

Proceedings of the Nutrition Society

Abstracts of Original Communications

A Scientific Meeting was held at The Teacher Building, Glasgow, UK, 8 May 2007, when the following papers were presented.

All abstracts are prepared as camera-ready material.

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Use of special diets, nutritional supplements and alternative therapists in a paediatric population of inflammatory bowel disease. By K. GERASIMIDIS¹, P. MCGROGAN², K. HASSAN² and C.A. EDWARDS¹, ¹Human Nutrition Section, Division of Developmental Medicine, Yorkhill Hospitals, Glasgow G3 8SJ, UK and ²Department of Paediatric Gastroenterology, Hepatology and Nutrition, Yorkhill Hospitals, Glasgow G3 8SJ, UK

Prevalence of complementary and alternative medicine (CAM) in paediatric patients with inflammatory bowel disease (IBD) remains unknown. CAM may interfere with the efficacy of conventional treatment and may have side effects.

The aim of the present study was to assess the prevalence of use, predictors of use and parental concerns and attitudes about the use of CAM in the entire population of paediatric patients with IBD in the West of Scotland.

Families of patients with IBD from the only paediatric referral centre in the West of Scotland were asked to complete and post an anonymous questionnaire. They were questioned about common types of alternative therapists, nutritional supplements and dietary modifications used for the management of IBD only. Demographics, disease and cumulative laboratory, treatment, anthropometric and growth data were retrieved from the case notes.

A total of 104 patients were approached (77% of the eligible population) and eighty-six (83% response) of the participants [40 females; median age 12.7 (range: 4.8–17)y; median duration of disease 2.4 (range: 0.4–7)y] completed the survey. CAM use was high, with 60.5% having used at least one type, and 37.2% were using CAM at the time of recruitment. Prevalence (%) was probiotics 44.2, dairy-free diet 27.9, fish oils 26.7, aloe 18.6, gluten-free diet 15.1, homeopathy 13.9, massage 12.8. Higher parental education and young parental age were the only independent predictors of CAM use ($P=0.001$ and $P=0.005$ respectively) in a multiple-regression model. CAM users were then divided into self-prescribed CAM users and CAM therapists users. Based on multiple-regression analysis an increased number of oral steroid courses and use of CAM for other health reason were additional predictors that differentiated CAM therapists users from non users ($P=0.021$ and $P=0.009$ respectively).

Reasons given for CAM use were (% of respondents): to complement conventional medicine 44.7, personal recommendation 42.1, CAM is natural or not harmful 31.6, conventional medication side effects 28.9. Of the respondents 48.5% judged CAM at least partially effective. Two patients (6.1%) reported side effects or deterioration of IBD.

Of respondents 74% disagreed with the statement that they are not a person that would use CAM. Also, 85.7% agreed that doctors should be supportive of use. Approximately 60% agreed that little is known about CAM and 50% had no opinion on whether CAM is safe. Approximately 57% would be happy for their children to take any type of CAM and 89% would give CAM to their children if they felt that CAM would be of any help.

Although for most of the CAM types the clinical efficacy is questionable, this Scottish survey found the use of CAM to be higher than in similar studies in adults. When prescribed medication fails to work, the hidden use and interaction of CAM should be considered. The gastrointestinal nature of the disease could explain the high use of nutritional supplements and special diets in this survey in contrast to other chronic diseases for which other holistic types of CAM are predominant.

Konstantinos Gerasimidis was a recipient of a scholarship from the Greek State's Scholarship Foundation.

Trends in consumption of foods among supplement users within the Norfolk arm of the European Prospective Investigation into Cancer (EPIC-Norfolk). By M.A.H. LENTJES, A.A. MULLIGAN, A. BHANIANI, S.A. BINGHAM, K.T. KHAW and A.A. WELCH, Cambridge University, Department of Public Health and Primary Care, Strangeways Research Laboratory, Worts Causeway, Cambridge CB1 8RN, UK

According to national surveys the percentage of supplement users (SU) has risen by 22% in recent years¹. Previous studies have indicated that SU have a higher nutrient intake than non-supplement users (NSU) and are more health conscious². We therefore investigated the socio-demographic characteristics and trends in food-group choices of foods perceived as healthy between SU and NSU in a population study, the EPIC-Norfolk cohort.

Participants (n 13647) completed a 7 d food diary and recorded supplement use for 1 week³, describing the supplements by brand, name, dose and frequency. This information was coded and entered in a database, and SU identified. Diaries were entered using DINER (Data Into Nutrients for Epidemiological Research)⁴ and data for food groups were created. Only participants who completed a minimum of 3 d of their food diary were included in these analyses.

The characteristics of 5174 SU and 8473 NSU were analysed. As previously found SU were older, had a lower BMI, were more likely to be non-manual labourers or women and less likely to be current smokers ($P<0.05$). When food intake was categorised into quintiles (Table 1), significant trends in the percentage of participants in SU group were found with increase in fruit, vegetables, fish, wholegrain products and wine consumption (Table 2). These trends remained significant after adjusting for age, BMI, smoking status and social class, except for wine consumption.

SU are more likely to eat more of foods considered to be healthy choices than NSU and so are less likely to derive additional benefit from the nutrients contained in supplements.

Table 1

Food (g) n 13647	Q1			Q2			Q3			Q4			Q5		
	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median	Mean	SD	Median
Fruit & vegetables	87	34	93	172	20	173	241	20	240	323	29	321	510	142	469
Wholegrain	0.4	1.1	0	18	8	18	47	9	46	86	14	85	191	80	167
Fish	2	4	0	20	4	20	32	4	32	49	5	49	85	28	76
Wine	0			18	7	22	52	12	47	102	18	97	249	119	212

Table 2

	Q1		Q2		Q3		Q4		Q5		P for trend
	% SU	SU/NSU	% SU	SU/NSU	% SU	SU/NSU	% SU	SU/NSU	% SU	SU/NSU	
Men (n 6614)											
Fruit and vegetables	25	388/1142	29	407/1005	33	421/864	36	452/804	40	448/683	<0.001
Wholegrain	23	346/1148	28	333/844	33	373/775	35	417/780	41	647/951	<0.001
Fish	28	354/906	30	357/817	32	413/864	33	441/884	35	551/1027	<0.001
Wine	30	968/2295	34	239/457	35	323/600	34	249/484	34	337/662	<0.01
Women (n 7033)											
Fruit and vegetables	32	384/815	40	527/791	45	651/793	47	691/783	50	805/793	<0.001
Wholegrain	35	429/787	38	604/969	44	697/883	49	745/788	52	583/548	<0.001
Fish	42	615/852	42	659/899	42	605/847	44	623/782	48	556/595	<0.01
Wine	41	1371/2001	46	469/553	47	469/534	46	374/446	46	375/441	<0.001

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Results from a new online method for measuring undergraduate student diet. By F. COMRIE¹, N. COCHRANE¹, L. AUCOTT², J. LEMON³ and G. McNEILL¹, ¹*Department of Environmental & Occupational Medicine, University of Aberdeen, Foresterhill Road, Aberdeen AB25 2ZP, UK*, ²*Department of Public Health, University of Aberdeen, Polwarth Building, Aberdeen AB25 2ZD, UK*, ³*Directorate of Information Technology, University of Aberdeen, Dunbar Street, Aberdeen AB24 3QY, UK*

The health of students is a neglected issue. Students may be at risk of developing poor dietary habits due to lack of work or study routines. An online food recall checklist (FoRC) was developed for use with undergraduate students at the University of Aberdeen. FoRC is a ninety-six-item checklist based on a 24h recall, on which participants enter food and drinks consumed on the previous day. Foods were chosen based on typical foods consumed by students, using other dietary-assessment questionnaires as a guide. Participants estimate portion sizes in FoRC using a photographic reference. After a small paper-based pilot, portion size issues were addressed and extra foods were added. FoRC was designed using Snap Survey Software (SnapSurveys Ltd, Thornbury, Bristol, UK).

Participants were recruited online during March 2005. They were offered a prize draw incentive of music vouchers to complete a 1d food record in FoRC. Participants also completed a short survey of demographic data and attitudes to food before they completed FoRC. In 2 weeks 421 participants were recruited; 390 undergraduates (273 female, 117 male) completed all three parts of the survey. Of the responses 35% were returned the day after the recruitment email was sent; 80% were returned within 1 week. Mean time taken to complete the survey was 10.6min. Of the respondents 78% were in the normal-weight BMI category, compared with 52% in a similar-aged nationally-representative sample¹. Data collected on attitudes to food showed that the sample had a positive attitude to healthy eating; 81% of the participants reported that having a healthy diet was important to them.

Mean female daily energy intake (EI) was 7.31 MJ compared with 7.00 MJ for a similar sample in a national survey of the UK diet¹. For males mean daily EI was 9.52 MJ compared with 9.44 MJ in the national survey¹. Dietary information collected by FoRC was also compared with the Scottish dietary targets². Of the participants 72% consumed less than the maximum recommended daily fat intake and 85% consumed less than the maximum advised daily alcohol intake. However, only 42% met breakfast-cereal guidelines, 25% met NSP-intake guidelines, 23% met bread-intake guidelines and 20% met fruit and vegetable recommendations. These six nutrients and foods were assigned one point towards a healthy eating score (HES) if the target was met. Median HES was 2 for male and 3 for female participants. Normal-weight participants had a median HES of 3 compared with an HES of 2 in overweight participants. Median HES was significantly higher ($P < 0.001$) in participants who reported that having a healthy diet was important to them (HES 3) compared with those who stated it was occasionally or never important (HES 2).

The new dietary-assessment method was found to be an appropriate measure of 1d dietary intake in this sample. The comparison with Scottish dietary targets shows that these students do not consume a healthy diet, despite most stating that healthy diet was important to them. FoRC was not believed to be a good indicator of alcohol intakes, as these were much lower than expected. The online approach to FoRC enabled researchers to collect data on a large number of subjects, whilst cutting recruitment and data analysis time. Further development and testing is ongoing to assess if FoRC can be used as a measure of habitual diet and for giving web-based diet feedback.

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2. Working Group on Monitoring Scottish Dietary Targets (2004) *Monitoring Scottish Dietary Targets.* Aberdeen: Food Standards Agency, Scotland.

Investigation of the relationship between perceived stress and cholesterol in healthy volunteers. By V. WONG¹, M.R. RITCHIE², L.J. MACKINNON¹, S.E.E. GATES¹, A. GILMOUR¹, A. RAVISHANKAR¹, S. RAMNARINE and T.J. GIBBS¹, ¹*Bute Medical School, University of St Andrews, St Andrews, Fife KY16 9TS, UK* and ²*Dept of Education, Dundee, Tayside, DD2 4DW, UK*

There is increasing evidence from human studies that mental stress can increase heart rate, lower the immune system's ability to fight colds and increase certain inflammatory markers. However, little is known about the effect of mental stress on an individual's cholesterol and whether mental stress correlates with changes in cholesterol.

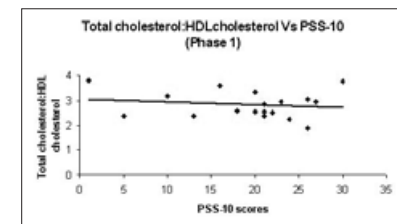
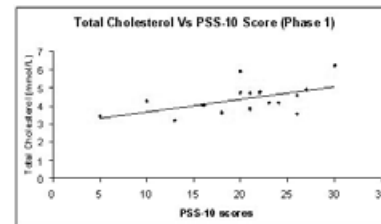
The aim of the current study was to investigate the relationship between mental stress, assessed using a Perceived Stress Scale Questionnaire (PSS-10) and total cholesterol and HDL-cholesterol in blood samples obtained from healthy volunteers at two distinct time points (phase 1 and phase 2, each phase was six days long). Phase 1 took place during the university examinations period and Phase 2 during an exam-free period. Phases were six weeks apart, as the study was tailored to accommodate students' timetables and examinations.

Eighteen volunteers (seven females, eleven males, age range 19–58 years) completed phase 1 of the study and eleven of the initial volunteers (four females, seven males, age range 19–58 years) completed phase 2. All PSS-10 questionnaires and blood samples were analysed and the following results were obtained.

Phase 1:

Total cholesterol v. PSS-10 score: $y = 0.07x + 2.97$;
 $R = 0.53$; $p < 0.05$; $n = 18$;

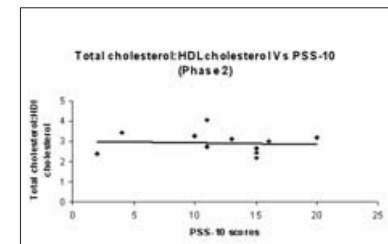
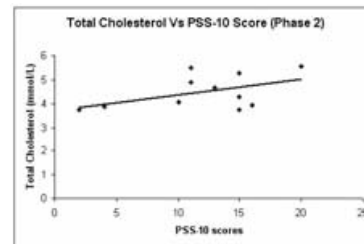
Total cholesterol:HDL cholesterol v. PSS-10 score:
 $y = -0.01x + 3.07$; $R = 0.17$; p NS; $n = 18$



Phase 2:

Total cholesterol v. PSS-10 score: $y = 0.06x + 3.72$; $R = 0.50$;
 p NS; $n = 11$;

Total cholesterol:HDL cholesterol v. PSS-10 score:
 $y = -0.0078x + 3.03$; $R = 0.08$; p NS; $n = 11$



The results demonstrate a relationship between mental stress and total cholesterol, which is statistically significant when larger numbers of volunteers are included. However, when the ratio of total cholesterol:HDL cholesterol is taken into account, increased mental stress shows a negative correlation with the ratio. This may be due to natural protective mechanisms capable of reducing the negative effects of perceived stress on the cardiovascular system or lack of accuracy of PSS-10 questionnaires in assessing perceived stress.

Monitoring phyto-oestrogen exposure in patients with breast cancer after diagnosis. By A. GILMOUR¹, M.R. RITCHIE², L.J. MACKINNON¹, V. WONG¹, C. CHARLTON¹, C.M. STEEL¹, S.E.E. GATES¹, J. SMITH² and T.J. GIBBS¹, ¹*Bute Medical School, University of St Andrews, Fife, KY16 9TS, UK and* ²*Department of Education, Dundee, Tayside DD2 4DW, UK*

Although diet may influence the incidence of many cancers, some 30–45% of patients who survive breast cancer alter the diet following diagnosis¹. In addition, the effect of dietary changes on risk of recurrence or response to cancer treatments is poorly understood¹. Phyto-oestrogens (PE) are plant-based compounds that have been implicated in reducing breast cancer risk. However, few studies have monitored PE exposure in cancer patients after diagnosis or during cancer therapy. As far as we are aware this study is the first to use a newly-developed biomarker of PE exposure^{2,3} to monitor self-initiated changes in PE intake in breast cancer patients after diagnosis and during cancer treatment.

Twenty-four patients (age range 39–76 years) completed a food frequency questionnaire (FFQ) and provided a timed spot urine (urine 1) before surgery. FFQ and urine samples were analysed for total PE (genistein+daidzein) content. Patients provided a follow-up urine sample 3 months after surgery (urine 2) and every 3 months thereafter. Cancer treatment during urine sample collection was recorded.

Fifteen of the twenty-four patients provided follow-up urine samples.

Patient No.	Urine 1		Total Urine PE		Urine 2		Total Urine PE
	Daidzein ng/ml	Genistein ng/ml	Urine 1	Age	Daidzein ng/ml	Genistein ng/ml	
1	292	117	409	53	244	257	501
2	33	4.2	37.2*	39*	138	89	228*
3	0	48	48*	39*	242	71	313*
4	120	80	200	59	392	300	292
5	116	140	256	60	459	300	259
6	222	100	322	56	233	112	343
7	28.5	70.6	99.1	74	326	280	206
8	0	8	8	86	0	3	3
9	796	319	1115	54	518	243	761
10	220	75	295	39*	1557	220	1777*
11	29	20	49	39*	730	245	975*
12	45	27	72	60	100	52	152
13	145	105	250	70	124	87	211
14	79	30	109	56	103	29	132
15	250	125	375	53	230	87	337

The most noticeable differences between PE concentrations in urine 1 (baseline) and urine 2 (3 months after surgery) were noted in the 4 youngest patients (all 39 years old). For these patients PE concentrations in urine 2 were almost 6 fold higher than those in urine 2 obtained from older patients. Ages of patients were not evenly distributed due to the fact that breast cancer is more common in women over the age of 50 and this was reflected in the composition of the group.

Patients with breast cancer (especially younger women) may change their PE intake after diagnosis and during cancer treatment. Follow up, using biomarkers, may provide insight into the effects of altered PE exposure.

This study was funded by The Melville Trust for the Care and Cure of Cancer, Scotland.

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3. Ritchie MR, Morton MS, Deighton N, Blake A, Cummings JH & Steel CM (2004) *Journal of Evidence-Based Integrative Medicine* **1**, 101–112.