

**The impact of supplementation on nutritional adequacy of patients following
the Royal Prince Alfred Hospital elimination diet**

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The research presented in this report was conducted by the candidate under the guidance of the supervisors above. I Stephanie Pallas (the candidate) contributed to the development of recruitment and data collection protocols. I also collected and entered data with assistance from Lisa Andersson; and independently undertook data analysis.

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Declaration

1. I, ***Stephanie Pallas***, hereby declare that no work presented in this report has been submitted to any other University or Institution for a higher degree and that to the best of my knowledge contains no materials written or published by another person, except where due reference is made in text.
2. The studies described in this report were approved by the Ethics Review Committee (RPAH Zone) of the Sydney Local Health District, and all subjects gave informed consent before participating.

Signature

Dated on 5th June, 2015

The impact of supplementation on the Royal Prince Alfred Hospital elimination diet on nutritional adequacy

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Contributions:

Stephanie Pallas was the primary author involved in data collection, entry and analysis, and writing the manuscript. Lisa Andersson contributed to data collection and data entry. Dr Robert Loblay, Dr Velencia Soutter, Dr Anne Swain, Brooke McKinnon, Carling Chan, Kirsty Le Ray, Neelam Pun Amy Wu and Rajshri Roy were responsible for the study design, recruitment and supervision.

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Abstract

Aim : To assess patients' food and nutrient intake before and on Royal Prince Alfred Hospital (RPAH) elimination diet, with and without supplementation compared to the Nutrient Reference Values.

Method: Prospective patients were contacted a week prior to their RPAH allergy unit appointment. Patients who were prescribed the elimination diet were asked to fill in a patient information form, psychological questionnaires and a four day Weighed Food Record (WFR) at baseline and three weeks into the RPAH elimination diet. All data was analysed using Foodworks and Microsoft Excel and compared to the Nutrient Reference Values. Patients were categorized according to elimination diet (strict, moderate approach), wheat and/or dairy restrictions and supplement use.

Results: Thirty-two patients baseline and on elimination diet four day WFRs were analysed. The proportion of patients consuming within Acceptable Macronutrient Distribution Range for carbohydrate increased from 40%-69% and fat increased from 50% to 72%.

Supplementation made no difference to folate intake at baseline, but on elimination diet 90% of patients taking a folate supplement met the Estimated Average Requirement compared to 9% without supplements. Patients on the moderate approach met their vitamin A requirements without supplements, but only a third on the strict elimination diet patients met their vitamin A requirements without supplementation. All patients calcium intake was low at baseline. On the elimination diet calcium supplementation is required particularly with those patients restricting their dairy intake.

Conclusion: Nutrients most at risk on the elimination diet include calcium, vitamin A and folate. Detailed advice regarding suitable food sources, substitutions and supplementation

of these nutrients is an essential part of educating patients regarding the elimination diet and challenge protocol.

Keywords: elimination diet, supplementation, food intolerance, RPAH elimination diet, food restriction

Introduction

Food intolerances are non-immunological reactions to food.(1,2) Symptoms vary from person to person and can affect multiple body systems including the skin (e.g. eczema and hives), respiratory (e.g. asthma and nose and sinus), gastro intestinal (e.g. irritable bowel syndrome (IBS), reflux and mouth ulcers) and nervous system (e.g. headaches and mood swings).(1,3)

Food chemicals that individuals can be intolerant to can be naturally occurring (e.g. salicylates, biogenic amines and glutamates), added in food production (e.g. preservatives, flavours and colours) or include foods such as milk, soy and wheat.(2,4) Food intolerances can be difficult to diagnose, as skin and blood tests are unreliable, and a reaction may not occur immediately after food is ingested.(5) These reactions are dose dependent, where a small amount of a chemical may not cause symptoms if it does not exceed the individual dose threshold.(4)

The first elimination diet was developed in 1926-1928 by Albert H. Rowe to identify patients food intolerances.(6) The Royal Prince Alfred Hospital (RPAH) allergy unit developed an elimination diet in the 1980's based on Rowe's diet and avoided foods that contain significant amounts of the food chemicals salicylates, glutamates and amines as well as artificial colours and preservatives.(6) More recently the RPAH elimination diet has been developed to include different levels of dietary restriction ('strict', 'moderate approach' and 'simple').(4) The 'strict' elimination diet is for patients with severe and/or frequent symptoms; this level only allows patients to eat foods low in naturally occurring chemicals

and additives. The 'moderate' diet contains low and moderate chemical foods and is for those with less severe symptoms and for patients who find the strict diet too difficult to manage. The 'simple' diet is for those with mild symptoms, where patients only avoid very high chemical foods.(4) Patients may also need to avoid wheat and/or dairy if they have gastrointestinal symptoms. After at least two weeks on the elimination diet with five consecutive symptom free days, the patient is ready to begin challenges to identify food triggers. Challenges are completed with double blind placebo controlled purified food chemicals in capsule form and/or with foods grouped according to chemical content. Then an individualised diet is prescribed based on their challenge results and patients are encouraged to liberalise their diet as tolerated.

Food intolerance symptoms can be distressing to patients and interfere with everyday tasks.

(2) A study by Monsbakken, Vandvik & Farup, 2006 found that 62% of patients with IBS, self-restricted foods from their diet because they believed some foods exacerbated symptoms.(7) Ten (12%) patients had inadequate diets of which, seven patients were judged to be at risk of various vitamin and mineral deficiencies, particularly calcium, two patients avoided fat and three consumed inadequate energy with associated weight loss.(7) It has also been found that patients who use dietary supplements have a higher intake of nutrient-dense foods compared to patients who do not use supplements.(8)

Research looking into the nutritional adequacy of patients on their regular baseline diet and on the RPAH elimination diet (strict, moderate approach) found that their nutrient intake improved on the elimination diet (Hooper, 2014). However the impact of supplementation on nutritional adequacy was not investigated therefore this study aims to assess patients'

food and nutrient intake on their baseline and on the elimination diet, with and without supplementation, and results will be compared to the Nutrient Reference Values (NRVs), and the Estimated Energy Requirements (EER). (9,10) This in turn will be used to determine what advice should be given about supplementation for nutritional adequacy of patients on the elimination diet.

Method

This project is part of an ongoing prospective, observational study. Ethics approval was obtained from the Sydney Local Health District Human Research Ethics Committee (RPAH ZONE) protocol number X13-0208.

Subjects and Recruitment

Between March 2014 and April 2015, prospective patients aged 18 years or older were telephoned, one week prior to their booked appointment at the RPAH allergy unit. Patients were informed about the study and asked questions to determine suitability and interest in participation. Inclusion and exclusion criteria are included in Appendix I. Patients who agreed to participate were sent an information pack, a four-day weighed food record (WFR) with instructions by email or post. Involvement in the study was voluntary and participants could discontinue at any stage.

Eligibility

Patients who were prescribed the elimination diet by their doctor at their initial appointment were eligible to continue with the study. Patients, who had previously been on

the elimination diet or were not prescribed the elimination diet by the doctor, were ineligible. Participants had their height and weight measured using a stadiometer and electronic scales respectively. They received a clinical information form and study psychological forms to complete at the initial appointment. Completing the forms constituted implied consent for the study.

Four-day WFR

Patients brought their completed WFR to the initial consultation. The baseline WFR was completed using an iOS device, through the application Easy Diet Dairy (Xyris software, Brisbane, Australia) or by hard copy. Patients were instructed to specify food brands eaten and to weigh everything they consumed in the four days, including one weekend day. If this was not possible, they were asked to estimate using household measurements (e.g. cups, tablespoons, pinch). At the initial appointment, details of the patients WFR were clarified and they were requested to complete a second WFR three weeks into the elimination diet, this was their on elimination diet WFR.

Analysis

All WFRs were analysed using nutrition analysis software; Foodworks (Version 7, Xyris software) using the AUSNUT 2007, NUTTAB 2010, AUSFOODS 2012 and AUSBRANDS 2012 databases. Nutritional information including dietary energy, macronutrient and micronutrient intake of each patient was calculated. This data was then exported to Microsoft Excel (2007) and PRISM for descriptive analysis. Patients were categorised according to elimination diet type (strict elimination diet and moderate approach), wheat and dairy consumption and supplement use (vitamins and minerals).

Patient's nutrient and energy intakes were compared to the NRVs comprising of the Acceptable Macronutrient Distribution Range (AMDR) and Estimated Average Requirements (EAR) and the EER. Estimated Energy Requirements were calculated using Schofield's equation. (11) Goldberg's cut off was applied when Estimated Energy Intake (EEI) was less than 90% Basal Metabolic Rate (BMR) and was used to identify patients who were underreporting their dietary intake in their WFR's.(12)

Results

A total of 1335 prospective patients were contacted via telephone; 454 patients were willing to participate in the study and 881 declined or were uncontactable. At the initial consult, 185 of these patients were prescribed the elimination diet. Forty-three of these patients completed both baseline WFR and on the elimination diet WFR. Using Goldberg's cut off, eleven patients were excluded from the study due to under reporting on their WFRs. One patient was excluded as both baseline WFR and elimination diet WFR were below Goldberg's cut off. Five patients were excluded based on baseline WFR and five were excluded based on elimination diet WFR being under Goldberg's cut off. Overall 32 patients baseline WFRs and on the elimination diet WFRs were included in the study.

Demographic information

The mean age for participants was 42 years old with 27 females and five males. The Body Mass Index (BMI) range for women was 18.2-28.1 with a mean BMI of 21.8. The BMI range for men was 21.2-37.1 with a mean BMI of 25.7.

Elimination diet prescription and supplementation

Of the 32 study patients, 27 patients were consuming wheat at baseline compared to 10 patients on the elimination diet. Twenty-six patients were consuming dairy at baseline compared with nine when on the elimination diet. Ten patients consumed nutritional supplements at baseline including fish oil, calcium, multivitamins, herbal, fibre, zinc, eye health multivitamin, stress multivitamin, retinol, magnesium and vitamin C and D. On the elimination diet 17 patients consumed supplements including multivitamin, calcium, vitamin D, fibre, zinc and magnesium as suggested in the 'RPAH elimination diet handbook'. (4) Seven patients were instructed the moderate approach and 25 on strict elimination diet.

Nutrition Intake

Energy

Most patients on their baseline diet and on the elimination diet were consuming energy less than their EER. Only nine patients' baseline WFR and six patients on elimination diet WFR met their EER (Figure 1a). Nine patients reported that they were trying to lose weight prior to their appointment at the allergy unit.

Macronutrient

Most patients met their NRV requirements for fat and protein at baseline and on the elimination diet (Figure 1b and 1c).(10) The proportion of patients consuming within the AMDR for protein was similar on their baseline and on elimination diet WFR. The proportion of patients consuming within the AMDR for fat increased from 50% at baseline to 72% on the elimination diet. On the elimination diet less people were over consuming fat compared

to baseline (47% to 19%). The proportion of patients consuming within the AMDR for carbohydrate increased from 40% at baseline to 69% on the elimination diet (Figure 1d). On the elimination diet fewer patients were under consuming carbohydrates compared to baseline (63%-31%). No patient exceeded the AMDR upper limit for carbohydrate at baseline or on elimination diet.

Micronutrients

The micronutrient intake of all patients at baseline and on the elimination diet are detailed in Figure 2 and show that the majority of patients met the EAR for iron, zinc, magnesium, vitamin C, niacin, riboflavin and thiamin. However all patients had low intakes of calcium at baseline and their intake improved on the elimination diet with supplementation. The average dietary intake of vitamin A and folate met the EAR for those on the moderate approach but was low for those on the strict elimination diet without supplementation.

Calcium

Patients' diets with and without calcium supplements were compared at baseline and on the elimination diet and are outlined in Table 1. At baseline 10 patients (35%) taking no calcium supplement met the EAR and 1 patient (33%) with a calcium supplement met the EAR. The average intake of patients taking a calcium supplement was 1082mg. All patients who met the EAR for calcium at baseline were having dairy in their diet. On the elimination diet only 5 patients (28%) without calcium supplements met the EAR whereas 10 patients (71%) taking a calcium supplements met the EAR. Most of the patients on the elimination diet who met the EAR for calcium were not consuming dairy but were taking calcium supplements.

Folate

Patients' folate consumption at baseline and on elimination diet with and without supplementation is outlined in Table 2. At baseline 12 (41%) patients met the EAR for folate without supplements and all patients taking folate supplements at baseline met the EAR from food consumption alone. On elimination diet only two (9%) patients met the EAR for folate without supplements compared to nine (90%) patients that took a folate supplement.

Vitamin A

Patients vitamin A consumption at baseline and on the strict elimination diet or moderate approach, with and without supplements were compared in Table 3. At baseline 13 patients (52%) met the EAR for vitamin A without supplements and all patients that had a vitamin A specific supplement met the EAR. All patients on the moderate approach met the EAR without supplements. Nine (36%) patients on the strict elimination diet met the EAR without supplements compared to five (83%) who took a vitamin A supplement.

Discussion

This study shows that elimination diet prescription type (strict or moderate approach) and the use of nutritional supplements have an effect on the nutritional adequacy of patients following the elimination diet. Although the elimination diet is only used short term as a diagnostic tool for food intolerances, some patients may take some time to identify their food triggers and find a point of liberalisation. Therefore ensuring nutritional adequacy whilst on the elimination diet is a priority.

Patients protein intake did not change significantly between baseline and on the elimination diet. Patients intake of fat and carbohydrate improved on the elimination diet, showing an overall positive effect on patients AMDR. This positive change to the study groups AMDR occurs without an increase to patient's energy consumption when on the elimination diet. Study patients energy consumption decreased on the elimination diet. At baseline nine patients were consuming less than their EER, whereas on the elimination diet WFR six were meeting EER. Some patients also present to the allergy unit already self restricting foods (such as wheat and dairy) and this may be a factor in their AMDR not meeting recommendations on the baseline diet prior to presenting to the allergy unit. The elimination diet, it highly restrictive on food choices. Many patients may not like all the food on the diet that can make high-energy foods more difficult for patients to consume. Most patients intake of core foods increased and discretionary and processed foods decreased on the elimination diet. The linked choice of discretionary foods and the dietary advice patients receive when presented the elimination diet by the dietitians could be one factor leading to these improvements

The micronutrient intake of all patients baseline and on the elimination diet WRF reveals that the majority of patients met the EAR for iron, zinc, magnesium, vitamin C, niacin, riboflavin and thiamin. At baseline calcium intake in majority of participants was inadequate, and folate for a few patients was also inadequate. On the moderate approach majority of patients met all the nutrients EAR through diet alone except for calcium. On the strict elimination diet calcium, vitamin A and folate were all inadequate through diet alone,

but were adequate with vitamin/mineral specific supplementation. The strict elimination diet has limited food options, especially for patients that are also advised to restrict wheat and dairy. Appropriate food alternatives and supplementation is required to ensure nutritional adequacy of all vitamins and minerals.

Dairy and calcium specific supplements have a big part to play in nutritional adequacy of calcium. Calcium was below the EAR on baseline as well as on the elimination diet. Even with calcium supplements many patients were still under the EAR. This is similar to the NNS results, which indicate that calcium is the micronutrient Australians are generally not consuming adequately. (13) At baseline excluding dairy and including supplements does not have a large effect on calcium intake, whereas it does on the elimination diet. This showed that education on dairy alternatives, calcium-fortified foods and supplementation was effective in improve patients calcium intake on the elimination diet. However, even with a calcium supplement, 29% of the patients did not meet their calcium requirements on the elimination diet. The increased in calcium requirements for menopausal women contributed to this result. Further education of menopausal women and their increased calcium requirements need to be addressed at their initial consultation. Calcium intake could be improved by either recommending a higher amount of dairy alternatives and calcium-fortified foods or a higher dose supplement.

Many folate rich foods are restricted on the RPAH elimination diet and this can limit the patients' potential to meet their requirements through food alone. Ensuring patients

consume adequate folate intake is important. Education regarding food sources of folate (brussel sprouts, lettuce, cabbage, lentils, legumes and wholegrain/fortified cereals) is recommended. IF these food choices are limited ensuring patients take a folate supplement is vital, especially for pregnant women or women trying to conceive as they have increased requirements.

The strict elimination diet restricts commonly eaten foods that are high sources of vitamin A and its precursor β -carotene that has a large effect on vitamin A consumption. The moderate approach includes foods that have a significant source of vitamin A and β -carotene. The moderate approach allows three to four serves of vegetables high in vitamin A (such as carrot, pumpkin and sweet potato) so this gives more opportunities to for patient to meet the EAR. All patients on the moderate approach met the EAR for vitamin A without supplements whereas only a third of patients on the strict elimination diet managed to do this. Patients on the strict elimination diet require education on food sources of β -carotene and vitamin A (such as: dairy foods, eggs, margarine, fish, lettuce, brussel sprouts, beans cabbage etc.) or a vitamin A supplement if they are not able to consume adequate amounts of vitamin A through food alone.

Limitations of this study include a small sample size, with 32 patients included in the study, with less than half of these on the moderate approach. This study involves filling in several questionnaires and two WFRs which may attract certain task oriented personality types so selection bias may be evident (Andersson, 2015). Foodworks does not have all food options

on its database, so choosing similar alternatives had to be done and complete nutritional information was not always available for some food alternatives.

Conclusion

This research showed that on the elimination diet patient's intake of carbohydrate and protein improved and became closer to the AMDR and there was an increase in core foods and a decrease in discretionary food consumption. However, the intake of calcium, folate and vitamin A could be low therefore requiring dietary advice on suitable alternatives and/or supplementation. Patients on the strict elimination diet had lower intakes of vitamin A than those on the moderate approach. Supplement use did increase patients calcium, folate and vitamin A intake however even with supplements not all patients met the EAR for calcium, especially in menopausal women with increased requirements. Detailed advice on suitable calcium fortified foods, dairy alternatives and calcium supplements need to be addressed at the patient's initial consultation is an essential part of educating patients regarding the elimination diet and challenge protocol.

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Appendix I

RPAH ALLERGY UNIT

9-11 Layton St, Camperdown NSW 2050

P: 9515 3300 F: 9519 8420

E: info@allergy.net.au



(Date)

SCREENING QUESTIONNAIRE AND RECRUITMENT TELEPHONE SCRIPT

Nutritional Adequacy and Factors Influencing Dietary Compliance in Children and Adults on the RPAH Elimination Diet

Hello _____,

My name is _____ and I am a student dietitian from the RPAH Allergy Unit. I am calling about your/your child’s upcoming appointment at the allergy unit on (date) and (time). Are you still able to attend?

Yes / No → OK, would you like me to cancel this appointment or arrange for one of the secretaries to call you to organise another time?

↓

Thank you. I will record that you have confirmed this appointment. I’d also like to let you know about a study we are conducting to assess the nutritional adequacy of the Elimination Diet we use for food intolerance.

There is no obligation for you to be involved but I can tell you more about it if you think you might be interested?

Yes / No → Thank you, that is fine. Your appointment has been confirmed and you will receive an email with additional details. Please read this before you attend the clinic as it has important information in it. We look forward to seeing you then.

↓

Ok, firstly can I just ask a few details so I can tell whether you/your child qualifies for the study?

What is the main reason for attendance?

↓

Suitable /Not suitable → From the information you have told me, it looks like the study

↓

_____ may not be suitable for you. Thank you for taking the time to

Inclusion criteria – any initial patients likely to go on the Elimination Diet, i.e. those with:

- Urticaria/angioedema
- Eczema
- Irritable bowel syndrome
- Migraine
- Food reactions
- Symptoms suspected to be food related

Exclusion Criteria – anyone who has seen a dietitian at the Allergy Unit previously for Food Intolerance and/or has done the Elimination Diet

_____ speak to me. Your appointment has been confirmed and you will

receive a reminder email with additional details. Please read this before you attend the clinic as it has important information in it. We look forward to seeing you then.

It looks like the study may be suitable for you/your child. Briefly, the study will be assessing the nutritional adequacy of your/your child's diet. This will involve keeping a detailed food diary for a short period of time before your first appointment and then again on follow up. We will also be assessing general health, eating habits and quality of life which will require you to fill out some questionnaires when you attend the Allergy Unit.

Participation in this research is voluntary. If you don't want to take part, you don't have to. If you decide to take part and later change your mind, you're free to withdraw from the study at any stage. Whether you decide to participate or not will not affect the treatment you/your child receives, your relationship with Royal Prince Alfred hospital or those caring for you at the Allergy Unit.

Would you like me to post you some more information about the study?

Yes /No → Thank you, that is fine. Your appointment has been confirmed and you will receive an email with additional details. Please read this before you attend the clinic as it has important information in it. We look forward to seeing you then.



Would you prefer to be sent the information by post or email? What is the best address for me to send you the information?

Thank you. Your appointment has been confirmed and you will receive an email with additional details. Please read this before you attend the clinic as it has important information in it. We look forward to seeing you then.

Table 1: Calcium consumption: Incorporating supplement use and calcium consumption comparing Baseline and On Elimination Diet WFRs

		Total Group n=32			No Calcium Supplement n=29			Calcium Supplement n=3		
Baseline WFR		n	n meeting EAR(%)†	Calcium intake (mg) Mean (SD)	n	n meeting EAR(%)†	Calcium intake (mg) Mean (SD)	n	n meeting EAR(%)†	Calcium intake (mg) Mean (SD)
Food only	Patients Consuming Dairy	26	10 (38)	818 (271.5)	24	10 (42)	821 (281.8)	2	0 (0)	768 (117.3)
	Patients Restricting Dairy	6	0 (0)	595(193.9)	5	0 (0)	566 (202.0)	1	0 (0)	738 (na)
	All Patients	32	10 (31)	678 (307.9)	29	10 (35)	777 (284.0)	3	0 (0)	768 (270.8)
Food and Any Supplements	Patients Consuming Dairy	9	2 (22)	860 (277.8)	7	2 (29)	774 (240.1)	2	1 (50)	1160 (199.2)
	Patients Restricting Dairy	1	0 (0)	928 (na)	0	na	na	1	0 (0)	928 (na)
	All Patients	10	2 (20)	886 (262.8)	7	2 (29)	774 (240.1)	3	1 (33)	1082 (194.3)
		Total Group n=32			No Calcium Supplement n=18			Calcium Supplement n=14		
Elimination WFR		n	n meeting EAR(%)†	Calcium intake (mg) Mean (SD)	n	n meeting EAR(%)†	Calcium intake (mg) Mean (SD)	n	n meeting EAR(%)†	Calcium intake (mg) Mean (SD)
Food only	Patients Consuming Dairy	9	1 (11)	759 (276.0)	5	1 (20)	875 (243.0)	4	0 (0)	614 (271.7)
	Patients Restricting Dairy	23	5 (22)	647 (319.7)	13	4 (31)	642 (355.3)	10	1 (10)	653 (285.5)
	All Patients	32	6 (19)	776 (270.85)	18	5 (28)	707 (338.4)	14	1 (7)	642 (217.7)
Food and Any Supplements	Patients Consuming Dairy	5	2 (40)	1074 (355.2)	1	0 (0)	806 (na)	4	3 (75)	1141 (371.8)
	Patients Restricting Dairy	12	8 (67)	1182 (379.6)	2	1 (50)	915 (415.0)	10	7 (70)	1236 (371.4)
	All Patients	17	10 (59)	926 (603.0)	3	1 (33)	879 (300.2)	14	10 (71)	1209 (359.7)

WFR, Weighed Food Record

EAR, Estimated Average Requirements

Food only, Calcium intake from all foods consumed in the four day WFR

Food and Supplements, Calcium intake from all foods and supplements consumed in the four day WFR

†840mg for Women under 50 years old and Men under 70 years old. 1100mg for Women older than 50 and Men older than 70 (10)

Table 2: Dietary Folate Equivalent (DFE) consumption: Baseline and On Elimination Diet WFRs comparison, with and without supplements

	Total Group n=32			No Folate Supplement n=29			Folate Supplement n=3		
Baseline WFR	n	n meeting EAR(%)†	DFE(µg) Mean (SD)	n	n meeting EAR(%)†	DFE (µg) Mean (SD)	n	n meeting EAR(%)†	DFE (µg) Mean (SD)
	Food only	32	20 (63)	358 (156.2)	29	12 (41)	360 (135.8)	3	3 (100)
Food and Any Supplements	10	4 (40)	374 (245.9)	7	1 (14)	261 (75.1)	3	3 (100)	637 (327.2)
	Total Group n=32			No Folate Supplement n=22			Folate Supplement n=10		
Elimination WFR	n	n meeting EAR(%)†	DFE (µg) Mean (SD)	n	n meeting EAR(%)†	DFE (µg) Mean (SD)	n	n meeting EAR(%)†	DFE (µg) Mean (SD)
	Food only	32	5 (16)	254 (108.4)	22	2 (9)	237 (104.4)	10	3 (30)
Food and Any Supplements	17	10 (59)	416 (214.9)	7	0 (0)	223 (66.9)	10	9 (90)	788 (173.0)

WFR, Weighed Food Record

EAR, Estimated Average Requirement

Food only, Folate intake from all foods consumed in the four day WFR

Food and Supplements, Folate intake from all foods and supplements consumed in the four day WFR

†320mg for Women and Men (10)

Table 3: Vitamin A consumption: Comparing Baseline and on Elimination Diet WFR, separated into Strict and Moderate Approach.

	Food Only			Food and Vitamin A Supplements		
	n	n meeting EAR(%) [†]	Vitamin A intake (μg) Mean (SD)	n	n meeting EAR(%) [†]	Vitamin A intake (μg) Mean (SD)
Baseline WFR						
Moderate	7	6 (86)	1628 (1244.8)	0	na	na
Strict	25	13 (52)	899 (566.9)	4	4 (100)	945 (200.3)
All Patients	32	19 (59)	1058 (801.6)	4	4 (100)	945 (200.3)
Elimination WFR						
Moderate	7	7 (100)	1022 (277.0)	4	4 (100)	1663 (475.1)
Strict	25	9 (36)	474 (266.6)	6	5 (83)	910 (460.7)
All Patients	32	16 (50)	594 (350.5)	10	9 (90%)	1211 (587.1)

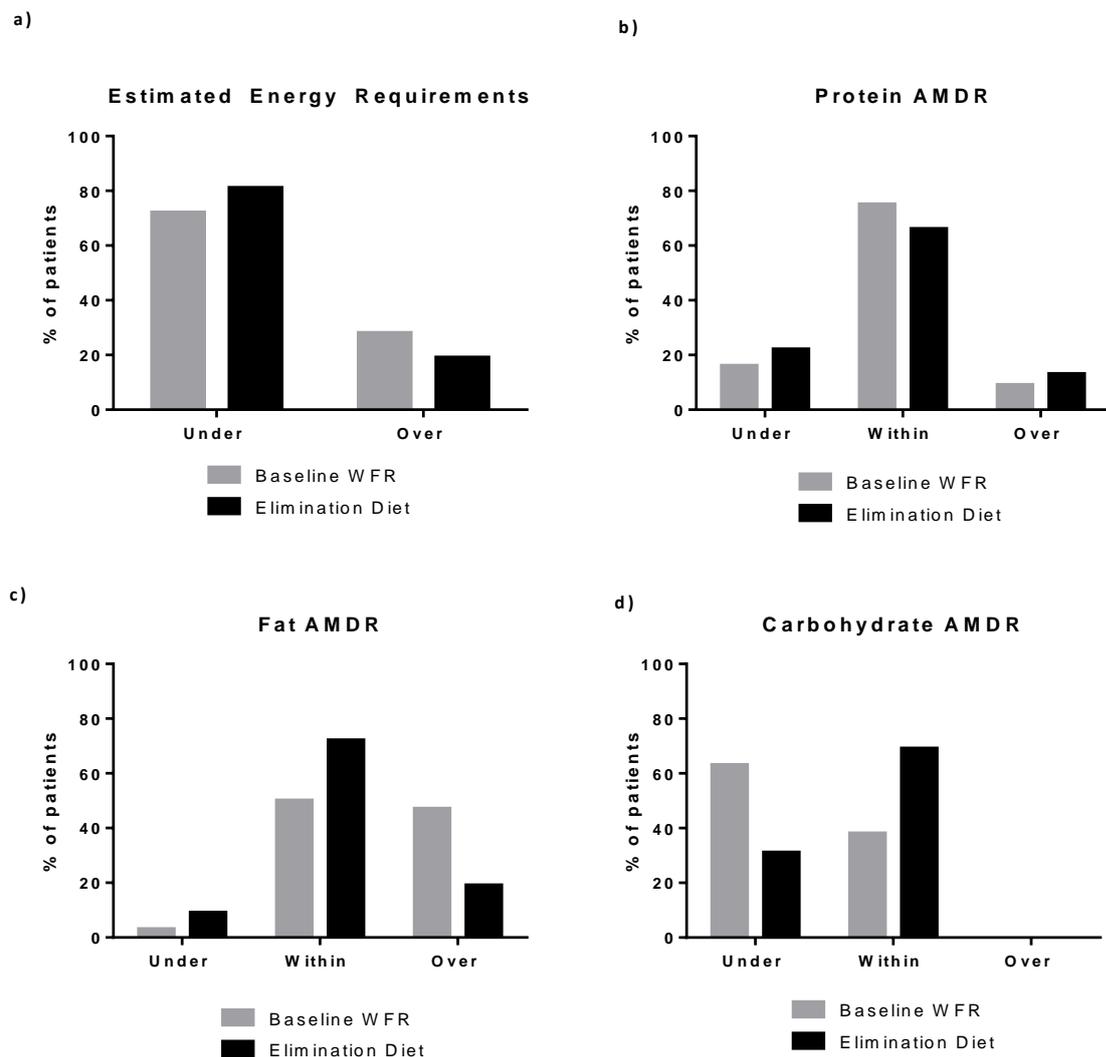
WFR, Weighed Food Record

EAR, Estimated Average Requirement

Food only, Vitamin A intake from all foods consumed in the four day WFR Food and Vitamin A Supplements, Vitamin A intake from all foods and supplements consumed in the four day WFR

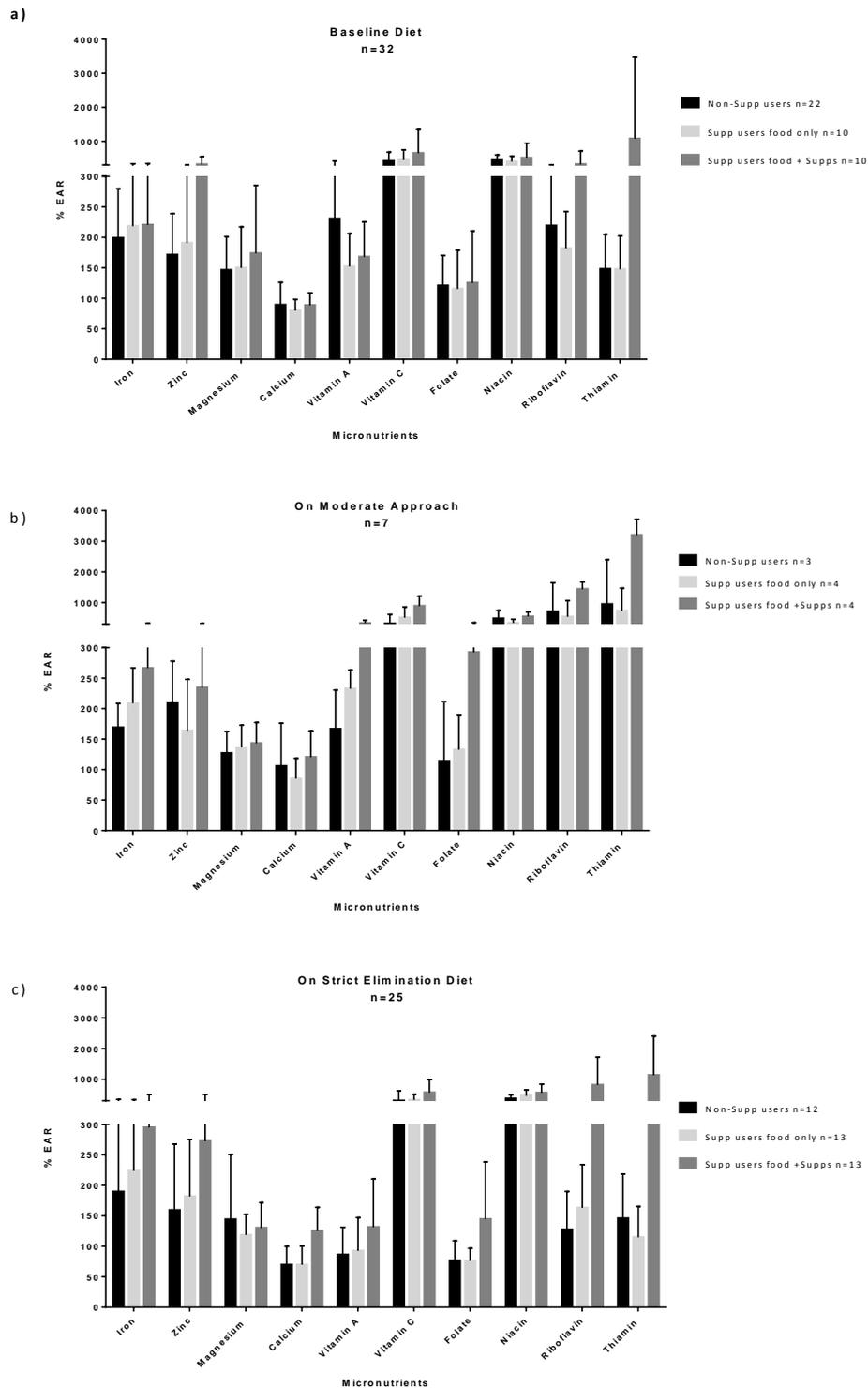
[†] 500μg for Women and 625μg for Men (10)

Figure 1: Percentage of Patients Meeting the Estimated Energy requirements and Acceptable Macronutrient Distribution Range.



- a) EER as calculated by Scholfield's equation
 b) Protein AMDR: Under <15% EEI, Within >15% and <24% EEI, Over >25% EEI (10)
 c) Fat AMDR: Under <20% EEI, Within >20% and <35% EEI, Over >20% EEI (10)
 d) Carbohydrate AMDR: Under <45% EEI, Within >45% and <65% EEI, Over >65% EEI (10)

Figure 2: Micronutrients meeting the Estimated Average Requirements at Baseline and On Elimination Diet (strict and moderate approach)



Non-Supp users: All patients not consuming supplements

Supp users food only: Patients who consume supplements, looking at vitamin and mineral intake from food intake only

Supp users food + Supps: Patients who consume supplements, looking at vitamin and mineral intake from food intake and supplement intake

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