

# Lifestyle changes as a treatment of gastro-esophageal reflux disease: a survey of general practitioners in North Queensland, Australia

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**Background:** Gastroesophageal reflux disease (GERD) is a common disorder in developed countries, with the usual treatment being medication. Previously, lifestyle modification was the only treatment for GERD; however, its effectiveness has not been assessed.

**Methods:** All practicing general practitioner (GP) members of two Divisions of General Practice (n=193) in North Queensland, Australia, were surveyed in 2001 using a postal questionnaire to determine their views and practices relating to such treatment among adults with GERD.

**Results:** The response rate was 70.5%. Of those who responded, 17.6% recommended diet and postural advice as a first line of treatment, with postural advice (89.7%), avoid known precipitants (86.0%), reduce weight if overweight (79.4%), eat a low fat diet (45.6%), and stop smoking (17.6%) being the most common recommendations. Of the nine possible changes, the median number recommended was 3, interquartile range (IQR; 3, 4). Eighty-nine percent of GPs thought  $\geq 10\%$  of patients with GERD would benefit from lifestyle changes, but almost half thought  $\leq 10\%$  of patients would be prepared to change.

**Conclusion:** Most GPs thought lifestyle changes would be beneficial when treating GERD, but did not believe their patients would change. Most GPs recommended fewer than half the lifestyle changes their peers believed effective in treating GERD.

**Keywords:** GERD, lifestyle modification, general practitioners, beliefs, food, posture

## Introduction

Gastroesophageal reflux disease (GERD) is a common disorder in developed countries (Talley et al 1992; Locke et al 1997; Kennedy and Jones 2000). This disease is important not only because of the distress and pain it causes and the related expense of medication, but also because GERD is associated with the development of Barrett's esophagus, which is a risk factor for adenocarcinoma of the esophagus (Cohen and Parkham 1999). A recent Swedish population-based case control study of carcinomas of the esophagus and gastric cardia concluded that the relationship between GERD and adenocarcinoma of the esophagus is "probably causal", while the relationship between reflux and adenocarcinoma of the gastric cardia is "relatively weak" (Lagergren et al 1999). In addition, the incidence of adenocarcinoma of the esophagus is increasing in industrialized countries, with this increase being unrelated to changes in classification (Pera et al 1993; Botterweck et al 2000).

Prior to the introduction of the antisecretory drugs, lifestyle modification was the only treatment for GERD; however, the effectiveness of this treatment has not been assessed (Katelaris et al 2002). On reviewing the earlier literature, Kitchin and Castell (1991) concluded that although there were few well designed placebo-controlled

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trials, lifestyle modifications were effective in the treatment of GERD. In contrast, a more recent publication concluded that while appropriate for promoting general health, many of these lifestyle changes would not be of benefit in alleviating the symptoms of GERD (Galmiche et al 1998). In the most recent review of the literature, Meining and Classen (2000) again found a lack of availability of evidence-based data, but identified some lifestyle measures that could be recommended after considering both the pathophysiology and the scientific evidence.

Although lifestyle modification therapy is recommended in Australia (Katelaris et al 2002) and America (DeVault and Castell 1999) as an adjunct to antisecretory medication, the current usage and associated success rate are unknown. A German study of 918 medical practitioners found that, in addition to medication, these doctors provided recommendations about lifestyle treatment of GERD “despite the lack of scientific evidence” (Meining et al 2002).

A recent assessment of the clinical outcome of patients with GERD who attended a dietetic clinic for lifestyle modification for the treatment of GERD symptoms found a substantial improvement in symptoms and a reduction in the use of GERD medication (Nowak et al, unpub). The authors concluded that a more thorough investigation of lifestyle modification in the treatment of GERD is warranted.

This study was undertaken to document the beliefs and experiences relating to the effectiveness of lifestyle measures in the treatment of adults with GERD, among general practitioners (GPs) in North Queensland, Australia.

## Methods

### Participants

All practicing GP members of the Townsville Division of General Practice (TDGP,  $n=138$ ) and the Northern Rural Division of General Practice (NRDGP; now renamed North & West Queensland Primary Health Care,  $n=55$ ) were surveyed using a postal questionnaire. The Australian Divisions of General Practice is a professional body representing 120 local Divisions of General Practice throughout Australia. Membership categories include full membership (medical practitioners) and associate membership (allied health professionals). The majority of GPs in the region were members of the Division (81% of GPs in the TDGP and 67% of GPs in the NRDGP). Townsville is a provincial town with 130 000 inhabitants and has a large rural remote catchment area. The GPs in the NRDGP provide medical services for the adjacent

population of 119 000 living in rural and remote areas and covering 800 000 square kilometers.

### Questionnaire

The questionnaire contained 30 questions which sought information about the GPs, their practices, their patients, their treatment of patients with GERD, the lifestyle recommendations they made to their patients, their beliefs about the effectiveness of such treatment, and their opinions about their patients' willingness to make these changes. The questions were predominantly set-response questions, with a few open-ended questions. The questionnaire was pilot tested on 10 GPs from other states, but did not require further adjustment.

The demographic questions provided information about age, sex, country of birth, medical school attended, current work location (postcode), average number of patient consultations per week, and age profile of patients seen. The remaining questions were specific to GERD. “On average, approximately how many new adult patients with GERD do you see per week?” with response options: 0–5, 6–10, 11–20, >20. “What is your first line of treatment for these patients?” with response options: use antacids, diet and postural advice, refer for endoscopy, refer for specialist opinion, use  $H_2$  antagonists daily, use  $H_2$  antagonists as required (prn), use proton pump inhibitors daily, use proton pump inhibitors prn, or other – please specify. “Do you recommend any of these lifestyle changes to your patients with GERD?” with response options being yes/no for each of the following: avoid alcohol, avoid eating before lying down, avoid spicy food, eat a diet low in fat, elevate the head of the bed, lie on the right side not the left side, lie on the left side not the right side, reduce weight if overweight, and others – please specify. “What proportion of your adult patients with GERD do you think could significantly reduce the severity and frequency of their GERD symptoms by modifying their lifestyle?” with response options: 0%, 1%–10%, 11%–25%, 26%–50%, 51%–75%, >75%. “What proportion of your adult patients with GERD do you think are prepared to make these changes?” with response options: 0%, 1%–10%, 11%–25%, 26%–50%, 51%–75%, >75%. “Which of the following lifestyle changes do you think are effective treatments for GERD?” with response options: avoid alcohol, avoid eating before lying down, avoid spicy food, eat a diet low in fat, elevate the head of the bed, lie on the right side not the left side, reduce weight, none, and others – please specify. The final question sought any further

information by asking “Do you have any other comments about the treatment of GERD?”.

## Study procedure

After obtaining ethics approval from the James Cook University Ethics Committee and agreement from the Boards of Directors of the relevant Divisions of General Practice, the researchers received mailing lists of all members from the divisions. A two-page questionnaire, a cover letter explaining the purpose of the study, and a reply-paid envelope were mailed to the work addresses of the practicing GPs on the lists provided ( $n=193$ ). Reminder letters were posted to nonrespondents 3–4 weeks later, to increase the response rate. Participants were initially assigned identification (ID) numbers so that nonrespondents could be identified, thus reducing the need to inconvenience those who had already replied. However, to maintain confidentiality, only ID numbers were entered into the database. Data were entered using a data reading program (Remark Office OMR – 4.0, 1997, Principia Products Inc, West Chester, PA, USA).

## Statistical analysis

Standard bivariate statistical tests were used to investigate associations between the following: demographic characteristics of the participants (age, sex, urban or rural location, country of birth, country of medical training, number of patients seen per week, number of patients per week presenting with GERD for the first time, estimated age distribution of patients for each GP); reported first line of treatment for GERD; percentage of participants who recommended lifestyle changes to their patients with GERD; and percentage of patients with GERD who the GPs estimated would be prepared to make lifestyle changes. A score of recommended lifestyle changes was constructed by adding the advice about each of the following categories: posture, weight reduction, meal size, low fat diet, caffeine, smoking, exercise, avoidance of known precipitants, and reviewing medication. The score ranged from zero to nine. Similarly, a second score was constructed for the number of lifestyle changes these GPs believed were effective treatments for GERD, using the same categories.

Chi-square tests, nonparametric Wilcoxon tests, and Spearman rank correlation were used to investigate the associations between answers relating to the first line of treatment for GERD, lifestyle changes recommended, and estimated percentage of patients who could reduce severity

and frequency of GERD symptoms. Spearman rank correlation was used to assess the relationship between the number of lifestyle changes recommended and the belief in the effectiveness of these changes. Only statistically significant results ( $p<0.05$ ) were reported. Statistical analysis was undertaken using SPSS for Windows, release 6.3.

## Results

### Participants

Respondents included 100 GPs from the TDGP and 36 GPs from the NRDGP (response: 72.5% and 65.5%, respectively;  $p=0.3353$ ). Most respondents were male (55.6%), aged between 35 and 54 years (61.5%), and born in Australia (65.9%). Most (74.8%) trained in Australian medical schools, and 14.1% were trained in the United Kingdom.

Only 2.2% of respondents saw 20 or fewer patients per week, while 28.4% conducted more than 140 patient consultations per week. Forty-seven percent of participants reported that more than a quarter of their patients were aged between 40 and 64 years, and 29.5% reported that more than a quarter of their patients were aged at least 65 years. Most participants (87.2%) reported fewer than six initial consultations per week for GERD, while 12.8% reported 6–10 such consultations per week.

More rural (22.9%) than urban (9.2%) GPs reported seeing an average of 6–10 new adult patients with GERD per week ( $p=0.0376$ ), and more male (19.2%) than female (5.1%) GPs reported seeing an average of 6–10 new adult patients with GERD per week ( $p=0.0163$ ).

### Treatment of GERD

The following responses were provided to the question “What is your first line of treatment for GERD patients?”: use proton pump inhibitors daily (24.3%), diet and postural advice (17.6%), use  $H_2$  antagonists daily (17.6%), use antacids (9.6%), refer to endoscopy (6.6%), use  $H_2$  antagonists prn (5.9%), and use proton pump inhibitors prn (3.7%). In addition, 23 further comments were made about the initial treatment of GERD, with eight stating that treatment depends on severity of the disease, 12 referring to varying proton pump inhibitor and  $H_2$  antagonist regimens, and eight comments related to diet and postural advice in addition to other treatment regimens.

The number of recommended lifestyle changes increased with the number of lifestyle changes these GPs believed were effective in the treatment of GERD ( $p<0.0001$ ).

**Table 1** General practitioners' (n = 136) responses to the questions "Do you recommend any of these lifestyle changes to your patients with GERD?" and "Which of the following lifestyle changes do you think are effective treatments of GERD?"

Lifestyle change	Recommended to patients (%)	Effective treatments (%)	Agreement between answers to both questions <sup>a</sup> (%)
Avoid alcohol	71.3	75.0	77.2
Avoid eating before lying down	76.5	83.1	80.1
Avoid spicy food	59.6	58.1	80.9
Eat a diet low in fat	45.6	41.9	75.7
Elevate the head of the bed	72.1	66.2	69.1
Postural advice	11.0	10.3	86.0
Reduce weight, if overweight	79.4	90.4	77.2
Reduce meal size	7.4	6.6	
Avoid caffeine	7.4	3.7	
Stop smoking	17.6	11.8	
Review medication	6.6	1.5	
Exercise-related advice	8.8	7.4	
Avoid known precipitants	7.4	3.7	
Other food-related advice	6.6	2.9	

<sup>a</sup> Percentages refer to concordant answers given to both questions, ie, both answers "no" or both answers "yes"; the second part of the described lifestyle changes are results derived from the open-ended parts of the two questions and can, therefore, not be directly compared.

Agreement between the responses given to the questions "Do you recommend any of these lifestyle changes to your patients with GERD?" and "Which of the following lifestyle changes do you think are effective treatments of GERD?" was generally good. The greatest disagreement was found for "elevate head of bed" (69.1% of concordant answers) and "eat a diet low in fat" (75.7% of concordant answers) (Table 1). Collapsing responses to provide nine lifestyle changes gave the following results: 89.7% of participants provided postural advice (avoid eating before lying down, elevate the head of the bed, which side to lie on, avoid repeated bending, avoid heavy lifting and straining, avoid inverted positions); 86.0% recommended avoiding known precipitants and irritants (avoid known precipitants, avoid/reduce alcohol, avoid spicy food/hot chili, cucumber, full cream milk, gassy food such as soft drink, and acidic food such as tomato or citrus juice); 79.4% suggested losing weight if overweight; 45.6% suggested eating a low fat diet; 17.6% recommended reducing smoking; 8.8% gave exercise-related advice; 7.4% suggested reducing the sizes of meals; 7.4% recommended reducing caffeine intake; and 6.6% suggested a review of medication. A combined score

of these nine recommendations indicated that three participants (2.2%) did not recommend any lifestyle changes and one (0.7%) recommended all nine lifestyle changes, with a median of three (IQR 3, 4) recommended lifestyle changes. Similarly, the median score for beliefs in the effectiveness of these lifestyle changes was three (IQR 3, 4; range 0–7).

The only statistically significant associations between demographic characteristics and the first line of treatment for GERD were that GPs 55 years or older were more likely than younger GPs to give diet and postural advice as a first line of treatment (38.9% for  $\geq 55$  years, compared with 13.3% for 35–54 years, and 17.6% for  $\leq 35$  years;  $p=0.0360$ ). Younger GPs ( $<35$  years) recommended more lifestyle changes than older GPs (median combined score  $<35$  years = 4 [IQR 3, 5],  $>35$  years = 3 [IQR 3, 4];  $p=0.0132$ ). Almost all GPs felt that at least some of their GERD patients could significantly reduce the severity and frequency of symptoms by modifying their lifestyle. However, almost half of these GPs felt that fewer than 10% of their GERD patients would be prepared to make these changes (Table 2). Twice as many rural (30.6%) as urban (15.2%) GPs thought that more than a quarter of their GERD patients would be prepared to make lifestyle changes ( $p=0.0447$ ).

Additional comments were provided by 25.7% of participants to the open-ended question "Do you have any other comments about the treatment of GERD?". The majority of these comments related to the change in recommendations and easier access to proton pump inhibitors (25.7%), when a gastroscopy should be undertaken (17.1%), the role of *Helicobacter pylori* (11.4%), and general comments about lifestyle changes (11.4%). A

**Table 2** General practitioners' (n = 136) responses to the questions "What proportion of your adult patients with GERD do you think could significantly reduce the severity and frequency of their GERD symptoms by modifying their lifestyle?" and "What proportion of your adult patients with GERD do you think are prepared to make these changes?"

Patients (%)	Patients who could significantly reduce symptoms (%)	Patients who are prepared to make changes (%)
0	2.2	1.5
1–10	8.8	48.1
11–25	25.0	31.1
26–50	30.1	10.4
51–75	25.0	7.4
> 75	8.8	1.5



further four participants commented that they now see more patients or younger patients with GERD, or that GERD is a “disease of Western excess”.

## Discussion

The major findings of this survey were that although there are no conclusive data showing that lifestyle modifications are effective in treating GERD, the majority of these GPs believed that many of their patients would benefit from such changes. Almost all of these doctors also recommended some of these changes to their adult patients with GERD, with 17.6% using such advice as their first line of treatment for this disease. Older GPs were more likely than younger GPs to offer such advice, while younger GPs who offered such advice recommended more changes than their older counterparts. Only one participant recommended a change in every category considered by peers to be effective lifestyle treatment options.

As the response rate was high, the results of the survey should be representative of the GERD-related beliefs and behaviors of the GPs in this region. This high response rate was probably due to the fact that the questionnaires were locally developed within a local, active university department, short (two pages), and circulated under the auspices of the local Divisions of General Practice, as well as two of the investigators being well known, local, practicing GPs. We have previously had similar response rates to short questionnaires from medical practitioners in the region (Harrison et al 2002).

The major limitation of the study was that the recommendations for treatment of GERD changed between the initial and reminder “mail outs” (Digestive Health Foundation 2001). This change in recommendations resulted in increased access to subsidized proton pump inhibitors, without the need for prior gastroscopy. It is certainly possible that this change influenced the results of the survey in terms of the “first line of treatment” for GERD. In addition, while a number of common lifestyle recommendations were specifically listed, recommendations about smoking, caffeine intake, review of medication, and eating smaller meals more often were included in the open-ended responses, thus making it difficult to determine the real frequency of these recommendations and beliefs.

Obesity, a past history of smoking, regular consumption of more than seven drinks per week, and a higher psychosomatic symptom checklist score were all found to be risk factors for GERD in a large American population-

based study (Locke et al 1997). However, it is not known whether removing these risk factors provides effective treatment for this disease. Similarly, while lifestyle modifications recommended for treatment of this disease are based on sound physiological principles (Kitchin and Castell 1991), to date there are no definitive studies showing their effectiveness.

A number of small studies have examined some of these lifestyle treatments with varying results. For example, while some studies have shown weight loss to be an effective treatment (Fraser-Moodie et al 1999; Mathus-Vliegen and Tytgat 2002), others have not (Kjellin et al 1996), and although some authors have reported that coffee increases the episodes of reflux (Pehl et al 1997), others have found that coffee has no effect on symptoms (Boekema et al 1999). A recent review of the literature suggested that there were reasonable grounds to support the inclusion of recommendations to avoid carbonated beverages, avoid large meals, lose weight, stop smoking, and sleep on the left side (Meining and Classen 2000). However, the evidence for the effectiveness of other lifestyle measures was inconclusive.

Just as Katz (2001) and a group of GPs from Germany (Meining et al 2002) reported advising their patients with GERD about lifestyle treatments for GERD, so did the majority of these GPs. Such methods are often recommended for treatment of mild symptoms (Goyal 2000) or as an adjunct to antisecretory medication (DeVault and Castell 1999; Katelaris et al 2002) even though the benefits of this treatment remain untested (Katz 2001). The two most common recommendations were to reduce weight if overweight and avoid eating before lying down, with more than three-quarters of respondents recommending each of these changes. These are commonly held views that are contained in most of the published lifestyle modifications suggested for the relief of symptoms of GERD (Zeman 1983; DeVault and Castell 1999; Goyal 2000; Katz 2001; Katelaris et al 2002). However, to date there is no consensus in the scientific literature about the effectiveness of either of these changes, which are both considered to have a predominantly mechanical basis.

Elevating the head of the bed (also based on a mechanical rationale) was a common recommendation, with 72% of the GPs making this recommendation. However, fewer GPs were convinced that this was an effective treatment; hence the concordance between beliefs about this treatment mode and recommending it to patients was lower than for any other recommendation. It is possible that the lower

concordance was due to the experience of the GPs, either because they have not found it to be clinically useful or because they have found that their patients tend not to follow such advice because it is impractical.

The majority of GPs in this survey considered that lifestyle changes would be beneficial in the treatment of GERD, but fewer believed that their patients would be prepared to make the required changes. Most GPs recommended fewer than half the lifestyle changes their peers believed were effective in the treatment of GERD. The lifestyle changes that these GPs believed to be effective treatments were similar to recommendations cited in the medical literature (DeVault and Castell 1999; Katelaris et al 2002) and in dietetic textbooks (Zeman 1983). If these lifestyle changes are found to provide effective treatment for this disease in a systematic, well designed intervention study, a considerable proportion of adults with GERD may not require long-term antisecretory medication. Instead, their symptoms may be relieved using lifestyle modification together with intermittent or occasional medication, resulting in reduced dependency on medication for the patients and substantial economic benefits for both the patient and the community.

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