

An old dietary regimen as a new lifestyle change for Gastro esophageal reflux disease: A pilot study

Mohammad Akram Randhawa^{1*}, Salah Al-Din Mahmoud Mahfouz²,
Noor Ahmed Selim², Taley Yar³ and Anton Gillessen⁴

¹Center for Research and Consultation Studies, University of Dammam, Dammam, Saudi Arabia

²Endoscopy Department, King Faisal Hospital, Taif, Saudi Arabia

³Department of Physiology, College of Medicine, University of Dammam, Dammam, Saudi Arabia

⁴Department of Internal Medicine, Sacred Heart Hospital, Muenster, Germany

Abstract: Treatment of gastro esophageal reflux disease (GERD) is becoming a challenge for medical profession. Proton pump inhibitors (PPIs) are commonly recommended but many disadvantages of these drugs are being reported, particularly when used for long term. Transient lower esophageal sphincter relaxations (TLESRs) are important cause of acid reflux. Gastric distention in upper stomach is the strongest stimulus for generation of TLESRs and is aggravated by intake of food in between meals. In an earlier cases report, two meals a day with intake of only fluids in between was suggested as a remedy for GERD. Present pilot study was conducted on 20 patients with endoscopically proven reflux esophagitis (Los Angeles Grade a, b or c), who followed our advice to take meal twice a day with consumption of only soft drinks (fruit juices, tea, coffee, water, etc) in between and no medication for two weeks. On 14th day 15 patients (75%) were free of reflux symptoms, 2 (10%) had partial improvement and 3 (15%) reported no difference. It is concluded that two meals a day with intake of only fluids in between, whenever the patient feels hungry or thirsty, is a useful dietary regimen for the management of GERD. Further investigations are needed to confirm the benefits of this physiological lifestyle change.

Keywords: GERD, pathophysiology, new lifestyle change, two meals a day, fluids in between.

INTRODUCTION

Gastro esophageal reflux disease (GERD) is a very common disorder worldwide and becoming a challenge for the medical profession. A review of thirteen studies reported that the population prevalence of GERD ranged from 2.5% to 6.7% in Eastern Asia (Wong and Kinoshita, 2006). In one survey of an urban population in Pakistan the frequency of gastro esophageal reflux symptoms was 24% (Jafri *et al.*, 2005). According to a recent study in Japan, amongst many lifestyle-related factors correlated with GERD symptoms, poor quality of sleep and irregular dietary habits were strong risk factors for high FSSG (Frequency Scale for the Symptoms of GERD) scores and the usual doses of Proton Pump Inhibitors (PPIs) or Histamine H₂ Receptor Antagonists (H₂RA) could not fully relieve GERD symptoms (Yamamichi *et al.*, 2012). In Saudi Arabia also an increasing prevalence of GERD (from 5% to 15% over the last ten years) was attributed to changes in lifestyle and dietary habits such as increased consumption of fat and fast food, obesity and smoking (Al-Humayed *et al.*, 2010).

PPIs are generally considered safe; however, both long term and short term PPI use were linked to a higher risk of serious infections, such as diarrhea caused by the *C. difficile* bacterium, as well as community-acquired pneumonia (Kim *et al.*, 2012). Multiple daily-dose or

long-term usage of PPIs were linked to a higher risk of osteoporosis-related fractures of the spine, wrist or hip. PPIs may also lower serum magnesium and can increase the risk of cardiac arrhythmias. Discontinuation of PPIs after prolonged therapy was reported to result in a rebound increase in acid production (Reimer *et al.*, 2009; Vakil, 2012). Recently, it has been suggested that the PPIs should have black-box warnings (MediLexicon International UK, 2011).

Transient lower esophageal sphincter relaxations (TLESRs) immediately precede reflux episodes and are considered as important cause of acid reflux. Gastric distention particularly below cardia is the strongest stimulus for the generation of TLESRs and plays an important role in postprandial reflux events. The gastric distention is aggravated, particularly in cardiac end, with intake of food when the stomach already contains food and thus increases the possibility of reflux (Hershovici *et al.*, 2011; Plan *et al.*, 2011).

Considering the strong association of irregular dietary habits and GERD as well as the pathophysiological mechanisms causing acid reflux with the intake of meal on top of a meal, it is suggested that increasing the interval between meals (i.e. taking two meals a day) and the consumption of only soft drinks in the intervening interval will reduce episodes of reflux. In an earlier cases report, the idea was applied on 4 patients with

*Corresponding author: e-mail: mrakramsa@yahoo.com

endoscopically/clinically diagnosed reflux esophagitis. A decrease in the intensity of pain started at day 3-5 in all cases and these patients became symptom free in 7-10 days. (Randhawa *et al.*, 2013). In the present study, the hypothesis was tested on 20 patients, as a pilot study, with encouraging results.

METHODS

Patients

Patients were randomly selected from outpatients reporting with typical acid reflux symptoms at the gastroenterology units of Sacred Heart Hospital, Muenster, Germany and King Faisal Hospital, Taif, Saudi Arabia. Those who consented to take our dietary regimen and refrain from any medication during the study period were included. Permission for the pilot study was obtained from the ethical committees of respective hospitals.

Inclusion criteria

(a) GERD symptoms (Epigastric pain or heartburn with vomiting, cough or sore throat). (b) Endoscopically proven reflux oesophagitis, Los Angeles grade (LA grade) a, b, or c. (c) Willing to take two meals a day and only soft drinks (fruit juices, tea, water etc.) whenever they felt hungry or thirsty in between the meals. (d) No PPIs or H₂RA medication during the study period.

Exclusion criteria

(a) *H. pylori* positive. (b) Peptic ulcer. (c). Withdrawal from the study could either be because of an increase in the intensity of pain or patients' wish to discontinue

Study design

Patients who fulfilled the above-mentioned criteria, i.e. agreed to take our dietary regimen and avoid any medication during the study period, were requested to report after two weeks. On 14th day, the patients were contacted to ensure compliance on study criteria and for the evaluation of pain, heartburn and other reflux symptoms during the last two weeks.

RESULTS

Twenty patients continued our suggested meal regimen for two weeks. They were aged between 15 and 68 years; 11 (55%) were females and 9 (45%) males; and belonged to Saudi Arabia, 10 (50%), Germany, 9 (45%) and Pakistan 1 (5%), working in Saudi Arabia. They suffered from GERD LA grade a, 10 (50%); b, 6 (30%); or c, 4 (20%). On day 14th 15 were free of pain, heartburn or other reflux symptoms, 2 had partial improvement and 3 reported no difference. The detail of demographic data, distribution of GERD grades and response to treatment is given in Table 1. Percentile distribution of GERD grades and response to treatment is summarized in table 2. From

those suffering from GERD LA grade a, all improved except one (90% improvement), from grade b all improved (100% improvement) and out of grade c two had partial improvement and two said no difference (50% improvement). Those who did not respond well were advised to take omeprazole or ranitidine for further treatment.

DISCUSSION

Irregular dietary habits, increased intake of fat and obesity are reported to possess a strong association with GERD (Jafri *et al.*, 2005; Wong and Kinoshita, 2006; Al-Humayed *et al.*, 2010; Yamamichi *et al.*, 2012). It is anticipated that ingesting a meal on top of partially or completely full stomach is likely to inhibit the release of somatostatin by buffering the acid in the stomach. This would lead to a decrease in the inhibitory effect of somatostatin on G-cells and ECL-cells, resulting into another surge in the acid secretion. The intake of food in between meals also causes gastric distention in the upper stomach which is the strongest stimulus for generation of TLESRs (Hershcovici *et al.*, 2011; Janssen *et al.*, 2011; Plan *et al.*, 2011).). Thus, hyperacidity, increased pressure in the upper stomach and TLESRs because of irregular dietary habits, particularly taking a meal on top of a meal, favour acid reflux.

During the inter-digestive phase (the fasting state) the distal stomach is engaged in a recurrent contraction pattern known as migrating myoelectric complex (MMC). MMC serves to clear the stomach of secretions, debris, and microbes during fasting (Janssen *et al.*, 2011). Irregular dietary habits, i.e. a meal on top of a previous meal, would affect these propulsive movements, delay the gastric emptying and favor reflux (Janssen *et al.*, 2011). Moreover, physical nature of food remains crucial in regulating emptying rate. After a liquid meal the gastric emptying begins instantly and emptying half-life is about 30 min. In contrast, after a solid meal, the linear emptying occurs after a lag phase and the emptying half-life is about 2 hours (Camilleri *et al.*, 1985; Kong and Singh, 2008). Therefore, meal on top of a meal, particularly solid meal, is more likely to delay gastric emptying and promote reflux.

A systematic review (Kaltenbach *et al.*, 2006) evaluated the effect of dietary and other lifestyle modifications on lower esophageal sphincter pressure, esophageal pH, and GERD symptoms and it was reported that the consumption of tobacco, chocolate and carbonated beverages were shown to lower pressure of the lower esophageal sphincter (LES), thus could cause reflux. However, contrary to that, a recent systematic review concluded that there was lack of evidence that consumption of carbonated beverages causes or provokes GERD (Johnson *et al.*, 2010). Furthermore, there have

Table 1: Data and results of 20 cases of GERD who took two meals a day with soft drinks in between for 2 weeks. Showing: gender [males=9 (45%), females=11 (55%)]; ages (15-68 years); nationality [Saudis=10 (50%), Germans=9 (45%), Pakistani=1 (5%), working in Saudi Arabia]; frequency of LA grades [a=10 (50%), b=6 (30%), c=4 (20%)] and response [improved=15 (75%), partial improvement =2 (10%), no improvement 3 (15%).

S No	Gender	Age	Nationality	LA grade	Improvement
1	F	47	S	b	i
2	F	38	S	a	i
3	F	15	S	a	n
4	F	45	S	c	p
5	F	55	S	a	i
6	M	48	S	b	i
7	F	63	S	c	n
8	M	44	S	b	i
9	M	50	S	a	i
10	M	60	S	c	p
11	M	52	G	a	i
12	M	30	G	b	i
13	F	49	G	a	i
14	F	35	G	b	i
15	F	68	G	a	i
16	F	54	G	b	i
17	M	50	G	c	n
18	M	51	G	a	i
19	F	48	G	a	i
20	M	56	P	a	i

Table 2: Summary of the results of 20 cases of GERD who took two the suggested meal regimen, showing frequency of LA grades and overall response rate

LA grade			Overall response		
a	10	50%	Improved	15	75%
b	6	30%	Partial improvement	2	10%
c	4	20%	No Improvement	3	15%
Total	20	100	Total	20	100

been no studies conducted to date that have shown clinical improvement in GERD symptoms or complications associated with cessation of coffee, caffeine, chocolate, spicy foods, citrus, carbonated beverages, fatty foods, or mint. Therefore, elimination of food or drinks that could trigger reflux, like chocolates or carbonated drinks could be conditionally recommended (Katz *et al.*, 2013). From these controversial reports and incomplete evidences related to the dietary modifications for GERD, as well as from the results of the present study, it can be anticipated that the time period between meals is of primary importance than the type of drinks consumed in the intervening period.

The results of the present pilot study demonstrate the beneficial effects of two meals a day in 95% of patients having GERD LA grade ‘a’ and ‘b’. Whereas, 50% of patients with LA grade ‘c’ also showed partial improvement. Those who did not respond well were advised to take omeprazole or ranitidine. It is anticipated

that once they improve with medication and continue to take the suggested meal regimen the recurrence rate of GERD will decline. Rebound hyperacidity and high recurrence rates are well known with discontinuation of PPIs (Reimer *et al.*, 2009). Further investigations with larger number of patients and prolonged follow up are needed to confirm the benefits of this physiological lifestyle change.

The suggestion of two meals a day and only fluids in between is related to the advice by Luqman the Wise (1100 BC) to his son:

وقال لقمان لابنه : يا بني لا تأكل شبعاً فوق شبع ، فإنك أن تنبذه للكلب خير من أن تأكله

Translation: Luqman (Allah be pleased from him) said to his son, ‘Oh my son, do not eat anything after you have taken to your satisfaction. If you leave it for a dog is better than you eat it’.

Which is mentioned in Tafsir (explication) Al-Qortoby in the explanation of Aya (Verse) 31, Sura (Chapter) 7 of Qoran (Al-Qortobi, 2006):

وَكُلُوا وَاشْرَبُوا وَلَا تُسْرِفُوا ۗ إِنَّهُ لَا يُحِبُّ الْمُسْرِفِينَ

Meaning: "And you eat and drink but do not waste, He (Allah) loves not the wasters".

On the basis of the pathophysiological factors mentioned above and the results of our study, it is suggested that an increase in the interval between meals and intake of fluids only during the intervening period will decrease reflux episodes in many ways: a) prevent undue increase in the acidity provoked by a meal on top of a meal, b) reduce the development of TLESRs triggered by over distension of stomach subsequent to another meal, c) favour gastric emptying by promoting MMC during fasting and d) ensure regularity of dietary habits. Therefore, the suggestion of taking two meals a day and consuming only liquids in between, whenever the person feels hungry or thirsty, would benefit the patient in a way similar to the action of an antacid or an antisecretory drug, combined with a prokinetic agent.

CONCLUSIONS

Results of the pilot study support the hypothesis that two meals a day and only soft drinks in between is an effective lifestyle change for the management of GERD. Further investigations are needed to confirm the benefits of this old but a physiological dietary habit.

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