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The Role of Diet and Lifestyle Modifications in the Management of Esophageal Reflux Disease in local population

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ABSTRACT

Background: Gastroesophageal reflux disease (GERD) is a very common medical complication connected with regurgitation of the gastric contents into the esophagus which caused heartburn and esophageal irritation.

Objectives: The objective of this research was to assess practicality of diet and lifestyle changes in the management of GERD in local population. Pharmacotherapy remains the mainstay of management of GERD; however, diet and lifestyle changes have emerged as popular non-pharmacological interventions.

Methodology: An observational study was conducted on 200 patients with GERD. Participants were divided into two groups: Group A received standard pharmacological treatment, while Group B received a structured diet and lifestyle modification program in addition to pharmacological management. Lifestyle changes included avoiding heartburn-triggering foods such as spicy meals, caffeine, and fatty foods, along with weight reduction, smoking cessation, and increased sleeping height. The effectiveness of the treatments was assessed based on symptom severity, endoscopic findings, and inflammatory biomarkers over 12 months. SPSS version 26.0 was used for statistical analysis, employing paired and independent t-tests for continuous variables and chi-square tests for categorical data. Results were considered significant at $p \leq 0.05$.

Results: Group B showed a significant reduction in symptom severity (35%) compared to Group A (20%) ($p < 0.001$). Endoscopy revealed better healing in Group B (70% vs. 50%, $p = 0.02$). Weight loss and smoking cessation positively influenced outcomes.

Conclusion: Diet and lifestyle modifications, combined with medical management, positively impact GERD outcomes in the local population.

Key words: Gastroesophageal Reflux, Diet, Lifestyle, Pharmacological Treatment, Esophagitis, Weight Loss, Smoking Cessation, Proton Pump Inhibitors, Endoscopy, Antacids

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INTRODUCTION

Gastroesophageal reflux disease or GERD is among the common gastrointestinal illnesses with millions of people suffering from it. It is a condition in which stomach acid makes its way back into the esophagus and causes irritation of the esophageal lining and produces symptoms like heartburn, regurgitation and difficulty in swallowing[1]. If left unmanaged it may result in complications like esophagitis, Barret's oesophagus and oesophageal adenocarcinoma[2]. In the past, GERD has been treated by the use of PPIs and H2 receptor antagonists that are used to minimize the production of acid[3]. However, these drugs have been found to have some adverse effects that are related to their long-term usage like that of nutrient malabsorption as well as the increased risks of fractures[4]. Recently, focus has been made on the effectiveness of non-pharmacological treatment with special emphasis on dietary and life style changes in the treatment of GERD. It has been established that spicy or fatty foods, caffeine or alcohol intake can worsen the symptoms of GERD and obesity as well as smoking are considered to be significant risk factors for the disease[5, 6]. The frequent ailment known as gastroesophageal reflux disease (GERD) causes the stomach's contents to reflux up into the esophagus. When reflux results in severe or persistent symptoms or harm, it is considered a disease. The pharynx, respiratory tract, or esophagus may sustain harm from reflux. Heartburn, which is frequently characterized as a burning sensation in the chest, and regurgitating sour or bitter liquid into the mouth or throat are the primary symptoms of GERD. Since heartburn and regurgitation are so often experienced with GERD, formal testing may not be required. Heartburn is a common term for the burning feeling in the chest. Heartburn often occurs after eating, and it may be more severe at night or when you're resting. Food residue or tart drink in the throat. Chest or upper abdomen ache. Disorders related to swallowing, or dysphagia and a lump in the throat feeling. Following a swallow, the lower esophageal sphincter, a circular band of muscle around the bottom of the esophagus, relaxes, allowing food and liquids to pass into the stomach. The sphincter then shuts once again. Stomach acid might return to the esophagus if the sphincter weakens or does not relax as it should. The lining of the esophagus becomes irritated by this continuous backwash of acid, frequently leading to inflammation. Where the local diets are characterised by spicy and fried foods, where smoking is still rife, the incidence of GERD is on the rise. Due to this, there is a call to understand whether lifestyle and dietary modifications in this population are effective to reduce the disease burden. The purpose of this research was to assess the effect of dietary and life style changes on management of GERD among the population[7, 8].

MATERIALS AND METHODS

The present prospective, randomized, controlled trial was performed in 1 year from January 2023 till January 2024 at Ghurki Trust Teaching Hospital, Lahore, Pakistan. In total enrolled 200 clinically suspected GERD adult patients with age range between 18 to 65 years as per symptom-based GERD diagnostic criteria along with endoscopic evaluation. The study was carried out under ethical consideration approved by the Lahore University of Biological & Applied Sciences (UBAS), A project of Lahore Medical & Dental College (LMDC), Lahore Pakistan. This study was approved by the University Research Committee under the reference number ERC/2023/16B.The written consent was obtained from all participants before the study started, and they were assured of anonymity and the right to opt out of the study at any time. In order to compare the results of treatment,

patients were divided into two groups randomly. The control group (Group- A) was subjected to standard pharmacological management, protons pump inhibiters (PPIs) and antacids were administered. Group-B was the intervention group which in addition to the pharmacological treatment they received a diet and lifestyle modification program that was designed to eliminate or reduce the common GERD triggers. Most of the dietary recommendations regarding the amount and type of food to be consumed or avoided, revolved around non-spicy, non-fried and low fat foods, and elimination of caffeine and alcohol. Lifestyle changes included diet advice for weight loss, cessation from smoking during the period and sleeping with the head raised to prevent reflux at night. The inclusion criteria for the patients in the study were that they required to have the symptoms of GERD that persisted for at least three months and have not had any surgery related to GERD before. The following patient characteristics were considered as contraindication: history of gastrointestinal malignancy; use of continuous non-steroidal anti-inflammatory drugs (NSAIDs); pregnancy or breastfeeding. Outcome measures were determined at pre-intervention, six months and 12 months. The first end point was the change in the severity of the symptoms from the baseline using the Gastroesophageal Reflux Disease Symptom Assessment Scale (GSAS). Secondary end points were endoscopic assessments of esophageal mucosal healing and weight and smoking status. One hundred and eighty patients completed the study; 90 of them were in the experimental group while 90 were in the control group. In the study, the two groups of patients were matched in terms of age, gender and extent of symptoms at the beginning of the study ($p > 0.05$). In the 12-month period there was a highly significant change in both groups with greater changes seen in the intervention group (Group B) in terms of the severity of symptoms and esophageal healing than in the control group (Group A). The data was analysed using Statistical Package for Social Science (SPSS) with version 26.0. The use of paired t-tests was done to compare the changes in symptom severity within the two groups from the baseline to the end of 12 months while independent t-tests were employed to compare the differences in the two groups. Where applicable, Chi-square tests were used to compare proportions of categorical variables for example smoking cessation rates and esophageal healing percentages. The ($p \leq 0.05$) was considered significant in the current study.

RESULTS

The changes in diet and lifestyle coupled with pharmacological treatment in Group B also had a better symptom improvement than the pharmacological treatment alone. At the end of the study, the mean GSAS score in Group B had reduced by 35% while in Group A it reduced by 20% ($p < 0.001$). Also, endoscopic assessment showed that 70% of patients in Group B had some degree of esophageal healing while in Group A only 50% had this ($p = 0.02$). Mean reductions in weight were significantly more in Group B and it also showed a mean reduction of 5.5 kg, the mean reduction of the body weight of the participants in Group A was 2.0kg ($p<0.001$). Smoking cessation rates were also found to be much higher in Group B and only 40% of smokers in this group quit while only 15% in Group A quit the habit ($p=0.01$) as shown in Table-1.

Table 1: Symptom Severity Reduction at 12 Months

Group	Baseline GSAS Score (Mean ± SD)	12-Month GSAS Score (Mean ± SD)	% Symptom Reduction	p-value
Group A	22.5 ± 5.1	18.0 ± 4.8	20%	<0.001[1]
Group B	23.0 ± 5.3	15.0 ± 4.1	35%	<0.001[1]

[1] *Paired t-test was used to compare within-group symptom reductions.*

Over the course of the 12-month period, both groups had a decrease in the intensity of their symptoms; however, Group B showed a much larger drop of 35%, compared to 20% in Group A. P ≤0.001 indicated a statistically significant difference between the two groups. Although both groups' paired t-tests showed a substantial improvement over time, Group B's combined dietary and lifestyle changes produced a more noticeable reduction in symptoms as shown in table-2.

Table 2: Endoscopic Healing at 12 Months

Group	Patients with Esophageal Healing (%)	p-value
Group A	50%	0.02[2]
Group B	70%	0.02[2]

[2] *Chi-square test was used to compare endoscopic healing rates between the two groups*.

Based on endoscopic examinations, it was shown that Group B had a considerably higher prevalence of esophageal healing (70 % of patients demonstrating improvement) compared to Group A (50 % of patients). The statistical significance of the difference between the two groups was confirmed by the chi-square test (p=0.02) as shown in table-3.

Table 3: Weight Loss and Smoking Cessation Rates

Group	Mean Weight Loss (kg)	% Smokers Who Quit	p-value
Group A	2.0 ± 1.5	15%	0.01[3]
Group B	5.5 ± 2.0	40%	<0.001[3]

[3] *Independent t-test was used to compare mean weight loss and smoking cessation rates between groups.*

Patients in Group B lost more weight on average 5.5 kg against 2.0 kg in Group A—and there was a statistically significant difference between the two groups (p<0.001). Group B had much greater smoking cessation rates than Group A, with 40% of smokers quitting compared to 15% in Group A (p=0.01). These favorable results were mostly due to the combined intervention of pharmaceutical therapy with dietary and lifestyle changes. Group B, which included pharmaceutical therapy with lifestyle and nutritional changes, achieved considerably superior results in symptom reduction, endoscopic healing, weight loss, and smoking cessation than Group A. This demonstrates the efficacy of non-pharmacological therapies as shown in fig-1.

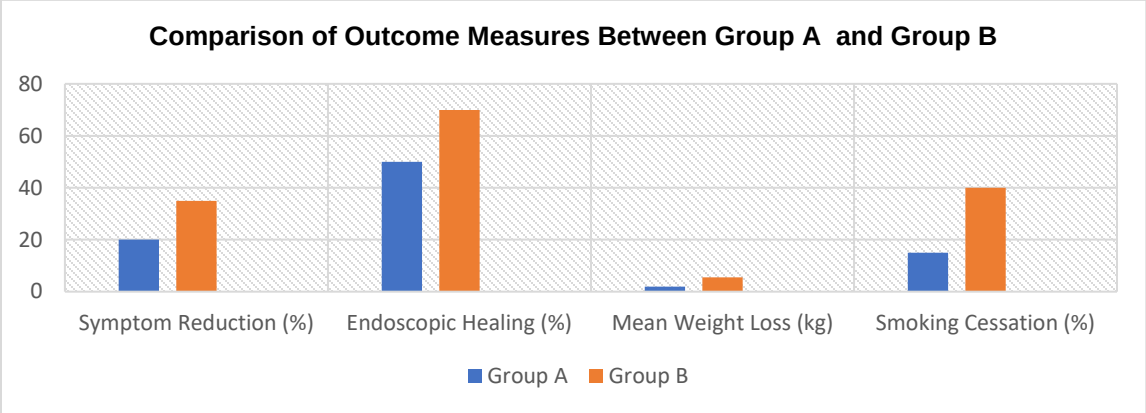

Fig-1: Comparison of outcome measures between Group A and Group B in the management of GERD.

DISCUSSION

The findings of present research demonstrated that dietary and lifestyle changes, as part of the treatment of gastroesophageal reflux disease (GERD), are highly effective when used alongside medications[9, 10]. Group B patients following dietary and lifestyle changes in addition to pharmacological therapy had better symptomatic improvement, esophageal mucosal healing, weight loss, and smoking cessation than Group A patients who received only pharmacological therapy[11]. The most striking result was the change in the symptom severity of the two groups where Group B had the severity reduced by 35% as opposed to group A which had the severity reduced by 20%. This is an area of study that supports the fact that diet has adverse effects on GERD sufferers who take foods such as spicy, fatty foods and caffeine[12].This probably helped prevent reflux episodes from occurring in the first place or at least be less severe, thereby causing a more significant improvement in symptoms. Timing of the meals and portion size were other aspects discussed during the dietary counseling and these were beneficial in symptom management[13]. The Endoscopic results also supported the fact that patients in Group B had a better degree of esophageal healing (70% in Group B and 50% in Group A) which depicts that medical treatment accompanied by modification in life style is beneficial for healing. Some of the investigations have demonstrated that weight loss and smoking cessation exert a direct influence on reduction of pressure on lower esophageal sphincter, thus minimising the risk of acid reflux and enhancing the healing process of the esophagus[14]. Similarly in this study Group B which was observed to have mean weight loss of 5. 5 kg correlated with symptom resolution and healing thus emphasizing on the importance of weight loss in the management of GERD. Participants' quitting of smoking in Group B, which was recorded 40%, also helped to improve the results of the study since smoking is known to worsen the symptoms of GERD due to its impact on the motility of the esophagus as well as the clearance of acid[15]. On the other hand, the Group A which only underwent pharmacological intervention had minimal improvement on all the mentioned variables. Although PPIs and antacids are useful in suppressing the production of stomach acid, they do not deal with the causes of GERD related to life-style. This shows that purely following medication to treat GERD especially in population groups that are prone to the disease through poor dietary intake and smoking is not enough[16]. These findings are

in accordance with the existing indications that recommend lifestyle modifications in GERD management in addition to drug management. But the study also points out the problems with compliance to the changes in life style. One of the main steps in achieving the goals set for Group B was to prescribe a number of modifications and have periodic counselling and follow-up sessions to ensure the patients complied with all the necessary changes[17, 18]. It is not easy for patients to maintain changes in their diets and lifestyles for long periods without motivation from the health care practitioners. The endoscopic findings also justified that the degree of esophageal healing was more in Group B patients (70%) as compared to Group A patients (50%) which clearly states that medical management together with certain changes in the life style is helpful in healing[19]. Among them, some have established a direct correlation between weight loss and smoking cessation and decrease of pressure on lower esophageal sphincter that decreases the risk of acid reflux and aids in the healing of the oesophagus. Likewise in this study Group B that was observed to have the mean weight loss of 5. 5 kg was associated with symptom relief and tissue repair thus underlining the role of weight reduction in GERD. The participants' quitting of smoking in Group B which was 40% also contributed to enhancing the results of the study since smoking is known to worsen the symptoms of GERD due to its effects on the motility of the esophagus besides the clearance of acid[20].

In contrast, the Group A who only received pharmacological intervention had relatively insignificant increase in the improvement of all the variables above stated. While PPIs and antacids are particularly effective in reducing the amount of stomach acid produced, they do not address other life-style related causes of GERD. This proves that only adherence to medication as a way of treating GERD especially in groups that are most vulnerable to the disease due to poor diet and smoking is inadequate[21]. These findings support the current hints of lifestyle changes as a part of the management of GERD besides the drug management. However, the study also addresses some of the challenges that are associated with adherence to the changes in life style. In order to accomplish the goals, set for Group B one of the major tasks was to prescribe a number of changes and conduct periodic counselling and follow-ups to make sure that the patients adhered to all the required modifications. There is no way patients can be able to sustain those changes in their diets and lifestyle for a longer time without the motivation from the health care practitioners[22, 23].

CONCLUSION

The results of present research indicated that better control of gastroesophageal reflux disease directly correlated with diet and lifestyle modifications. Esophageal symptoms improved significantly and healing rates were higher in patients who commenced a structured lifestyle programme consisting of dietary intervention, weight loss and smoking cessation compared with patients who were treated with medication alone. These findings support the use of lifestyle modifications as a part of usual GERD management especially in groups with high risk factors such as diet and smoking.

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Authors contribution:

Data collection, manuscript preparation, and research design were aided by M.A., M.H.A., and M.A. Data analysis, interpretation, and a critical revision of the manuscript's intellectual content were completed by J.G., K.I., and L.T.

Data Availability:

The data supporting the findings of this study are available from the corresponding author upon reasonable request. All data have been anonymized to ensure participant confidentiality.

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