ORIGINAL RESEARCH

Assessment of occurrence of dyslipidemia & obesity in patients with gastrojejunostomy

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ABSTRACT

Background: Obesity has well-known negative effects, such as comorbid conditions including dyslipidemia, type 2 diabetes, and hypertension. The present study was conducted to assess occurrence of dyslipidemiain patients with gastrojejunostomy. **Materials & Methods:** 45 patients who underwent gastrojejunostomy of both genders were selected. Cases were kept in group I and age matched control in group II. Details of weight, presence of co-morbidities like DM, dyslipidemia and cirrhosis were obtained. **Results:** There were 22 males and 23 females in group I and 21 males and 24 females in group II. BMI was 19.3 kg/m2 in group I and 20.1 kg/m2 in group II. The occurrence of diabetes was seen in 3 in group I and 8 in group II, dyslipidemia in 2 in group I and 6 in group II, cirrhosis 5 in group II and hypertension 3 in group I and 9 in group II. The difference was significant ($P< 0.05$). In group I and group II, mean WBC count (cells/mm3) count was 9188.2 and 8124.5, Hb (gm/dL) was 9.5 and 10.2, ESR (mm/hour) was 30.5 and 23.2, RBS (mg/dL) was 98.4 and 95.2, triglyceride (mg/dL) was 335.4 and 164.3, cholesterol (mg/dL) was 256.2 and 210.6 and LDL (mg/dL) was 164.2 and 150.0 respectively. The difference was significant ($P< 0.05$). Diagnosis was dyspeptic symptoms in 27, anaemia in 8, malena in 5, pain abdomen in 3 and primary malignancy in 2 cases. **Conclusion:** In patients with GJ, the prevalence of obesity, diabetes, and dyslipidemia is reduced. The complicated changes in gut hormones brought on by GJ's food bypass may contribute to the lower prevalence of DM and obesity.

Keywords: Diabetes, Hypertension, Obesity

INTRODUCTION

Obesity has well-known negative effects, such as comorbid conditions including dyslipidemia, type 2 diabetes, and hypertension. Aside from medicine and lifestyle changes, bariatric surgery is one of the most successful treatment methods.[1] It is now generally acknowledged that the pathophysiology of bariatric procedures involves weight loss, calorie restriction, and the manipulation of foregut and hindgut hormones after anatomic modification.[2] Among them, changes in gut hormones are thought to be crucial because they aid in glucose metabolism and weight loss. RYGB has the greatest reduction in weight loss among bariatric procedures.[3]

It is commonly known that improving early and late glucose metabolism following surgery requires higher levels of hindgut hormones like Glucagon Like Peptide-1 (GLP-1) and Peptide YY (PYY) and lower levels of foregut hormones such glucose dependent insulinotrophic peptide (GIP). However, because to the invasive nature of bariatric procedures, there aren't many research.[4,5] Additionally, because gastrojejunostomy has fewer technical requirements and fewer risks than Roux-en-Y Gastric Bypass (RYGB), it has historically been the most often done surgery for duodenal ulcers and gastric antral cancer.Some studies indicated that Billroth II gastrojejunostomy was effective in glucose control in non- obese T2DM patients with gastric cancer or gastric ulcer.[6]The present study was conducted to assess occurrence of dyslipidemia in patients with gastrojejunostomy.

MATERIALS & METHODS

The study was carried out on 45 patients who underwent gastrojejunostomy of both genders. All gave their written consent to participate in the study.

Data such as name, age, gender etc. was recorded. Cases were kept in group I and age matched control in group II. Details of weight, presence of co-morbidities like DM, dyslipidemia and cirrhosis were obtained. All of the patients had lipid abnormalities, which were categorized appropriately. Patients were diagnosed with dyslipidemia if there was even one anomaly in

their fasting lipid profile, such as serum cholesterol, triglycerides, or LDL cholesterol. European norms were used to define hypertension.Results thus obtained were subjected to statistical analysis. P value < 0.05 was considered significant.

RESULTS

Table I Comparison of parameters

Parameters	Group I	Group II	P value
Gender (M:F)	22:23	21:24	0.91
BMI (kg/m2)	19.3	20.1	0.72
DM	3	8	0.01
Dyslipidemia	2	6	0.02
Cirrhosis	0	5	0.03
Hypertension	3	9	0.05

Table I shows that there were 22 males and 23 females in group I and 21 males and 24 females in group II. BMI was 19.3 kg/m2 in group I and 20.1 kg/m2 in group II. The occurrence of diabetes was seen in 3 in group I and 8 in group II, dyslipidemia in 2 in group I and 6 in group II, cirrhosis 5 in group II and hypertension 3 in group I and 9 in group II. The difference was significant (P< 0.05).

Table II Haematological parameters

Parameters	Group I	Group II	P value
WBC count (cells/mm3)	9188.2	8124.5	0.63
Hb (gm/dL)	9.5	10.2	0.85
ESR (mm/hour)	30.5	23.2	0.01
RBS (mg/dL)	98.4	95.2	0.52
Triglyceride (mg/dL)	335.4	164.3	0.01
Cholesterol (mg/dL)	256.2	210.6	0.05
LDL (mg/dL)	164.2	150.0	0.76

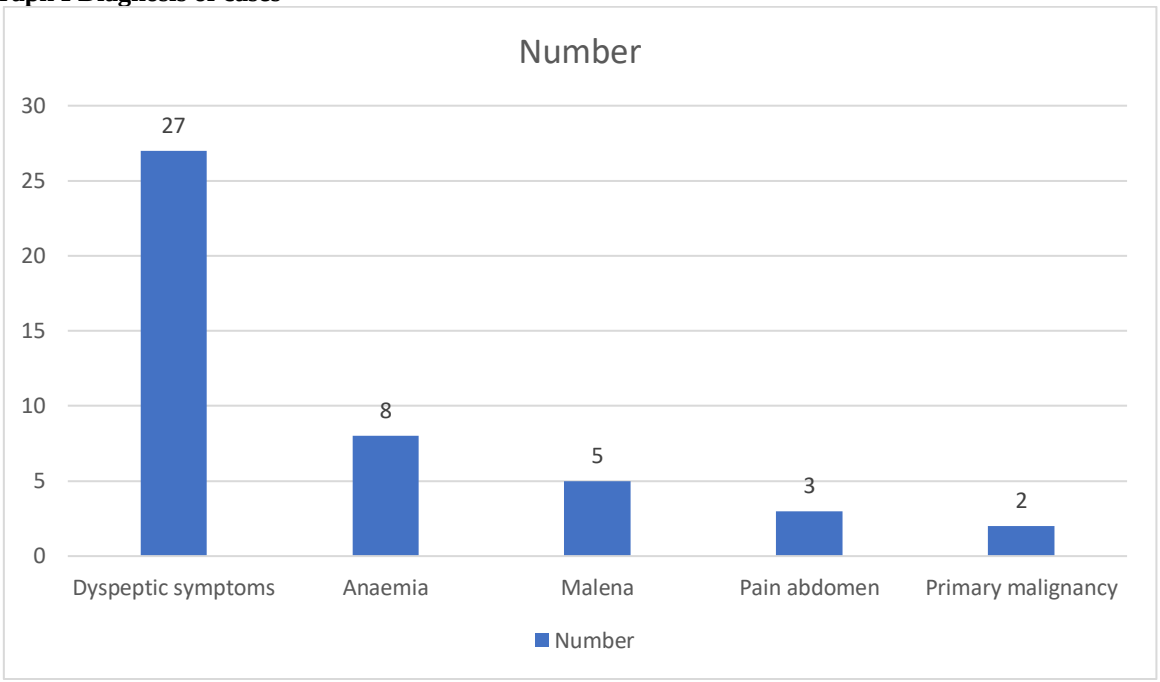
Table II shows that in group I and group II, mean WBC count (cells/mm3) count was 9188.2 and 8124.5, Hb (gm/dL) was 9.5 and 10.2, ESR (mm/hour) was 30.5 and 23.2, RBS (mg/dL) was 98.4 and 95.2, triglyceride (mg/dL) was 335.4 and 164.3, cholesterol (mg/dL) was 256.2 and 210.6 and LDL (mg/dL) was 164.2 and 150.0 respectively. The difference was significant (P< 0.05).

Table III Diagnosis of cases

Diagnosis	Number	P value
Dyspeptic symptoms	27	0.05
Anaemia	8	
Malena	5	
Pain abdomen	3	
Primary malignancy	2	

Table III, graph I shows that diagnosis was dyspeptic symptoms in 27, anaemia in 8, malena in 5, pain abdomen in 3 and primary malignancy in 2 cases.

Graph I Diagnosis of cases



DISCUSSION

A gastrojejunostomy is a surgical procedure where a new connection is created between the stomach and the jejunum (the second part of the small intestine).[7,8]This is typically done to bypass part of the stomach or duodenum, often due to issues such as gastric outlet obstruction, peptic ulcers, or gastric cancer.[9,10]In the procedure, the surgeon creates an opening from the stomach to the jejunum, allowing food to bypass the obstructed or damaged area, and helping improve digestion and nutrient absorption.[11,12]
We found that there were 22 males and 23 females in group I and 21 males and 24 females in group II. BMI was 19.3 kg/m2 in group I and 20.1 kg/m2 in group II. The occurrence of diabetes was seen in 3 in group I and 8 in group II, dyslipidemia in 2 in group I and 6 in group II, cirrhosis 5 in group II and hypertension 3 in group I and 9 in group II. Kumar et al[13]determined the prevalence of obesity, dyslipidemia and Diabetes Mellitus (DM) in patients with GJ. A total of 68 patients were studied. Mean age of patients was 64.01±10.2 years with males predominating the population (92.6%). The most common three reasons for presentation in gastroenterology were dyspeptic symptoms 32 (47%), evaluation of anaemia 12 (17.6%), and history of malena 10 (14.7%). Prevalence of diabetes was significantly less in patients with GJ (2.9% vs 22%). Obesity and dyslipidemia was also common in patients without GJ (7.3%), with p-value <0.05.
We found that in group I and group II, mean WBC count (cells/mm3)count was 9188.2 and 8124.5, Hb (gm/dL) was 9.5 and 10.2, ESR (mm/hour) was 30.5 and 23.2, RBS (mg/dL) was 98.4 and 95.2, triglyceride (mg/dL) was 335.4 and 164.3, cholesterol (mg/dL)was 256.2 and 210.6 and LDL (mg/dL) was 164.2 and 150.0 respectively. Paterli et al[14] in their study outcomes of LRYGB and LSG patients were compared, focusing on possibly responsible mechanisms. Twelve patients were randomized to LRYGB and 11 to LSG. These non-diabetic patients were investigated before and 1 week, 3 months, and 12 months after surgery. A standard test meal was given after an overnight fast, and blood samples were collected before, during, and after food intake for hormone profiles (cholecystokinin (CCK), ghrelin, glucagon-like peptide 1 (GLP-1), peptide YY (PYY)). In both groups, body weight and BMI decreased markedly and comparably leading to an identical improvement of abnormal glycemic control (HOMA index). Post-surgery, patients had markedly increased postprandial plasma GLP-1 and PYY levels ($p < 0.05$) with ensuing improvement in glucose homeostasis. At 12 months, LRYGB ghrelin levels approached preoperative values. The postprandial, physiologic fluctuation returned, however, while LSG ghrelin levels were still markedly attenuated. One year postoperatively, CCK concentrations after test meals increased less in the LRYGB group than they did in the LSG group, with the latter showing significantly higher maximal CCK concentrations ($p < 0.012$ vs. LRYGB).
We found that diagnosis was dyspeptic symptoms in 27, anaemia in 8, malena in 5, pain abdomen in 3 and primary malignancy in 2 cases. Choi et al[15]compared the effect of diabetes control induced by Roux-en-Y gastrojejunostomy(RY) vs Billroth-I reconstruction(BI) after distal gastrectomy in patients with early gastric cancer(EGC) and type 2 diabetes(T2DM). Forty EGC patients with T2DM, aged 20-80 years, who were expected to undergo curative distal gastrectomy were randomized 1:1 to

RY(n = 20) or BI(n = 20). Diabetes medication status, biochemical and hormonal data including blood glucose, HbA1c, insulin, C-peptide, HOMA-IR, ghrelin, leptin, GLP-1, PYY, and GIP were evaluated for 12 months after surgery. Although pre- and postoperative 12-month fasting and postprandial glucose levels did not show a significant difference, HbA1c, C-peptide, and HOMA-IR levels were significantly improved at 12 months after surgery in both BI and RY groups. Sixty percent of RY patients and 20% of BI patients decreased their medication satisfying FBS<126 mg/dL and HbA1c<6.5% and 5% of BI patients stopped their medication satisfying the criteria of FBS<126 mg/dL and HbA1c<6.0%. The improvement patterns were more sustainable with less fluctuation in RY than in BI. On hormonal analysis, ghrelin and leptin levels were decreased and PYY and GIP levels were increased at 12 months after surgery in both groups without significant difference according to the reconstruction type and diabetic improvement status except ghrelin. In gastric cancer surgery, RY reconstruction showed better and more durable diabetes control compared to BI during the first year after surgery. Gastric cancer surgery led to decreased ghrelin and leptin and increased PYY and GIP, which might have a role in improving insulin resistance and glucose homeostasis.

The shortcoming of the study is small sample size.

CONCLUSION

Authors found that in patients with GJ, the prevalence of obesity, diabetes, and dyslipidemia is reduced. The complicated changes in gut hormones brought on by GJ's food bypass may contribute to the lower prevalence of DM and obesity.

REFERENCES

1. Behl S, Misra A. Management of obesity in adult Asian Indians. Indian Heart J. 2017;69(4):539-44.
2. Caiazzo R, Zerrweck C, Verhaeghe R, Hubert T, Arnalsteen L, Pattou F. Gastric bypass and glucose metabolism. Diabetes Metab. 2009;35:528e53.
3. Classification and Diagnosis of Diabetes: Standards of Medical Care in Diabetes2019. American Diabetes Association. Diabetes Care. 2019;42 (Suppl 1):S13-S28. Doi: 10.2337/dc19-S002.
4. Jellinger PS, Handelsman Y, Rosenblit PD, Bloomgarden ZT, Fonseca VA, Garber AJ, et al. American Association of Clinical Endocrinologists and American College of Endocrinology guidelines for management of dyslipidemia and prevention of cardiovascular disease. EndocrPract. 2017;23:01-87.
5. Mancia G, Fagard R, Narkiewicz K, Redon J, Zanchetti A, Bohm M, et al. 2013 ESH/ESC Guidelines for the management of arterial hypertension. J Hypertens. 2013;31(7):1281-357.
6. Ahirwar R, Mondal PR. Prevalence of obesity in India: A systematic review. Diabetes Metab Syndr. 2019;13(1):318-21.
7. Tripathy JP, Thakur JS, Jeet G, Chawla S, Jain S, Pal A, et al. Prevalence and risk factors of diabetes in a large community-based study in North India: Results from a STEPS survey in Punjab, India. DiabetolMetab Syndr. 2017;9:8. https:// doi.org/10.1186/s13098-017-0207-3.
8. Yang J, Li C, Liu H, Gu H, Chen P, Liu B. Effects of subtotal gastrectomy and Roux-en-Y gastrojejunostomy on the clinical outcome of type 2 diabetes mellitus. J Surg Res. 2010;164:e67-71.
9. Lakdawala M, Shaikh S, Bandukwala S, Remedios C, Shah M, Bhasker AG. Roux-en-Y gastric bypass stands the test of time: 5-year results in low body mass index (30-35 kg/m (2)) Indian patients with type 2 diabetes mellitus. SurgObesRelat Dis. 2013;9:370-78.
10. Gloy VL, Briel M, Bhatt DL, Kashyap SR, Schauer PR, Mingrone G, et al. Bariatric surgery versus non-surgical treatment for obesity: A systematic review and metaanalysis of randomised controlled trials. BMJ. 2013;347:f5934.
11. Arumalla K, Singla V, Aggarwal S, Garg H, Goel R, Katiyar V. Outcomes in morbidly obese adolescent patients undergoing laparoscopic sleeve gastrectomy in the Indian subcontinent: A retrospective review. J Min Access Surg. 2019;15:31-36.
12. Ko GTC, Tang JSF. Waist circumference and BMI cut-off based on 10-year cardiovascular risk: Evidence for central pre-obesity. Obesity. 2007;15:2832-40.
13. KUMAR KS, SASIDHARAN A. Prevalence of Obesity, Dyslipidemia and Diabetes Mellitus in Patients with Gastrojejunostomy. Journal of Clinical & Diagnostic Research. 2021 May 1;15(5).
14. Peterli R, Steinert RE, Woelnerhanssen B, Peters T, Christoffel-Courtin C, Gass M, Kern B, von Fluee M, Beglinger C. Metabolic and hormonal changes after laparoscopic Roux-en-Y gastric bypass and sleeve gastrectomy: A randomized, prospective trial. Obesity surgery. 2012 May;22:740-8.
15. Choi YY, Noh SH, An JY. A randomized controlled trial of Roux-en-Y gastrojejunostomy vs. gastroduodenostomy with respect to the improvement of type 2 diabetes mellitus after distal gastrectomy in gastric cancer patients. PLoS One. 2017;12(12): 0188904.