Original research

Constipation and diet in a community sample of older Australians

Wendy Hunter, Gwyn P. Jones, Helen Devereux, Ingrid Rutishauser and Nicholas J. Talley

Abstract

Objective: To estimate the prevalence of constipation and laxative use in a sample of people 65 years and over and examine relationships between usual diet and constipation.

Design: A mailed survey using validated instruments to measure bowel habit and laxative use with follow-up interviews to collect dietary data.

Subjects and setting: Three hundred and thirty people aged 65 years and over living at home in Melbourne were randomly selected from the electoral roll of a federal electorate.

Statistical analysis: Descriptive statistics, frequencies and two sample t-tests were used.

Results: Seventy-nine people responded to the mailed bowel survey and 61 were interviewed to collect food intake data. The proportion of constipated people was approximately one quarter ($n = 18$). Laxative use in the previous 12 months was reported by a fifth of respondents and in these subjects one in four was not constipated. Analysis of the dietary data revealed that the average number of cereal and vegetable serves consumed per day was similar to the national average but less than recommended by nutrition bodies although fruit intake met these recommendations. Constipated subjects consumed fewer serves from the cereals food group than those who were not constipated (2.9 and 3.5 serves respectively, $P = 0.03$).

Conclusion: Constipation and laxative use appears to be as common in older Australians as in similar populations overseas. Low intake of cereal foods may be a contributing factor. (Nutr Diet 2002;59:253–9)

Key words: constipation, laxatives, diet, older Australians, cereals, fruit, vegetables

Introduction

Several studies indicate that constipation is a common problem in older people (65 years and over) and that it adversely affects quality of life (1–2). It is presumed to be a motor disorder of the bowel and is generally characterised as functional, using defined symptom criteria such as those of the Rome criteria I (3) or is self-reported based on individual perception with undefined symptoms that may or may not be associated with functional symptoms (4).

The prevalence of constipation among the older general population in Australia has received little attention, although a survey of women’s health in this country found that 24% of women aged 70 to 75 years self-reported constipation (5). In New South Wales an investigation of the relationship between diabetes, constipation and socioeconomic status reported a prevalence of constipation ranging from 6.3 to 10.3% (6). In overseas communities, approximately 25 to 30% of people over the age of 65 years report themselves to be constipated with up to 12% experiencing symptoms indicative of functional constipation (4,7–8).

Laxative use also appears to be extensive with estimates of their use in up to 50% of people aged over 65 years in any 12-month period (4,9). They may be obtained on medical advice or self-prescribed and purchased over the counter at pharmacies, supermarkets and health food shops. Up to 30% of apparently healthy older Americans are reported to be consumers of these products (8). Overuse of laxatives is known to have detrimental effects on the bowel, as well as interfering with drug and nutrient absorption (10), therefore self-medicating with laxatives may not be the optimal solution for older people even though the laxatives may appear to provide more immediate relief from symptoms than other options (11). Among nutrition and health professionals, first line treatment of constipation generally includes dietary management, exercise and bowel re-training (11).

The health benefits of a high-fibre diet in prevention or treatment strategies for the management of constipation have been demonstrated (12). There is a strong positive correlation between fibre intake, particularly insoluble fibre, faecal weight and reduced transit time (13–14). Grains are a valuable source of dietary fibre and resistant starch, both of which have a beneficial effect in the large intestine (15). Increasing the intake of foods rich in these constituents can alleviate constipation but clinical trials of fibre supplements are not so convincing (16). The Dietary Guidelines for Older Australians, that were developed in order to address the changing nutritional needs of healthy and independent older people, highlight the positive relationship between dietary fibre (specifically from cereals, breads and pasta) and improved bowel function (17). However, while they promote the consumption of vegetables, legumes and fruit for their fibre, they do not specifically relate these foods to the treatment or management of constipation.

The health benefits of dietary fibre in alleviating constipation have been documented, but modifying the diet to increase intake can be difficult (7,18–19). For example, the

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1995 National Nutrition Survey (20) revealed that most people over the age of 65 years expressed no desire to change their intake of fruits, vegetables or cereals. This reluctance to change is recognised in the introduction to the Dietary Guidelines for Older Australians.

In most cases where dietary change is suggested it will be appropriate to optimise nutrition by marginal changes to people’s diets, rather than attempting a complete change away from long established food habits (17).

The Australian Guide to Healthy Eating (21) gives practical suggestions on the amounts of different food groups needed for a healthy diet. Table 1 shows the recommendations for males and females aged 60 years and over. These recommendations provide two eating patterns with varying quantities for each of the food groups, to allow for individual preferences. The total number of serves from cereals, vegetables and fruit food groups recommended for males and females (> 60 years of age) is higher than the 1995 national average intake of 7.8 serves comprising three serves of breads or cereals, 3.5 serves of vegetables, 0.1 of a serve of legumes and 1.2 serves of fruit (20).

Energy intake is also thought to be a contributing factor to constipation. As people age, their energy intake decreases, usually through reducing food consumption in foods high in dietary fibre and this is particularly observed among females (22).

This pilot study set out to survey a community-based sample of older Australians to establish the extent of constipation and laxative use and to look for associations with diet, particularly intake of cereals, vegetables and fruit. Participants’ perceptions of their current diet and factors that may inhibit or facilitate change towards increased consumption of fibre-rich foods were also investigated.

Methods

Definition of constipation

Functional or chronic idiopathic constipation, as defined in this study is based upon the recommendations of an international workshop on management of constipation (Rome criteria I) (3). This requires the presence of two or more of the following symptoms over a 12-month period: straining more than 25% of the time; hard stools more than 25% of the time; feeling of incomplete evacuation more than 25% of the time; less than three stools per week usually or fewer than two stools per week usually in the absence of the symptoms listed above.

Subjects were recorded as being constipated by self-report if they answered ‘yes’ to the question, ‘Do you regularly experience recurrent constipation (occurs more than once per year)?’.

Study design

An age-stratified list of 19 607 names and addresses was obtained from the Australian Electoral Commission for a Melbourne metropolitan federal electorate, (population 159 124), which had a higher proportion of residents aged 65 years and over (14%) than the national average (12.2%). This list was transferred into a computer spreadsheet, which was used to randomly select a sample of 330. In overseas studies, response rates for bowel surveys have averaged approximately 60%, however these have used a variety of sampling frameworks including volunteers, patient lists as well as random samples drawn from the general population (6–7). However in Australia, responses to mailed surveys can be lower, for example 37% for a health survey of Australian women aged 70 to 75 years (5). Therefore we assumed a response rate of 50% and a population proportion with functional constipation of 15%. This required a sample size of 330 for a prevalence estimate with a 95% confidence level and with an approximately 6% margin of error. This error margin was considered acceptable for a pilot survey.

An introductory letter and bowel symptom questionnaire were then mailed out. Non-responders received a reminder letter after two weeks followed by a telephone call. Information on food consumption, perceptions and attitudes to food was collected at interview.

To be included in the study subjects had to be:
- community dwelling;
- aged 65 years or over;
- able to do their own shopping.

Subjects were excluded if:
- they had advanced dementia and were unable to complete the questionnaire;
- they had bowel cancer as it would be difficult to determine a normal bowel pattern;
- they were receiving ‘meals on wheels’ as this would have restricted food choice.

However, respondents were not excluded if they were taking medication that might cause constipation, such as aspirin and beta blockers. Based on results from a survey in the UK, it is likely that more than 50% of older people are taking medications that could be constipating (23), and therefore to exclude them would mean that we would not

<table>
<thead>
<tr>
<th>Table 1. Recommended serves of food for men and women 60 years and over from the Australian Guide to Healthy Eating (21)</th>
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<tbody>
<tr>
<td><strong>Bread, cereals, rice, pasta, noodles</strong></td>
</tr>
<tr>
<td><strong>Men</strong></td>
</tr>
<tr>
<td>Option A</td>
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<tr>
<td>Option B</td>
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<tr>
<td><strong>Women</strong></td>
</tr>
<tr>
<td>Option A</td>
</tr>
<tr>
<td>Option B</td>
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know whether changes in diet would be effective for a large proportion of the population.

Ethics

The project was approved by the Deakin University Ethics Committee (project number EC99-197).

Bowel symptom questionnaire

A validated bowel symptom questionnaire (24) was used to record bowel functions of respondents that could be used to diagnose subjects as having normal bowel function or constipation. Also included were questions on general health, laxative use, gender, age, education, and marital status. Most questions only required a yes or no response, but some questions required subjects to select a category of response (i.e. never, occasionally, sometimes, and often). Diagrams were included to assist respondents to identify the body region of any pain experienced that might be related to the gastrointestinal tract. Respondents were able to add comments if desired.

Interviews

Respondents who agreed to participate in the interviews, were contacted by telephone to arrange a suitable appointment. Trained interviewers conducted 'face-to-face' interviews in participants' own homes. The interviews were a combination of qualitative and quantitative questions exploring subjects' definitions of constipation and their perceptions as to why they were or were not constipated. Subjects were asked to recall all foods and fluids they had consumed on the previous day (over the whole 24 hours) and were shown standard cup measures to assist in their interpretation of serve sizes and fluid volumes as described in the Australian Guide to Healthy Eating (21). In addition, subjects were also asked the frequency of consumption of cereals, fruit, vegetables, supplements and fluids and to self-report the number of serves of vegetables and fruit they usually consume in a day. The frequency questions were those used in the 1995 National Nutrition Survey (20). Questions on attitudes and beliefs were used to obtain information on perceived barriers to dietary change (25). Data were also collected on quality of life (not presented).

Data analysis

All data were coded and entered into a database (Microsoft Access, 1997). Descriptive statistics were obtained using statistical software (STATA Corporation, College Station, Texas, STATA version 6 1999 and Microsoft Excel 1997). Descriptive statistics, frequencies and two sample t-tests with 95% level of significance were used in the analysis of the quantitative data.

For analysis of the bowel symptoms questionnaire subjects were classified as either not constipated or constipated based on the two definitions of constipation described above. However, the constipated group have been sub-grouped as follows:

- those who have functional constipation alone;
- those who have functional constipation and also self-report constipation;
- those who self-report constipation but are not functionally constipated.

The 24-hour dietary recalls were entered into the FoodWorks program (Xyris Software (Australia), Brisbane, version 3 2002), that was used to convert dietary fibre into grams from individual intakes of food items.

Qualitative content analysis was conducted on the open-ended responses to interview questions. These were coded and then categorised into themes. Frequency was measured by counting participants’ responses within each theme.

Results

Of the 330 individuals to whom questionnaires were mailed, 30 were ineligible for various reasons (illness, death, changed addresses, or simply returned unopened). Seventy-nine completed questionnaires were returned by 32 females and 47 males aged between 65 and 82 years. When respondents were compared with census data for the area from which the sample was drawn (52% males and 48% females) the respondent group contained a higher proportion of males (59%). In Table 2 a comparison of age and gender between responders and non-responders is shown. The age distribution of the respondents, however, was similar to that of the population from which it was drawn. More than half of the non-respondents were female and there was a lower rate of response among those aged 75 years or more. Sixty-one subjects agreed to participate in the follow-up interview.

Constipation

Almost a quarter (n = 18) of the subjects were constipated, five functionally, nine by self-report and four by self-report with functional symptoms. Table 3 shows the age range, gender, marital status and educational background of these subjects. An equal number of males and females reported constipation. The proportion appeared to be more for females than males but was not statistically significant. More subjects from the 65- to 69-year-age group reported constipation than did older subjects. Self-reported constipation appeared to be more associated with lower levels of education (maximum of four years’ post-primary schooling). The majority of participants reported being able to manage on their incomes reasonably well although two of the four people who were functionally constipated found it difficult to manage on their incomes.

Some subjects who were not classified as constipated reported experiencing at least one symptom associated with functional constipation. This was most often a feeling of incomplete evacuation. In subjects with functional

<table>
<thead>
<tr>
<th>Age and gender for respondents and non-respondents</th>
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<tbody>
<tr>
<td>Respondents</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Age (years)</td>
</tr>
<tr>
<td>65–74</td>
</tr>
<tr>
<td>75+</td>
</tr>
</tbody>
</table>

(a) One subject’s gender could not be determined.
constipation, the most frequently reported symptom was straining at stool, and this was the only symptom reported by those who self-reported constipation, whereas for those who self-reported and had functional constipation, all symptoms were almost equally experienced across the group.

Laxative use

Table 4 lists prescribed and over the counter laxatives taken by participants. Sixteen of 79 subjects used laxatives, and these were usually (n = 14) obtained over the counter at retail outlets. Five subjects were prescribed laxatives by their general practitioners and some participants were taking both prescribed and over the counter laxatives concurrently. Four of the five people who were functionally constipated were using over the counter laxatives and two of these were also using prescribed laxatives. There were two of the four people who were functionally constipated and also self-reported constipation, who also used the counter laxatives. Eight of the nine people who self-reported constipation but did not have symptoms of functional constipation took over the counter laxatives and three of these also used prescribed laxatives.

Of the 12 constipated subjects who were taking laxatives, seven used them at least once per week. Four subjects who were not constipated also reported taking laxatives on a regular basis.

Other medications

One third of subjects took aspirin. Twelve took between one and five adult tablets per week (two were functionally constipated and three self-reported constipation), three people took six to ten adult tablets per week (one functionally constipated and one self-reported) and one person took more than 15 adult tablets per week. This person was neither functionally constipated nor constipated by self-report. Sixty-three subjects (80%) were taking other medication such as diuretics, analgesics, non-steroidal anti-inflammatory drugs, anticholinergic agents and medication for hyperacidity.

Reported consumption of serves of cereals and cereals foods, vegetables, fruit and fluid

When cereals, vegetables and fruit food group consumption was analysed by constipation status, constipated subjects consumed significantly fewer serves of the cereals food group per day compared to those who were not constipated (2.9 and 3.5 serves, P = 0.03).

Tables 5 and 6 show the mean number of serves of cereals, vegetables and fruits consumed by males and females respectively, based on the 24-hour dietary recall. These were compared to grouped recommendations from the Australian Guide to Healthy Eating (21) for persons over 60 years of age and with data from the 1995 National Nutrition Survey (20) for persons over 65 years of age.

Female participants consumed the minimum recommended serves for cereals and fruit from the guide, whereas male participants only achieved this for fruit. The number of serves of cereals and vegetables eaten were

| Table 3. Demographic characteristics and constipation status of respondents (n = 79). Values are n |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|
| **Number of subjects**          | Functionally constipated | Self-reported    | Self-reported and functionally constipated | Not constipated |
| Gender                          |                  |                  |                  |                  |
| Males                           | 3                | 5                | 2                | 38              |
| Females                         | 2                | 4                | 2                | 23              |
| Age range (years)               |                  |                  |                  |                  |
| 65–74                           | 4                | 8                | 2                | 47              |
| 75–82                           | 1                | 1                | 2                | 14              |
| Marital status                  |                  |                  |                  |                  |
| Married/De facto                | 3                | 6                | 1                | 44              |
| Single(a)                       | 2                | 3                | 1                | 17              |
| Level of education/training(b)  |                  |                  |                  |                  |
| Tertiary                       | 3                | 1                | 3                | 23              |
| Matriculation                   | 1                | 1                | 0                | 5               |
| ≤ Year 10                       | 1                | 7                | 1                | 31              |

(a) Includes divorced, separated, widowed and never married.
(b) Level of education/training missing for 2 subjects.

| Table 4. Number of subjects using different types of laxatives |
|-----------------|-----------------|
| **Prescribed**  | **Over the counter** |
| Metumucil       | 0               | 2                |
| Senakot         | 0               | 2                |
| Durolax         | 0               | 4                |
| Agarol          | 1               | 3                |
| NuLax           | 0               | 2                |
| Coloxyl         | 2               | 0                |
| Alvacol         | 1               | 0                |
| Epsom Salts     | 0               | 1                |
| Golytely        | 1               | 0                |
Table 5. Mean daily consumption of serves of cereals, vegetables and fruits in constipated and not-constipated male subjects (n = daily)

<table>
<thead>
<tr>
<th>Number of serves</th>
<th>Cereals</th>
<th>Vegetables</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male subjects</td>
<td>3.6</td>
<td>3.4</td>
<td>2.2</td>
</tr>
<tr>
<td>Functionally constipated</td>
<td>3.2</td>
<td>3.8</td>
<td>2.5</td>
</tr>
<tr>
<td>Self-reported</td>
<td>3.5</td>
<td>3.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Self-reported and functionally constipated</td>
<td>3.8</td>
<td>3.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Not constipated subjects</td>
<td>3.5</td>
<td>3.5</td>
<td>2.2</td>
</tr>
<tr>
<td>National average(a)</td>
<td>2.6</td>
<td>3.3</td>
<td>1.1</td>
</tr>
<tr>
<td>Recommended(b)</td>
<td>4–9</td>
<td>4–7</td>
<td>2–3</td>
</tr>
</tbody>
</table>

(a) Calculated weighted average number of serves for males from the 1995 National Nutrition Survey. (20)
(b) Range of serves combined from Options A and B of Australian Guide to Healthy Eating for males. (21)

Dietary fibre intake ranged from 3.5 g to 48 g per day with a mean of 23 ± (SD) 8.8 g per day. The Australian national weighted average for males and females in this age group is approximately 22.5 g daily (19). There was no statistical difference between the mean dietary fibre intake of the constipated and not constipated subjects (21 g compared with 23.5 g). While not significantly different, marital status appeared to have some influence on dietary fibre intake with those who had a partner consuming a mean of 24 g of fibre compared to 18.9 g for those who lived by themselves (P = 0.17). The mean fibre intake per MJ of energy was 3.23 g.

Daily fluid intake, calculated from the 24-hour dietary recall data, ranged from 0.7 to 7.6 glasses (250 mL per glass). The mean number of glasses of fluid consumed by the whole group was 4.1 (n = 46). On average constipated subjects drank fewer glasses of fluid (3.7) than those who were not constipated (4.2), although this difference was not statistically significant. Males appeared to drink less glasses of fluid (3.7) compared to females (4.6) but the difference was not significant.

Table 6. Mean daily consumption of serves of cereals, vegetables and fruits in constipated and not-constipated female subjects (n = daily)

<table>
<thead>
<tr>
<th>Number of serves</th>
<th>Cereals</th>
<th>Vegetables</th>
<th>Fruit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female subjects</td>
<td>3.1</td>
<td>3.5</td>
<td>2.6</td>
</tr>
<tr>
<td>Functionally constipated</td>
<td>2.5</td>
<td>2.5</td>
<td>0.5</td>
</tr>
<tr>
<td>Self-reported</td>
<td>2.5</td>
<td>3.2</td>
<td>3.2</td>
</tr>
<tr>
<td>Self-reported and functionally constipated</td>
<td>3.3</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>Not constipated subjects</td>
<td>3.8</td>
<td>3.7</td>
<td>2.6</td>
</tr>
<tr>
<td>National average(a)</td>
<td>2</td>
<td>3.9</td>
<td>1.2</td>
</tr>
<tr>
<td>Recommended(b)</td>
<td>3–7</td>
<td>4–6</td>
<td>2–3</td>
</tr>
</tbody>
</table>

(a) Calculated weighted average number of serves for females from the 1995 National Nutrition Survey. (20)
(b) Range of serves combined from Options A and B of Australian Guide to Healthy Eating for females. (21)

The 24-hour dietary recall data were used to calculate energy, fluid and dietary fibre intake. The energy intake ranged from 2.7 to 14.9 MJ, with a mean of 7.4 ± (SD) 2.4 MJ. There was little difference between males (7.5 ± (SD) 2.4 MJ) and females (7.4 ± (SD) 2.6 MJ). The mean energy intake of those who were functionally constipated was 6.7 ± (SD) 1.9 MJ, the same as those who self-reported constipation (6.7 ± (SD) 0.7 MJ). However, the energy intake of individuals who self-reported and were also functionally constipated was higher at 7.3 ± (SD) 1.7 MJ, while those who were not constipated consumed a mean of 7.6 ± (SD) 2.6 MJ.

Perceptions of diet and likelihood of dietary change

Subjects were asked to rate their diet for fibre intake on a six-point scale ranging from ‘very low’ to ‘very high’. Most subjects believed their diet to be ‘high’ or ‘very high’ in fibre (n = 41) despite the number of serves of cereals consumed being significantly less (P = 0.03) than recommended by the Australian Guide to Healthy Eating.

When asked whether they would increase their intake of fruits and vegetables in the next six months, only eight of the not constipated, and two of the constipated, subjects were confident of increasing their fruit and vegetable consumption. Even fewer of the subjects believed they would increase their breads and cereals consumption. Fourteen stated they were confused by ‘the available dietary advice’ and did not know ‘what was good and what was bad to eat’.

Nutrient and fluid intake

The use of dietary supplements such as bran, psyllium husks and wheat germ was recorded as part of the food frequency questionnaire. Two people ate bran every morning, other supplements were used infrequently.

Discussion

The proportion of people with constipation among the respondents was similar to that reported in overseas populations (7,8,26). The sub-grouping of the constipated group was important for analysis as it provided a means of identifying those who were constipated but did not realise it (those who were functionally constipated but did not self-report), those who considered themselves constipated even though they did not meet the criteria of functional constipation and those who considered themselves to be constipated and also met the criteria for functional constipation. For those who are functionally constipated but do not self-report, there may be long term implications for bowel function or underlying physiological problems, whereas those who self-report but do not have functional constipation have been found in other studies to self-medicate with over the counter laxatives (8).
In this study, half of the constipated subjects had two or more symptoms of functional constipation, which is a higher proportion than has been previously reported by others (27). For example, a US study found only 2 to 3% of older people living at home experience the symptoms characteristic of functional constipation (28). However, a more recent study in Canada, using the Rome II criteria produced similar results (29) to the current study. Similarly, a study in NSW, by Byrzer et al. (6) reported prevalence rates ranging from 6 to 10%, although the authors did not use the complete set of symptoms required by the Rome criteria (30) in their definition of functional constipation. This demonstrates the difficulty of comparing results between different surveys when different definitions are applied and this issue needs clarification.

Five subjects in this study who had reported symptoms of functional constipation did not self-report being constipated. Straining and hard stools have been found to be most strongly associated with self-report of constipation. Straining and hard stools have been found to be characteristic of functional constipation (28). However, a more recent study in Canada, using the Rome II criteria (31) to characterise constipation and until these are identified appropriate strategies for management cannot be determined. Therefore, it is important to explore how this group of subjects defines or categorises their constipation.

It might be expected that people who currently consume laxatives would not experience the symptoms of constipation nor believe themselves to be constipated. However, the results showed that the majority of constipated subjects were taking laxatives on a regular basis. Five subjects in this study who had reported symptoms of functional constipation did not self-report being constipated. Straining and hard stools have been found to be most strongly associated with self-report of constipation (31) and we found that straining at stool was the only symptom identified by subjects who believed they were constipated yet failed to meet the criteria for functional constipation. It is possible that subjects who report constipation, in the absence of symptoms of functional constipation are using as yet unidentified indicators to characterise constipation and until these are identified appropriate strategies for management cannot be determined. Therefore, it is important to explore how this group of subjects defines or categorises their constipation.

Subjects were not confident that they would make the necessary changes to their diet in order to eat more vegetables and fruit. There appears to be even less chance of people increasing their intake of breads and cereals, with only six of 60 people who answered this question indicating they felt any degree of confidence in increasing the amount they currently ate. This finding accords with that of the National Nutrition Survey (20), which found that 90% and 98% of people over the age of 65 years expressed no desire to change their intake of fruits and vegetables or cereals, respectively. Adoption of the current recommendations for cereals and vegetables clearly

The mean intake of non-alcoholic fluids was almost half of the recommended number of glasses suggested by the Australian Guide to Healthy Eating. Both constipation and being male were associated with lower intakes of fluid in this study. However, the relationship between fluid intake and constipation remains unclear (7,33).

Energy intake for the sample was highly variable ranging from 2.7 MJ to 14.9 MJ; however, the mean intakes for males and females were within the expected ranges for the age group of the participants, although it was near the lower end of the range for males. Further study of actual diets over a longer period of time, would highlight the food groups that are substantially contributing to this energy intake. According to Nicholas et al. energy intake decreases with age, particularly from fibre-rich foods (22), and if this proves to be a consistent finding, it may not be possible for older people to meet the current recommended intakes.

Identifying factors that may be responsible for the low intake of cereals, fruits and vegetables is complicated. Knowledge about the link between diet and disease is high in most sectors of the Australian community (34). Nutrition knowledge does not predict dietary behaviour whereas perceptions about attributes of food in relation to a healthy diet appear to be good predictors (35). About one quarter of the subjects in this study indicated that they did not know what was ‘good’ or ‘bad’ to eat because of the large volume of dietary advice that is available. Most subjects considered their diet to be ‘high’ or ‘very high’ in fibre, even though their actual intake of fibre from cereals and vegetables was quite low. Whether this is due to a lack of knowledge of fibre-containing foods, the amount of fibre in foods, or the amount of fibre-rich foods that should be eaten is unclear as yet. Others have made similar observations (36). This may account for the number of participants who reported taking fibre supplements on a regular basis.

The number of serves of cereals, vegetables (including legumes) and fruit recommended by the Australian Guide to Healthy Eating is considerably higher than the national average for older Australians. In this study, most subjects whether constipated or not, did not consume sufficient cereals and vegetables, although they appeared to eat enough fruit compared to the recommendations in the guide. There was little difference in the reported intake of vegetables between constipated and not constipated subjects, however, cereal intake was higher in females who were not constipated, but this was not so for males. The mean cereal consumption for females met the minimum recommended amount for this age group, but males consumed less than recommended. When compared by bowel status it can be seen that cereal consumption for males and females who were functionally constipated was slightly lower than the minimum recommendations. This is of concern as the Dietary Guidelines for Older Australians (17) have recognised the cereals, breads and pasta food group as most important for the dietary management of constipation. In conjunction, it has been observed that older people tend to overestimate their intake of cereal products (33), and it is possible that the actual number of serves of cereals consumed by our subjects is lower than reported. Few people reported supplementing their diet with dietary fibre such as bran, wheat germ or psyllium husks.
requires more than a ‘marginal’ change to people’s diets and may not be practical, particularly when combined with the subjects’ belief that they are already consuming high amounts of fibre.

Conclusion

If the results from this study were confirmed in the general population then the prevalence of constipation and laxative use in Australia is high and consistent with that in similar societies overseas. As the population ages, constipation will become an increasingly important issue for health services. Dietary modification is currently the first line of management for constipation, with recommendations to increase the number of serves of cereals, fruits and vegetables. But unless the dietary recommendations are achievable they will not be effective in alleviating constipation. For many people, to achieve the increases required by the recommendations may require a major shift in food consumption patterns, probably at the expense of other foods. Current dietary recommendations for older Australians may be overly ambitious in terms of the quantities to be consumed.

References


27. O’Keefe E, Talley NJ, Zinmsreitl AR, Jacobsen SJ. Bowel disor
29. Pare P, Ferrazzi S, Thompson W, Irvine E, Rance L. An epidemiologi
30. Bytzer P, Howell S, Leemon M, Young L, Jones M, Talley N. Low socioeconomic class is a risk factor for upper and lower gastrointes
33. Savige GS, Wahlyquist ML, Lukito W, Hsu-Hage BHH, Wattanap
35. Nayga R, Capps O. Jr. US consumers’ perceptions of the impor
tance of following the US dietary guidelines. Food Policy 1999;24:553–64.
36. Williams C. Healthy eating: clarifying advice about fruit and vege