ORIGINAL RESEARCH

Auricular Point-Pressing With Bean Plus Esomeprazole Magnesium in Relieving Gastrointestinal Dysfunction

Jie Su, MS; Lu Chen, BS; Nian Song, BS; Xiaohong Li, BS; Juanjuan Huang, BS; Peibei Duan, MD

ABSTRACT

Context • The frequency of gastric-cancer (GC) diagnosis has been increasing in recent years and often has no obvious symptoms at an early stage. Upon clinical diagnosis of early GC (EGC), surgical treatment is generally recommended but as an invasive operation, surgical resection can't avoid postoperative gastrointestinal dysfunction (GID) and other problems.

Objective • The study intended to evaluate the clinical benefits for EGC patients of auricular point-pressing with beans, combined with esomeprazole magnesium (EM), for relieving gastrointestinal dysfunction (GID) after endoscopic submucosal dissection (ESD), aiming to provide accurate and effective reference opinions for future clinical treatment.

Design • The research team designed a retrospective analysis.

Setting • The study took place at the Jiangsu Province Hospital of Chinese Medicine in Nanjing, Jiangsu, China.

Participants • Participants were 78 EGC patients who underwent ESD at the hospital between January 2019 and January 2021 and who had developed postoperative GID.

Intervention • Thirty-seven patients chose to receive routine EM treatment, and they served as a control group. 41 patients chose to receive auricular point-pressing with bean plus EM intervention, and they served as a intervention group.

Outcome Measures • At baseline and postintervention, the research team measured the levels of serum motilin (MOT), substance P (SP), prealbumin (PAB), transferrin (TF), and albumin (ALB). They also recorded the time of intestinal peristalsis recovery, first exhaust, first defecation, normal food intake, and resolution of abdominal distension symptoms. Finally, they counted the incidence of adverse events during treatment.

Results • The levels of MOT, SP, PAB, TF, and ALB significantly changed between baseline and postintervention in both groups ($P < .05$). In the intervention group as compared to the control group postintervention, the decreases in the levels of MOT PAB, TF, and ALB and the increase in the SP level were significantly greater in the control group than those of the intervention group (all $P < .05$). In addition, the intervention group showed a shorter recovery time related to postoperative intestinal function and normal food intake and resolution of abdominal distension symptoms than did the control group (all $P < .05$), with a lower incidence of adverse events.

Conclusions • Auricular point-pressing with beans plus EM can effectively alleviate the GID of EGC patients after ESD and help them to maintain normal gastrointestinal function, and its use is worth popularizing in clinical settings. (*Altern Ther Health Med.* 2022;28(8):16-22).

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Gastric carcinoma (GC) ranks fifth worldwide for diagnosis frequency among cancers and third for cancer mortality.[1] Over one-million cases of GC are diagnosed every year in the world, and its malignant effects can cause a serious burden to families and society.[2]

Originating from gastric mucosal cells, GC often has no obvious symptoms at an early stage. As a result, most patients receive a diagnosis when the disease is already in the middle stage, leading to a bleak prognosis.[3] GC results from the combined action of multiple factors, among which the most common causes include Helicobacter pylori (Hp) infections, precancerous lesions, genetic factors, environment, and diet.[4]

Thanks to the rapid development of diagnosis using imaging and endoscopic technologies in recent years, the early diagnosis of GC (EGC) has gradually increased, which enables patients to find timely treatment.

Upon clinical diagnosis of EGC, surgical treatment is generally recommended.[5] Endoscopic submucosal dissection (ESD) is a standard minimally invasive treatment for precancerous lesions and early cancers of the digestive tract such as EGC and is the preferred surgical method for them, because it reduces the wound area as much as possible and lowers the incidence of complications as compared with traditional surgery.[6] ESD can reduce trauma, assure a relatively complete removal of pathological specimens by surgery, allow thorough treatment, and decrease the recurrence rate.[7]

As an invasive operation, surgical resection can't avoid adverse effects (AEs) that affect the patient's body. Because the operation aims to remove pathological tissue in the stomach, it can lead to postoperative gastrointestinal dysfunction (GID) and other problems.[8-10] Not only can it compromise the surgery's therapeutic effects but also can greatly reduce patients' quality of life.[8] Therefore, effective postoperative intervention is central to perioperative recovery of EGC patients and is still necessary to improve their postoperative prognoses.

Auricular Point-pressing With Beans

Auricular point-pressing with beans is a treatment in traditional Chinese medicine in which cowherb seeds are attached to important acupoints of the ears, after which massage stimulates the acupoints to achieve a therapeutic purpose.[11] The auricle is the visible part of the ear that is outside the head. In terms of treatment safety, traditional Chinese medicine treatment has absolute advantages.

Lu et al found that auricle acupoints can be closely linked to various organs of the body, including the stomach, spleen, and small and large intestines and can exert positive effects in adjusting the functions of the spleen, stomach, and intestinal tract.[12] In 2017, Li et al found that auricular point-pressing with beans significantly improved patients' gastrointestinal function after parathyroidectomy and autotransplantation.[13]

In recent years, nursing care using auricular point-pressing with beans has gradually increased for the rehabilitation of patients' body functions after various surgical operations. Wang et al found that stimulating acupoints with cowherb seeds can regulate the body's neuroendocrinal conduction function, stimulate the continuous contraction of visceral smooth muscles, and accelerate the activity of organs.[14]

In 2011, Li et al's study used pressure on participants' spleens, stomachs, large intestines, small intestines, and sympathetic points in conjunction with application of auricular point-pressing with beans and found that the treatments could inhibit the excitatory state of the cerebral cortex and had good postoperative sedative and tranquilizing effects for participants.[15]

Esomeprazole Magnesium

Esomeprazole magnesium (EM) is a commercially available drug commonly used to treat stomach diseases in clinics, and it's highly effective in reducing stomach inflammation, restoring gastrointestinal function, and eliminating Hp infections.[16,17] EM, an H+-K+-ATPase, inhibits adenosine triphosphate (ATP) with potent acid-suppressing effects, is a commonly used drug for treating gastritis in clinics, and has excellent effects on eliminating Hp infections.[18]

Some studies have found that EM can make Hp active by increasing the pH of gastric acid, so that antibiotics can easily remove the infection.[19] At the same time, EM can inhibit the urease that Hp requires to reduce Hp activity and prevent the secretion of gastric acid, and EM can be transformed into active ingredients in acidic gastric parietal cells, thus completing sterilization and improving gastrointestinal function.[20] However, EM, as a powerful gastric acid inhibitor, may destroy the stability of gastric function and cause gastric polyps or atrophic gastritis after long-term use.[21] For patients that have had partial gastric tissue removed by ESD, drug safety needs to receive more clinical attention.[22]

Current Study

The combination of auricular point-pressing with beans and EM may be able to effectively resolve postoperative GID in EGC patients after ESD. Relevant clinical reports on a combined intervention are lacking.

The current study intended to evaluate the clinical benefits for EGC patients of auricular point-pressing with beans combined with EM for relieving GID after ESD, aiming to provide accurate and effective reference opinions for future clinical treatment.

METHODS

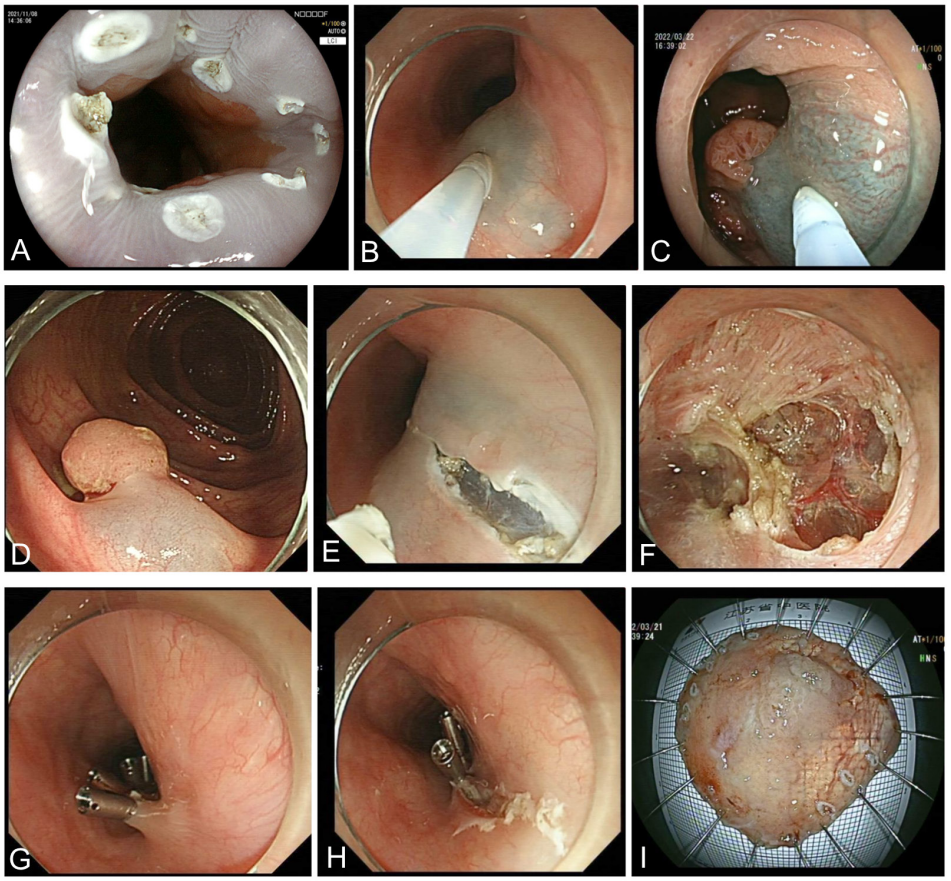
Participants

The research team designed a retrospective analysis The study took place at the Jiangsu Province Hospital of Chinese Medicine in Nanjing, Jiangsu, China. Participants were EGC patients who underwent ESD at the hospital between January 2019 and January 2021 and who had developed postoperative GID. We collected all medical records that met the research requirements from January 2019 to January 2021 as potential research subjects and determined the final research subjects after screening by inclusion and exclusion criteria. Moreover, we divided patients into groups according to their treatment methods, and then the research team compiled the survey results of the two groups for statistical analysis.

Potential participants were included in the study if they: (1) had been diagnosed with EGC for the first time at the hospital and underwent ESD there, (2) had normal cognitive and communication skills, (3) had complete clinical data, and (4) were willing to participate in the study.

Potential participants were excluded from the study if they: (1) had obvious distant metastasis or had cardiovascular or immune diseases, (2) had liver or kidney insufficiency,

Figure 1. Operational Flow of ESD. The surrounding lesions were marked (Figure 1A), submucosal injection (Figure 1B, C), the state of mucosal lifting (Figure 1D), incision of the mucosa (Figure 1E), stripping of the mucosa and muscularis propria (Figure 1F), and wound treatment (Figure 1G, H), Obtain tissue samples (Figure 1I).



Abbreviations: ESD, endoscopic submucosal dissection.

(3) patients not being treated as prescribed, (4) had drug allergies, or (5) were pregnant or lactating.

This study complies with the Declaration of Helsinki. The research team obtained approval of the study's protocols from the Ethics Committee of the Jiangsu Province Hospital of Chinese Medicine. All patients signed informed consent.

Procedures

Groups. Participants to an intervention or a control group, with the control group receiving routine EM treatment and intervention group receiving auricular point-pressing with beans plus the EM treatment. We collected all medical records that met the research requirements from January 2019 to January 2021 as potential research subjects and determined the final research subjects after screening by inclusion and exclusion criteria. Moreover, we divided patients into groups according to their treatment methods, and then the research team compiled the survey results of the two groups for statistical analysis.

ESD. After admission, all participants underwent ESD with the same surgical team at the hospital. Lesions were marked under an endoscope and lifted by an injection of a 10% glycerol-fructose mixture. Subsequently, the mucosa was incised circularly to completely separate it from the muscularis propria, so that the lesions could be completely resected at one time. After treatment of the wound surface, the surface and its edges were clamped and fixed with Hexie titanium clips (Zhimei Tiancheng 8MT Endoscope, Shenzhen, Guangdong, China), and the specimen was sent for the research team's inspection. Figure 1 shows the details of the surgical procedure.

Auricular point-pressing with beans. Completed by a Chinese physician in our hospital. The intervention group only received the procedure.

EM enteric-coated tablets. The research team purchased the tablets from AstraZeneca, (SFDA Approval No. H20046379, Wuxi, Jiangsu, China). Both groups received the tablets.

Outcome measures. The research team measured levels of serum motilin (MOT) and substance P (SP) at baseline and postintervention, with 5mL of fasting venous blood being sampled and left at room temperature for 30 min and then centrifuged for 10min at 4000 rpm/min.

The upper serum was obtained and examined using an enzyme linked immunosorbent assay (The kit was purchased from Quanshijin Biotechnology, Beijing, China). The research

team recorded and compared the intervention and control groups' times of postoperative intestinal peristalsis recovery, first exhaust, first defecation; the time of normal food intake; and the time of resolution of abdominal distension symptoms. At baseline and postintervention, the team also measured nutritional indices—serum prealbumin (PAB), transferrin (TF), albumin (ALB) content. The team also recorded adverse events (AEs) that occurred in the groups during treatment.

Intervention

Control group. The control group received 20mg EM tablets, administrated twice daily for 4 weeks.

Intervention group. The intervention group also received the same EM tablets on the schedule that the control group did. In addition, they received auricular point-pressing with bean therapy, using acupoints of the stomach, spleen, large intestine, endocrine, subcortex, and small intestine.

First, alcohol or normal saline was used for routine disinfection of both sides of the ears. Then the therapist placed cowherb seeds were placed in the middle of adhesive tape, which he or she then pressed tightly on the above-mentioned acupoints with one hand after fixing the auricle with the other hand. The therapist performed a manipulation from light to heavy until the acupoints appeared hot and became distended, and the participant experienced sensations of acidity and numbness.

The therapist conducted compression once every 6 hours and performed massage at the Zusanli, Hegu, and Shangjuxu acupoints once a day for 30 min before the participant went to bed.

In the process of postoperative treatment, nurses performed targeted nursing measures, including heath education, monitored participants' skin conditions, and psychological counseling.

Heath education. During treatment and nursing, the nurses provided health education to inform participants in the intervention group about the purpose and expected effects of auricular point-pressing with bean therapy, so that patients could improve their understanding of the treatments, thus improving their compliance and cooperation and achieving better results.

Skin condition. The nurses paid attention as to whether participants' local skin appeared abnormal during the auricular point-pressing with beans, explained to them how to keep the auricle dry and clean and helped them to do so, supplemented the beans if any fell off, and intervened in a timely manner when a participant suffered an AE.

Psychological counseling. The nurses gave psychological counseling to guide patients to express their inner needs and met reasonable requests as far as possible. In addition, they strengthened communications with participants (actively chatting with patients, asking patients about their treatment feelings, educating disease-related knowledge, etc.) and gave them encouragement and consolation to comfort them so as to decrease any negative psychological emotions and improve their degree of cooperation.

Outcome Measures

MOT. MOT stimulates gastric and small-intestine motility, causing undigested food to move into the large intestine MOT is one of the digestive tract hormones, and its role is to promote and affect gastrointestinal motility and the transportation of water and electrolytes in the gastrointestinal tract. The level of MOT directly reflects the gastrointestinal motility of the human body. The higher the MOT, the better the gastrointestinal motility.

SP. SP is a neurotransmitter and modulator of pain perception that alters cellular signaling pathways. At the same time, SP is also a gastrointestinal hormone that plays an anti-inflammatory role in the gut. Increased SP indicates that the gut is more resistant to inflammatory responses.

Times of postoperative intestinal peristalsis recovery, first exhaust, and first defecation and times of normal food intake and resolution of abdominal distension symptoms. The research team evaluated recovery of gastrointestinal function in both two groups. These indicators are the most intuitive manifestations of gastrointestinal motility.

PAB, TF, and ALB. These measurements are nutritional indices. PAB, TF, and ALB are currently routine items of clinical nutrition examination. The higher the test result, the better the nutritional status of the human body.

AEs. The total incidence of AEs—dizziness, headache, digestive-tract symptoms, gastric fatigue, malnutrition, and arrhythmia—were counted.

Statistical Analysis

SPSS23.0 (IBM, Armonk City, New York, USA) was used to process the data. Categorical data were expressed by numbers and percentages and compared between the groups using the Chi-square test. Measurement data was given as means ± standard deviations (SDs), and the t test was applied to those in normal distribution. $P < .05$ was the threshold for statistical significance.

RESULTS

Clinical Data

The study included and analyzed the data of 78 participants, with 37 participants in the control group and 41 participants in the intervention group. The intergroup comparison in terms of age, body mass index (BMI), gender, living environment, and ethnicity (Table 1) found no statistically significant differences ($P > .05$), indicating the experimental comparability between the two groups and supporting the reliability of the results.

Serum MOT and SP Levels

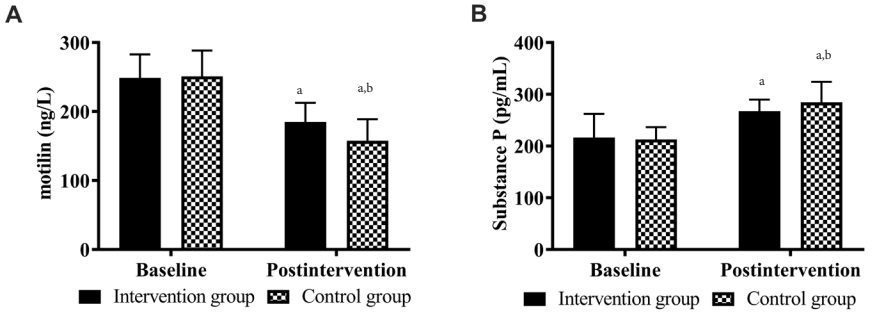
No significant differences existed between the intervention and control groups in the levels of the serum MOT at baseline ($P > .05$). Figure 2A shows that the MOT had significantly decreased in both groups postintervention ($P < .05$), but the decrease in the control group was significantly greater than that in the intervention group ($P < .05$)

Table 1. Clinical Baseline Data (N = 78)

		BMI	Gender		Living Environment		Nationality	
Group	Age Mean ± SD	kg/cm² Mean ± SD	Male n (%)	Female n (%)	Urban n (%)	Rural n (%)	Han n (%)	Minority n (%)
Intervention group, n = 41	57.2 ± 3.5	25.8 ± 2.1	18 (43.90)	23 (56.10)	21 (51.22)	20 (48.78)	38 (92.68)	3(7.32)
Control group, n=37	57.6 ± 3.6	25.5 ± 3.2	15 (40.54)	22 (59.46)	17 (45.95)	20 (54.05)	35 (94.59)	2(5.41)
t or χ^2	0.497	0.494	0.090		0.217		0.119	
P value	.621	.623	.764		.642		.731	

Abbreviations: BMI, body mass index.

Figure 2. Levels of Serum Motilin and Substance P of the Intervention and Control Groups at Baseline and Postintervention. Figure 2A shows the serum motilin levels, and Figure 2B shows the substance P levels.



[a]*P* < .05, indicating that the serum motilin had significantly decreased and substance P had significantly increased between baseline and postintervention for both groups

[b]*P* < .05 indicating that the decrease in serum motilin and increase in substance P postintervention were significantly greater for the control group than for the intervention group

Abbreviations: CON group, control group; RES group, intervention group.

No significant differences existed in the SP levels of the groups at baseline (*P* > .05). Figure 2B shows that the levels in both groups had significantly increased postintervention (*P* < .05), but the increase for the control group was significantly greater than that in the intervention group (*P* < .05). Both groups of patients had different degrees of postoperative injury to gastrointestinal function, but the damage was milder in intervention group compared with control group.

Recovery of Gastrointestinal Function

Recovery of postoperative intestinal function was significantly faster (*P* < .05) in the intervention group than the control group (Figure 3A). Similarly, the first exhaust time and first bowel movement also occurred significantly more quickly postintervention (*P* < .05) in the intervention group than in the control group (Figures 3B and 3C).

Postoperative Eating Status

The time of normal food intake and resolution of abdominal distension symptoms occurred significantly faster (*P* < .05) in the intervention group than in the control group (Figures 4A and 4B).

Nutritional Indices

Figures 5A, 5B, and 5C show that no significant differences were observed in the PAB, TC, and ALB levels, respectively, between the intervention and control groups at baseline (*P* > .05). All three levels decreased significantly for both groups between baseline and postintervention (*P* < .05).

Postintervention, the decreases in the PAB, TC, and ALB levels (*P* < .05) were found to be significantly greater for the control group than those for the intervention group.

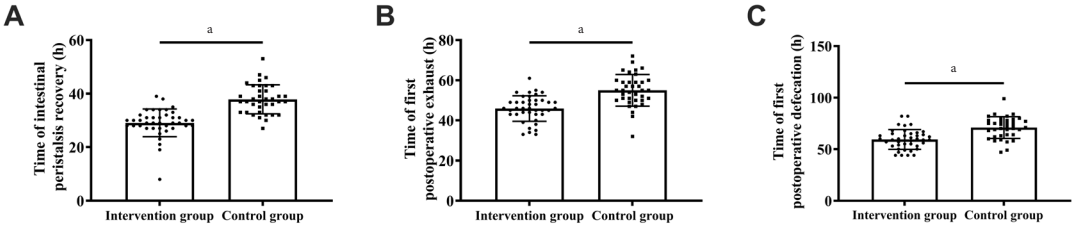
Table 2. Incidence of Adverse Events (AEs) for Participants

Adverse Event	Intervention Group n = 41 n (%)	Control Group n = 37 n (%)	χ^2	*P* value
Dizziness and headache	1 (2.44)	2 (5.41)		
Digestive-tract symptoms	1 (2.44)	1 (2.70)		
Gastric fatigue	1 (2.44)	1 (2.70)		
Malnutrition	0 (0.00)	1 (2.70)		
Arrhythmia	0 (0.00)	0 (0.00)		
Total incidence of AEs	3 (7.32)	5 (13.51)	0.811	.368

Incidence of AEs

Regarding the overall incidence of AEs, three participants in the intervention group experienced an AE (7.32%), with one participant experiencing dizziness and headache, one digestive-tract symptoms, and one gastric fatigue (Table 2). In the control group, five participants experienced an AE (13.51%), with two participants experiencing dizziness and

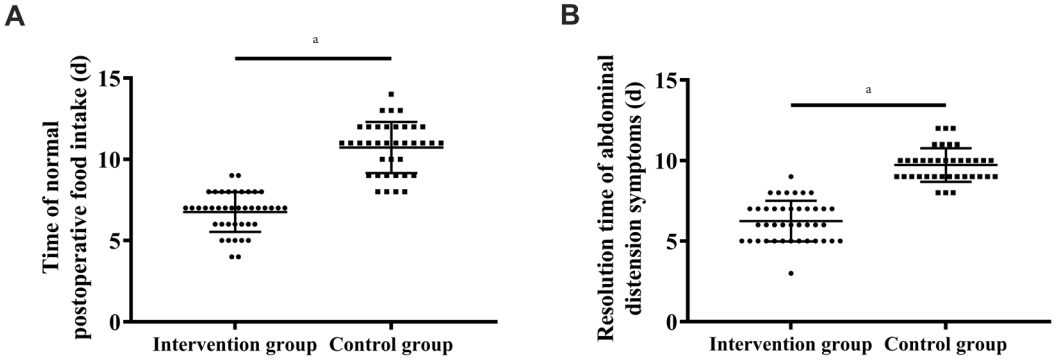
Figure 3. Recovery of Gastrointestinal Function in the Intervention and Control Groups. Figure 3A shows the time of intestinal peristalsis recovery; Figure 3B shows the time of first postoperative exhaust; and Figure 3C shows the time of first postoperative defecation.



[a]$P < .05$, indicating that the times of intestinal peristalsis recovery, first postoperative exhaust, and first postoperative defecation occurred significantly faster for the intervention group than for the control group

Abbreviations: CON group, control group; RES group, intervention group.

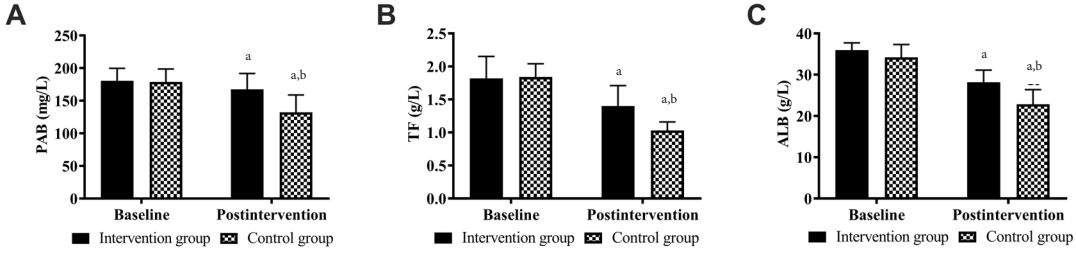
Figure 4. Postoperative Eating Status of Patients in the Intervention and Control groups. Figure 4A shows the time of normal postoperative food intake, and Figure 4B shows the resolution time of abdominal distension symptoms.



[a]$P < .05$, indicating that the times of normal postoperative food intake and resolution time of abdominal distension symptoms occurred significantly faster for the intervention group than for the control group

Abbreviations: CON group, control group; RES group, intervention group.

Figure 5. Comparison of Nutritional Indices Between the Intervention and Control Groups at Baseline and Postintervention. Figure 5A shows the PAB levels; Figure 5B shows the TF levels; and Figure 5C shows the ALB levels.



[a]$P < .05$, indicating that the PAB, TF, and ALB had all significantly decreased between baseline and postintervention for both groups
[b]$P < .05$, indicating that the decreases in PAB, TF, and ALB were significantly greater postintervention for the control group than for the intervention group

Abbreviations: ALB, albumin; CON group, control group; PAB, prealbumin; RES group, intervention group; TF, transferrin.

headache, one digestive-tract symptoms, one gastric fatigue, and one malnutrition.

No significant difference existed between the two groups ($P > .05$). The combination of auricular point-pressing with beans and EM showed a high level safety for GID after ESD.

DISCUSSION

Nationwide screening programs and the progress of endoscopic knowledge and technology have enabled an increase in EGC.

The current study found that MOT decreased and SP increased in both group postintervention, with a significantly higher MOT and lower SP in intervention group compared with control group. In addition, as did previous studies,[10,13] the intervention group had a significantly shorter time of postoperative intestinal peristalsis recovery, first exhaust, first defecation, normal food intake and abdominal distension resolution, which suggests a better rehabilitation of postoperative gastrointestinal function in the intervention group compared to that of the control group. The results of the current study are basically consistent with the previous research on auricular point-pressing with beans,[14,15,23,24] which can also confirm the excellent benefits for the treatment in ESD in the future.

Also, in the investigation of the nutritional status of the two groups and the adverse reactions during treatment, the current study found better results for the intervention group, which also verifies the research team's viewpoint that the use of auricular point-pressing with beans plus EM can not only further improve the gastrointestinal nutritional status of patients and promote the rehabilitation of GID but also can ensure the medication safety of patients, showing a high potential for clinical application in the future.

However, the current study had many limitations. For example, the benefits of auricular point-pressing with beans plus EM on other types of GID rather than that just ESD need further exploration. In addition, due to the short intervention period, the current research team hasn't been able to assess the long-term prognosis of patients, which warrants a longer-term investigation. Finally, the research team needs to expand the study's sample size to obtain more representative results for clinical reference.

CONCLUSIONS

Auricular point-pressing with beans plus EM can effectively improve the GID of EGC patients after ESD and help them to maintain normal gastrointestinal function, and its use is worth popularizing in clinical settings.

AUTHOR CONTRIBUTIONS

Jie Su and Lu Chen contributed equally to this work.

AUTHORS' DISCLOSURE STATEMENT

All authors declared there is no any conflict.

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