescribed since September 2019, and likely before then, advisable to check B12 status.

Metformin component of xigduo is associated with decreased B12 absorption - has been prescribed since September 2019 therefore advisable to check B12 levels.

Sigmaxin increases urinary excretion of magnesium; magnesium is important in activation of vitamin D, thiamine and iodine therefore advisable to check magnesium levels and ensure > 0.8 units.

At increased risk of thiamine and choline deficiencies as diltiazem, januvia, and metformin inhibit, and diltiazem and metformin are also substrates for their physiological transporters, therefore interventions recommended, and advisable to administer either one hour before or 2 hours after their (drugs) administration.

Staff advise Mrs AAE eats well, and is not observed to be grazing between meals.

Mrs AAE told me she does not have the sweats and shakes - and I particularly asked about the afternoon which she also denied.

Mrs AAE's diabetes management includes 3 drugs administered before breakfast, of which 2 drugs have durations of about 24 hours and 1 drug has a duration > 24 hour, it is likely there is minimal impact on next-day's before breakfast glycaemia. Realistically Mrs AAE should have very low BSLs because all 3 prescribed diabetes drugs administered before breakfast are maximally effective in the afternoons, however her afternoon glycaemia is not being monitored. Advisable to check afternoon glycaemia for 3 consecutive days and clarify current status - if they are mostly high then one should ask why and there seem to be 3 options:

1. the hyperglycaemic effects of the afternoon tea snack food, caffeine, and chlorogenic acid in the caffeine are sufficient to offset the hypoglycaemic effects of the drugs;
2. current medication management strategy is undermedicating glycaemic control;
3. current medication management strategy is overmedicating glycaemic control and causing the liver to release stored glucose as a physiological response to hypoglycaemia.

Advisable to check afternoon glycaemia on a regular basis.

Mrs AAE is at high risk of iatrogenic B12 deficiency therefore advisable to monitor B12 status on a regular basis ie at least annually.

What else would you include?

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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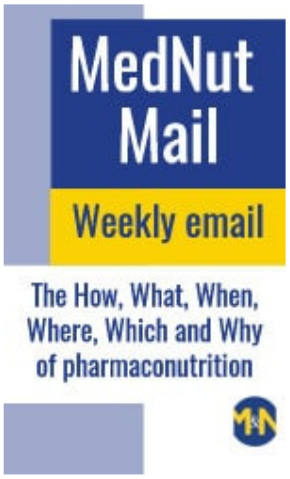

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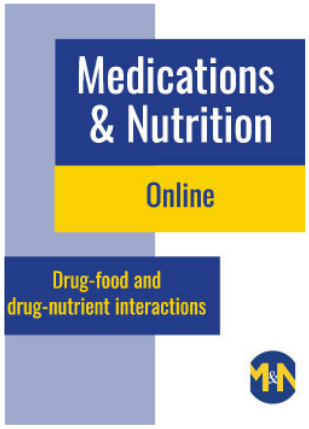

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