

Original Article

Effects of early oral feeding on relapse and symptoms of upper gastrointestinal bleeding in peptic ulcer disease

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Background: Peptic ulcer is the most common cause of upper gastrointestinal bleeding (GIB) and nutritional support is a helpful strategy in malnutrition prevention during treatment. As early oral feeding in patients with GIB may shorten hospital stay and decrease costs and risk of infection, the present study was carried out to investigate the effects of early oral feeding on relapse and symptoms of upper GIB.

Methods: The present clinical trial was conducted with the participation of 100 patients with upper GIB due to gastric or duodenum ulcer at Emam Reza University Hospital in Tabriz. Subjects were randomly allocated to two groups ($n = 50$). In one group, patients received oral diet from day 1 and in other group patients were nil by mouth until day 3 and then received oral diet. Endoscopic and clinical findings of patients were recorded from day 1 to 3.

Results: The mean age of subjects was 57.6 ± 1.7 and 63% were male. Sclerotherapy was used in most cases as a

hemostasis treatment. There was no significant difference in laboratory findings and rebleeding between the two groups. In the group with early oral feeding, the time of hospital stay was significantly shorter than in the control group ($P < 0.001$).

Conclusion: Although early oral feeding had no significant effects on electrolyte balance and treatment outcomes in patients with upper GIB who were treated with endoscopic hemostasis, it could effectively shorten the hospital stay. Consequently, early oral feeding in these patients enables early discharge and reduces the costs of treatment.

Key words: early feeding, endoscopy, gastrointestinal bleeding, peptic ulcer

INTRODUCTION

PEPTIC ULCER IS the most common cause of upper gastrointestinal bleeding (GIB) and is responsible for 50 percent of cases.^{1,2} It has been shown that endoscopic hemostasis improves outcomes in patients with bleeding ulcers and also has a better impact on rebleeding, necessity for surgery, and survival.^{3–5} Other treatments for peptic ulcers are antagonist H2 receptor (histamine receptors) and proton pump inhibitors.^{6–10}

Nutritional support is a helpful strategy in malnutrition prevention during peptic ulcer treatment.¹¹ Lack of oral feeding for patients in hospital wards causes prolongation of hospital stay¹² and increases the risk of nosocomial infec-

tions.^{13,14} It is observed that early feeding does not increase complications in patients after endoscopy and may also shorten length of hospital stay.¹⁵ In patients fed through a catheter (total parenteral nutrition or TNP), there is the possibility of vascular catheter-site infection which causes septicemia and thrombophlebitis. Lack of oral feeding decreases intestinal mucosa and causes atrophy of the intestinal wall, which can develop into gastrointestinal septicemia due to entrance of intestinal bacteria through the atrophic intestinal wall.^{16–19}

Early feeding is therefore not started because of the possibility of rebleeding from gastric inflammation. These patients also face water and electrolyte imbalances due to lack of oral feeding, which can be aggravated by renal failure.¹⁹ The role of eating in rebleeding is still unknown. Moreover, all patients with gastric ulcer bleeding are prohibited from eating for 48 to 72 hours. Although nutritional support in patients who are in a critical condition may lead to decreased mortality, keeping the stomach empty is an accepted principle. Therefore, lack of feeding in patients in

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critical condition (who are mostly elderly adults) can cause poor health results. Besides, no correlation between rebleeding and oral feeding in patients who have peptic ulcers has been determined.

As early oral feeding in patients with GIB may shorten hospital stay and decrease costs and risk of infection, the present study was carried out to investigate the effects of early oral feeding on relapse and symptoms of upper GIB.

METHODS

IN THE PRESENT clinical trial, 100 patients with upper GIB due to gastric or duodenal ulcer who were admitted to Emam Reza University Hospital in Tabriz were entered into the study. Peptic or duodenal ulcer was confirmed by endoscopy and inclusion criteria were age between 20 and 80 years, absence of other GI diseases, no history of malignancy or GI surgery, and absence of kidney disease and blood clotting disorders.

Before the start of the study, the research purpose was explained to the patients. Participation in the study was completely voluntary and all persons who participated in the study signed a consent form. Subjects were randomly allocated into two groups ($n = 50$). These two groups were matched according to absence of diseases which may confound the results. In one group, patients received oral diet from day 1 and in the other group patients were nil by mouth until day 3 and then received oral diet. Demographic information for each patient was extracted by the ward nurse and endoscopic findings were recorded by the physician in charge of endoscopy patients.

In group A (control group) patients were prevented from oral feeding for 3 days after endoscopy and had dextrose saline intravenous fluids. On the third day, endoscopy was done again and the existence of new wounds and new pathological findings were recorded on the checklist. If patients had any signs of bleeding, they remained at nil per os (NPO). In group B (intervention group), patients were removed from NPO between 6 and 12 h after endoscopic treatment and feeding by liquid diet consisted of soup (the food available at the hospital).

Endoscopic and clinical findings in patients were recorded on the first and third days. Laboratory variables were assessed on the first day and again on the third day, which included hemoglobin, hematocrit, sodium, potassium, blood urea and serum creatinine. All 100 patients had endoscopy twice, at the beginning and after 48 h. Then, patients who had a clean-based ulcer were discharged and those who still had stigmata of recent bleeding were kept in hospital for further endoscopy (for the third time as a control endoscopy) 48 h later.

All patients in group A were kept at NPO until we were sure that their ulcer was clean-based. The patients in group B were continually fed a filtered liquid diet until their ulcer became clean-based. The patients in both groups who had a clean-based peptic ulcer with the following four criteria were discharged: (i) stable and normal vital signs; (ii) hemoglobin >10 ; (iii) no electrolyte imbalance; and (iv) no recent rise in creatinine. Patients not meeting these four criteria were started on a regular oral diet while remaining in hospital.

All statistical analyses were carried out using SPSS. Student's *t*-test (or Mann–Whitney *U*-test if the variable was not normal) was used to compare means of continuous variables. Pearson's chi-squared and contingency tables were carried out to test for independence between discrete classifications variables. Continuous variables are presented as mean $\pm$ standard deviation and other parameters as frequency and percentage. A *P*-value of 0.05 or less was considered statistically significant and all reported *P* values were two-sided.

RESULTS

ONE HUNDRED PATIENTS entered this study. The mean age of subjects was 57.6 ± 17.0 years (the median was 60 years) and 63% of patients were male. The mean age of subjects in group A was 58.7 ± 18.1 years and in group B it was 56.6 ± 17.8 years. There was no statistical difference between the age groups. Also, 64% of patients in group A and 62% of patients in group B were male (no statistical deference was assessed).

Overt bleeding was observed in 4% (group A) and 6% (group B) of patients, respectively (no significant difference). In addition, oozing and coffee grounds were found in 11 and 14 cases (in group A) and in six and 13 cases (in group B) respectively. There was no significant difference between the two groups according to type of bleeding.

Sclerotherapy was used in most cases as a hemostasis treatment for hemorrhagic ulcers (62% in group A and 82% in group B). Another treatment used was argon plasma coagulation (APC) (22% in group A and 10% in group B) and, in the remaining cases, both treatments were used. There was no statistical difference between the two groups according to treatment type (*P*-value = 0.08).

Types of lesion at initial endoscopy prior to baseline in both groups were as follows: 46 cases (92%) with visible vessel type and four cases (8%) with adhesion clot (in group A), 43 cases (86%) with visible vessel type and seven cases (14%) with adhesion clot (in group B). No statistical difference was observed using chi-squared test

Table 1 Laboratory findings before intervention

Laboratory variable	Group A (mean $\pm$ SD)	Group B (mean $\pm$ SD)	P-value
Sodium	141.36 $\pm$ 3.24	141.68 $\pm$ 2.35	0.57
Potassium	5.41 $\pm$ 0.87	4.52 $\pm$ 0.09	0.31
Serum creatinine	1.16 $\pm$ 0.60	1.11 $\pm$ 0.60	0.69
Urea	75.78 $\pm$ 47.01	71.20 $\pm$ 46.08	0.62
Hemoglobin	12.84 $\pm$ 2.06	10.69 $\pm$ 0.39	0.30
Hematocrit	33.31 $\pm$ 10.34	32.57 $\pm$ 9.40	0.71
Platelets	237.82 $\pm$ 123.02	248.32 $\pm$ 138.73	0.69
PT	13.69 $\pm$ 2.72	14.15 $\pm$ 4.39	0.50
PTT	31.38 $\pm$ 5.96	32.72 $\pm$ 7.34	0.31
Blood transfusion	0.14 $\pm$ 0.07	0.08 $\pm$ 0.05	0.50

PT, prothrombin time; PTT, partial thromboplastin time.

Table 2 Laboratory findings on the third day after intervention

Laboratory variable	Group A (mean $\pm$ SD)	Group B (mean $\pm$ SD)	P-value
Sodium	140.48 $\pm$ 3.52	140.73 $\pm$ 3.65	0.73
Potassium	4.11 $\pm$ 0.27	4.15 $\pm$ 0.27	0.51
Serum creatinine	1.16 $\pm$ 0.63	1.20 $\pm$ 0.67	0.95
Urea	35.98 $\pm$ 24.01	33.04 $\pm$ 20.46	0.51
Hemoglobin	11.51 $\pm$ 3.16	11.19 $\pm$ 1.93	0.55
Hematocrit	33.41 $\pm$ 7.75	33.88 $\pm$ 6.75	0.75
Platelet	173.14 $\pm$ 84.68	171.34 $\pm$ 69.62	0.91
PT	16.71 $\pm$ 3.43	13.11 $\pm$ 0.12	0.31
PTT	30.09 $\pm$ 5.36	30.06 $\pm$ 4.90	0.98
Blood transfusion	0.16 $\pm$ 0.07	0.12 $\pm$ 0.06	0.70

PT, prothrombin time; PTT, partial thromboplastin time.

($P=0.8$). Rebleeding occurred in patients in group A in five cases (10%) and in group B in four cases (8%).

Before the end of 48 h, endoscopy was carried out again in those who were rebleeding. The results of endoscopy indicated that in group A, two cases were overt type and three cases were coffee ground type. In contrast, in group B, one case was oozing type, one case was coffee ground type and two cases were overt.

Endoscopic hemostasis was carried out in group A as follows: sclerotherapy in one case (1 out of 5), APC in two cases (2 out of 5) and, in two cases (2 out of 5) the two methods were carried out. In group B, sclerotherapy was carried out in two cases (2 out of 4), APC in one case (1 out of 4) and both methods in one case (1 out of 4). No statistical difference was observed (P -value = 0.63).

In the group with early oral feeding, the time of hospital stay was significantly shorter than in the control group ($P<0.001$); the mean of hospital stay for group A was 5.9 ± 1.4 days versus 4.2 ± 1.2 days for group B.

No mortality occurred in either group and one patient from each group required surgery and was transferred to the surgical ward.

Laboratory findings before and after feeding are shown in Tables 1 and 2, respectively. As can be seen, there was no significant difference between the groups regarding laboratory findings. Laboratory findings in both groups before and after the intervention were also compared (Tables 3,4). In both groups, it can be seen that platelet and urea levels after the study were significantly lower than before the study.

DISCUSSION

IN THE PRESENT study, endoscopic hemostasis was successfully used for all patients to control bleeding. Nutritional support is one of the helpful strategies in malnutrition prevention during treatment¹¹ and lack of oral feeding causes

Table 3 Comparison of laboratory findings before and after intervention in group A

Laboratory variable	Before intervention (mean $\pm$ SD)	After intervention (mean $\pm$ SD)	P-value
Sodium	141.36 $\pm$ 3.24	140.48 $\pm$ 3.52	0.15
Potassium	5.41 $\pm$ 0.87	4.19 $\pm$ 0.03	0.17
Serum creatinine	1.16 $\pm$ 0.60	1.19 $\pm$ 0.63	0.50
Urea	75.78 $\pm$ 6.64	35.98 $\pm$ 3.39	<0.001
Hemoglobin	12.84 $\pm$ 2.06	11.51 $\pm$ 0.44	0.5
Hematocrit	33.31 $\pm$ 10.34	33.41 $\pm$ 7.75	0.9
Platelet	237.82 $\pm$ 17.39	173.14 $\pm$ 11.97	<0.001
PT	13.69 $\pm$ 0.38	16.71 $\pm$ 3.43	0.37
PTT	31.38 $\pm$ 5.96	30.09 $\pm$ 5.36	0.08
Blood transfusion	0.14 $\pm$ 0.07	0.16 $\pm$ 0.07	0.82

PT, prothrombin time; PTT, partial thromboplastin time.

Table 4 Comparison of laboratory findings before and after intervention in group B

Laboratory variable	Before intervention (mean $\pm$ SD)	After intervention (mean $\pm$ SD)	P-value
Sodium	141.67 $\pm$ 2.37	140.73 $\pm$ 3.65	0.07
Potassium	4.51 $\pm$ 0.69	4.15 $\pm$ 0.27	0.004
Serum creatinine	1.12 $\pm$ 0.63	1.20 $\pm$ 0.67	0.22
Urea	70.97 $\pm$ 46.99	33.04 $\pm$ 20.46	<0.001
Hemoglobin	10.73 $\pm$ 2.94	11.19 $\pm$ 1.93	0.28
Hematocrit	32.74 $\pm$ 9.79	33.88 $\pm$ 6.75	0.34
Platelet	224.26 $\pm$ 106.82	171.34 $\pm$ 69.62	0.04
PT	14.19 $\pm$ 4.58	13.11 $\pm$ 0.81	0.09
PTT	32.56 $\pm$ 7.42	30.06 $\pm$ 4.90	0.013
Blood transfusion	0.08 $\pm$ 0.05	0.12 $\pm$ 0.06	0.65

PT, prothrombin time; PTT, partial thromboplastin time.

prolongation of hospital stay¹² and increases the risk of nosocomial infection.^{13,14}

Lally *et al.* indicated that any intestinal feeding that supplies glucose calories provides protection against gastric ulcer and is more effective than antacids.²⁰ McClave and Chang could not prove a relationship between feeding and rebleeding because they investigated oral feeding by a special diet in all patients with upper gastrointestinal bleeding, regardless of the etiology of their bleeding. They observed increased and decreased risk of bleeding in some groups.²¹

In our study, there was no difference between the two groups according to the rate of rebleeding or necessity for

blood transfusion. In two studies conducted by de Ledingham *et al.*, no significant association was observed between rebleeding and early oral feeding.^{15,22} Ashby *et al.* studied early feeding with drops of milk into the stomach of 425 patients hospitalized due to peptic ulcer. The rate of mortality among these patients was 4.9%.²³

Early feeding is widely investigated in other fields of medicine in order to control disease. Several studies have shown that early feeding after elective colectomy or colonic anastomosis is effective and the majority of patients can tolerate it.^{24,25}

Failure to progress to oral feeding in internal medicine wards is associated with prolonged hospitalization and can increase the risk of nosocomial infection. Deane *et al.* reviewed the nutritional status of critical condition inpatients, hospitalized in internal medicine wards, and emphasized that oral feeding improves patients' condition faster, decreases recovery time and reduces hospital mortality rates.²⁶

A study by de Ledingham *et al.* aimed to clarify an appropriate time to begin oral feeding in patients with gastrointestinal bleeding due to peptic ulcer and observed that hospitalization time was significantly lower in the group receiving oral feeding. Their study concluded that early feeding in these patients did not worsen the results of disease and reduced length of hospital stay.¹⁵ In contrast, a study by de Ledingham *et al.* that investigated the role of early feeding in cirrhotic patients with gastrointestinal bleeding indicated no statistical association between oral feeding and hospital stay.²² Moreover, in the present study, duration of hospitalization in the group that underwent early oral feeding was significantly shorter, which indicates that early feeding not only does not increase the side-effects, but also reduces the duration of hospitalization. Besides, no deaths occurred and no patients required surgery in both groups.

Early feeding is not started because of the possibility of rebleeding from gastric inflammation. These patients are also faced with the interactions of water and electrolytes due to lack of oral feeding which can be aggravated by renal failure.²⁶ In the present study, platelet levels and levels of urea had significantly reduced in both groups. Urea levels can be reduced due to a decrease in bleeding and the production of urea. The reduction of platelets can also be due to receiving packed cells. In group B, there was a significant difference in prothrombin time (PTT) and potassium level. No difference was observed for other laboratory findings.

It is observed that early feeding has no negative impact on the status of electrical equilibrium. The study by de Ledingham *et al.* also reported no significant difference between groups in levels of hemoglobin and creatinine.²²

The present study is the first investigation on the role of early feeding on recurrence and complications of

gastrointestinal bleeding due to peptic ulcer. One of the limitations of this study was the small sample size. Another limitation was the inability to reconcile all patients with the inclusion criteria because it was necessary to obtain informed consent from all of them. Considering that in other studies, patients were early feeding by a nasogastric tube (NG) and internal methods, a study to evaluate the effects of early feeding in patients with gastrointestinal bleeding using a NG tube should be designed.

CONCLUSION

ALTHOUGH EARLY ORAL feeding in patients with upper GIB who were treated with endoscopic hemostasis did not have any significant effects on electrolyte balance and treatment outcomes, it could effectively shorten hospital stay. Consequently, early oral feeding in these patients can enable early discharge and reduce the costs of treatment.

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