Preoperative upper endoscopy and bariatric surgeries

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(*Submitted: 04 July 2017 – Revised version received: 12 August 2017 – Accepted: 02 October 2017 – Published online: 26 June 2018*)

Objectives In this study, the frequency rate of incidental findings in esophageal and gastric endoscopy of morbid obese subjects' candidate for bariatric surgery was determined.
Methods and Materials In this observational study, 1663 consecutive patients candidate for bariatric obesity in Rasool-Akram Hospital were enrolled and the upper endoscopy was done and the frequency rate of incidental findings was determined.
Results In this study, 41, 31, 27.3, 6, 0.8, 0.8% respectively had Helicobacter pylori infection, hiatal hernia, esophagitis, esophageal ulcer, gastric ulcer and polyp. Esophagitis and esophageal ulcer were significantly more common among male subjects (9% males, 5% females and 33% males, 25% females) and the mean age was higher among those with esophageal ulcer and H. pylori infection ($P = 0.01$ and 0.007 respectively). In general it can be concluded that about 1/3 of patients (35%) with morbid obesity have incidental findings on endoscopy.
Conclusion Totally, according to the obtained results, it may be concluded that nearly 1/3 of morbid obese subjects candidate for bariatric surgery have incidental findings in preoperative upper endoscopy.
Keywords bariatric surgeries, esophagogastroduodenoscopy, incidental findings

Introduction

Obesity and overweight is correlated with some chronic diseases such as coronary artery, diabetes mellitus, most of cancers and musculoskeletal problems.[1] The fat stored in a body acts as an energy source. When the body intake a lot of energy, additional energy accumulates in fats and contribute with weight gain. Obesity is as the result of sedentary life and intake of a lot of energy. The obesity -associated diseases include type II mellitus diabetes, dyslipidemia, obstructive sleep apnea and the increased risk of coronary artery diseases.[2] The obesity could lead to increasing pressure on the spine and also the thermo-regulation disorder in warm weather condition. The treatment of obesity depends upon the alternation of life style and mostly emphasis on diet and exercise. Obese people (BMI = 35–45) with associated disease are those that just changing the life style is not effective, thus FDA recommended to administrate drugs or do operation for these kinds of patients.[3] The annual cost of weight loss is estimated to be more than 117 billion dollars each year. Weight loss was a major goal of the world in 2010 to promote the quality of people's health.[4] The medicine and sport collage of USA had proposed various methods such as diet, exercise, administration of different drugs and behavioral strategies, to lose weight. Weight loss leads to reduction of LDL, TG and increase of HDL, improvement of glucose tolerance, decrease of insulin resistance and reduce fast glucose rates and inflammatory markers like CRP that is correlated with coronary artery diseases. Heart, Lung and Blood Institute Guideline recommended at least 10% of weight loss in reducing the risk of VCD.[5]

Bariatric surgery is one of the most effective procedure for immediate weight loss in patients and mostly this surgery is performed in stomach and esophagus, so the endoscopic evaluation of these organs become impossible.[3] For example, hiatal hernia can be diagnosed through endoscopy and in-patients with this problem, gastric banding is contraindicated. Gastric Ulcers in remnant stomach would be ignored otherwise the effect of obesity on incidence of different gastro-esophageal disorders is not clearly understood. It is important to treat most of these disorders before the bariatric surgery.[3] So the aim of this study was to find the prevalence of gastro-esophageal disorders in morbid obese patients.

The bariatric surgery is the most effective and long lasting remedy for obese patients which depends on sequential exercise after surgery.[2] However, research demonstrate that about 80% of patients undergoing surgery do not take the recommendation of doctors to do an exercise for more than 150 minutes in a week.[1]

Because in bariatric surgeries, large part of stomach is involved these parts always become inaccessible to endoscopy. So the possible finding from endoscopy of upper GI tracts before surgery could be helpful to make the right decision for patients.[2,3] For instance, the gastric band surgery is a contraindicated in the presence of Hiatus hernia that could be easily diagnosed by endoscopy before the surgery. Also ulcers will be inaccessible in endoscopy after gastric bypass, that they should be diagnosed and treated before the surgery. Thus given the importance of this issue, this study evaluated the frequency of accidental findings of esophagi and gastric endoscopy before the bariatric surgery.

Material and Methods

In this cross-sectional study, all 1663 patients with obesity (defined as BMI ≥ 40 or BMI ≥ 35 along with underlying risk factors like diabetes) that referred to Obesity Clinic of Rasool-Akram Hospital, a referral who were candidate for bariatric surgery during 2012–2013 were enrolled in this study. People asked to fill the consent form before upper GI endoscopy and the frequency of accidental findings in esophagus and stomach were determined. All data were registered in Iran National Obesity Surgery Database (www.obesitysurgery.ir).

After collection of information, data were analyzed with SPSS version 13 Software. The frequency for qualitative variables

and means and standard deviations were calculated for quantitative variables. Chi-square and Fisher's exact test and independent *T*-test were used for interpretation of results and the *P*-value less than 0.05 consider significant.

Results

Of 1663 patients, 82.7% were females and 17.3% were males. The mean age of people were 40.8 + 10.5 years. The average of BMI was 45.7% + 5.33 kg/m^2.

Among patients who underwent the preoperative upper endoscopy, 41.2% had *Helicobacter pylori* infection, 31% hiatal hernia, 27.3% esophagitis, 6% esophageal ulcer, 0.8% peptic ulcer, and 0.8% polyp (Figure 1). There was statistically relation with mean age of patients with esophageal ulcer ($P = 0.002$) and *H. pylori* infection ($P = 0.001$), also the frequency of esophageal ulcer was higher in female than male (9.1% vs 5.3%) and this difference was statistically relevant ($P = 0.014$). On the other hand, the frequency of hiatus hernia, peptic ulcer, and BMI had not any statistical relation with mean age of patients. Also the rest esophagogastroduodenoscopy findings had not any statistical correlation with sex, too ($P = 0.007$). Peptic ulcer, polyp and *H. pylori* infection had no correlation with BMI of patients.

Discussion

Unfortunately routine endoscopy examination of upper GI tract before bariatric surgery in asymptomatic patients is not recommended in reference books but type of bariatric surgery and treatment of patients can be influenced by most of the endoscopy findings such as peptic ulcers, hiatal hernia, esophagitis and reflux. Thus, in current study we aimed to evaluate prebariatric surgery endoscopy incidental findings and its effects on choosing appropriate type of bariatric surgery for the patients. Also treatment of some gastric disorders that accidentally diagnosed may have a great impact on outcomes of operation.

For example, in-patients with hiatal hernia, gastric banding is not recommended. In gastric bypass surgery, a part of the stomach is permanently unavailable from endoscopic evaluations and this is important to have preoperative screening endoscopy, especially in patients with a family history of stomach cancer or esophageal metaplasia.[3]

In this study 41.2% of patients had been infected with *H. pylori*, 31% of people hiatal, 27.3% had esophagitis hernia, 6% esophagitis ulcer, 0.8% peptic ulcer, and 0.8% had polyp. The incidence of esophagitis and ulcers of esophagus among men was significantly higher and also the mean age of patients was significantly higher in patients with esophagitis, ulcer of esophagus and infection of *H. pylori*.

One study conducted in Spain showed that 48.7% of people from 194 candidate for bariatric surgery treatment, had a gastric disorders in upper GI tract. Three patients (1.5%) had a peptic ulcer and 69.3% had *H. pylori* infection.[4] However, the frequency of positive results of endoscopy and existence of *H. pylori* in our study was less than current study; the frequency of ulcer was somewhat similar. Because of the importance of gastric ulcers endoscopy appears to be reasonable.

In one study in Brazil, 57.9% of 126 candidate for bariatric surgery had a one positive finding in endoscopy. In overall 3.2% of patients had an ulcer and 53.2% were positive for *H. pylori* infection.[5] In our study the frequency of positive cases was similar, however, the overall frequency of endoscopic findings and positive *H. pylori* infection was less than this study. In our study frequency of gastric ulcers was twice and this can show the importance of endoscopy.

Table 1. **Percentage of endoscopic finding in relation with sex***

Gender	Disease											
	Hiatal hernia		Esophagitis		Esophageal ulcer		Peptic ulcer		*H. pylori*		Polyp	
	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
Male	32.80	67.20	33.80	66.20	9.10	90.90	1.70	98.30	42.50	57.50	1	99
Female	42.20	69.30	25.90	74.10	5.30	94.70	7	99.30	40.90	59.10	10	99.30
P-Value	>0.05		0.007		0.0014		>0.05		>0.05		>0.05	

Pos.: positive, Neg.: negative. *Values are percentages.

Table 2. **The distribution of endoscopy symptoms with age and BMI**

Disease	Age					BMI				
	Positive		Negative			Positive		Negative		
	Mean	SD	Mean	SD	*P*-value	Mean	SD	Mean	SD	*P*-value
Hiatus hernia	40.89	10.68	40.87	10.55	>0.05	45.36	5.93	45.67	6.51	>0.05
Esophageal ulcer	44.06	10.95	40.68	10.53	0.002	45.73	6.89	45.55	6.29	>0.05
Peptic ulcer	41.71	10.24	40.87	10.59	>0.05	45.26	8.43	45.57	6.31	>0.05
H. pylori	42.73	10.06	45.77	6.21	0.0001	45.77	45.41	6.21	6.42	>0.05
Polyp	39.15	9.69	46.63	7.74	>0.05	46.63	7.74	45.56	6.32	>0.05
Esophagitis	41.79	10.72	40.54	10.52	0.032	45.37	5.88	45.65	6.51	>0.05

Table 3. **Comparison of our results with similar studies***

	Present study	Spain study, 2006	Chili study, 2007	Brazil study, 2009	UAE study, 2010	Belgium study, 2013
H. pylori infection	41	69	53	53	85	17
Hiatal hernia	31	-	-	-	13	24
Esophagitis	27.3	-	-	-	-	30
Esophageal ulcer	6	-	-	-	-	-
Peptic ulcer	0.8	1	2	3	-	7
Gastric polyp	0.8	-	-	-	-	-
Gastritis	-	-	-	-	67	36

*All values are in percentages.

In one study done by Al-Akwaa et al.[6] in UAE in 2010, 62 patients were enrolled in that study that 85.5% were positive for *H. pylori* infection and 67.7% had gastritis and 13% has hiatus hernia.[6] In current study, 31% of patients had hiatus hernia and 41% were positive for *H. pylori* infection that were almost half of the rate of infection in comparison with current study. Hiatal hernia in our study was higher and due to its role in the type of surgery, endoscopy can be useful.

de Palma et al. in Italia published a review article in 2012 which proclaim that it cannot be definitely recommend to do upper GI endoscopy before bariatric surgery and the need to conduct further studies in this field indicates the importance of our survey.[7]

In retrospective study that conducted by Praveenraj et al.[8] from India in 2015, 283 patients were enrolled that 54 patients (54.4%) had an abnormal findings in endoscopy and hiatus hernia in 2 patients was observed. In current research, the incidence of positive cases were less but the hiatus hernia was more prevalent. The high prevalence of hiatal hernia in our study increases the need for endoscopy.

Csendes et al. from Chili in 2007 evaluated 426 candidate for bariatric surgery in pre-operative endoscopy, 55% had a positive criteria 2.6% had peptic ulcer. *H. pylori* infection was 53% in the patients.[9] Peptic ulcer was high incidence in current study, whereas *H. pylori* positive cases has higher than Chili's survey.

In retro prospective study conducted by D'Hondt et al.[10] from Belgium in 2013, 652 patients were enrolled in that survey, 68.1% had an abnormal finding in endoscopy results, 24.3% had hiatus hernia, esophagitis was observed in 30.8%, and gastritis in 36.2% and ulcer in 7.5% of patients; and 17.6% were positive for *H. pylori* infection. All cases in this study was higher than our research but the incidence of *H. pylori* infection due to low level of health condition in Iran was higher than this study.

Our study has some limitation that just conducted in one obesity center and the endoscopy performed by multi-specialist; but this cannot affect our result because the pathologic findings are objective and can be detected by each specialist. But overall for the first time, the large sample, about 1663 cases, were examined during 1 year.

Conclusion

In conclusion, this is inferred that about 1/3 of obese patients that were candidate for bariatric surgery had an accidental findings in esophagus and stomach endoscopy (35%), so administration of upper GI tract endoscopy before bariatric surgery is may be useful for selecting the type of appropriate procedure for the obese patients. At last, it is proposed that to achieve more accurate results that could be cited or generalized, conduct multicenter studies with larger sample sizes.

Acknowledgments

This study has been funded and supported by Iran university of medical sciences (IUMS); Grant no 91-01-140-17375. We used data from National Obesity Surgery Database, Iran, Tehran. We would like to express our thanks from National Obesity Surgery Database team who prepared us useful data.

Conflict of Interest

None.

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