

An invited commentary on ‘Comparative analysis of weight loss and resolution of comorbidities between laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass: A systematic review and meta-analysis based on 18 studies’ (Int J Surg 2020;76:101-110) – Need for re-examining

Sayed Fida Hussain Shah^a, Syed Ghulam Sarwar Shah^{b,c,*}

^aDepartment of Surgery, Minimal Invasive Surgical Centre, Bilawal Medical College, Liaquat University of Medical and Health Sciences, Jamshoro, 76090, Sindh, Pakistan

^bNIHR Oxford Biomedical Research Centre, Oxford University Hospitals NHS Foundation Trust, John Radcliffe Hospital, Headington Way, Headington, Oxford, OX3 9DU, England, UK

^cRadcliffe Department of Medicine, University of Oxford, John Radcliffe Hospital, Headington Way, Headington, Oxford OX3 9DU, England, UK

*Corresponding author, E-mail address: Sarwar.Shah@ouh.nhs.uk (S.G.S. Shah).

ARTICLE INFO

Keywords:

Bariatric surgery
Body mass index (BMI)
Laparoscopy
Gastrectomy
Meta-analysis
Metabolic surgery
Non-communicable disease
Obesity
Obesity management
Systematic review
Weight loss

Obesity refers to the condition of excessive fat accumulation in the body, commonly in the subcutaneous tissues [1]. It is determined by a value for the body mass index (BMI), which can be measured by the formula [2]:

$$BMI = \frac{\text{Weight in kg}}{(\text{Height in m})^2}$$

For adults, a BMI of ≥ 30.0 defines obesity [3]. BMI is categorised into different categories: <18.5 (underweight), $18.5\text{--}24.9$ (normal weight), $25.0\text{--}29.9$ (overweight / pre-obesity), $30.0\text{--}34.9$ (Obesity level I), $35.0\text{--}39.9$ (Obesity level II) and ≥ 40 (Obesity level III) [2,4].

Obesity is recognised as a chronic non-communicable disease[5] and is increasing in epidemic proportions in many countries [6] including the US [7], UK [8], China [9] and the Arabian Gulf countries [10].

Obesity is prevalent in people irrespective of age, gender, ethnicity or socio-economic conditions [11]. Obesity may lead to difficulties with routine daily activities, socio-psychological problems, serious health conditions such as type 2 diabetes, cardiovascular disease (CVD) and other life-threatening conditions, with the potential to reduce life expectancy [3]. Thus, managing obesity is important and possible.

Obesity could be tackled by weight loss through different types of interventions such as lifestyle changes and surgical procedures known as bariatric or metabolic surgery [12]. In treatment of obesity, the most common weight loss surgical procedures are gastric band, gastric bypass and sleeve gastrectomy, which have benefits and risks [12] that must be considered beforehand in order that informed choices can be made.

A recent systematic review and meta-analysis by Han et al. [13] compared the laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en-Y gastric bypass (LRYGB) in terms of their impact on weight loss (defined by reduction in the BMI) and concomitant risks of the procedures. BMI was measured after 30 months (mid-term) and 60 months (long-term) following the procedures alongside any complications such as bleeding, leakage, wound infection, or death following these procedures. Han et al. [13] found no significant difference between LSG and LRYGB in loss of 'substantial' weight in both the short and long term or resolution of type 2 diabetes. They found fewer postoperative complications and reoperation rates in the LSG and better management of gastroesophageal reflux, dyslipidemia and hypertension in the LRYGB [13].

We have observed discrepancies in the study by Han et al. [13]. Data on BMI for seven out of nine RCTs: Kehagias et al. (2011), Keidar et al. (2013), Nogues et al. (2010), Salminen et al. (2018), Schauer et al. (2014), Yang et al. (2015) and Zhang et al. (2014) reported in Table 1 do not match with the data shown in the Forest plot (Figure 2) published by Han et al. [13]. In addition, data on BMI for all NRSI studies in Table 2 and Figure 3 (Forest plot) in their study also do not match with each other. These inconsistencies show serious limitations and reservations about the findings reported by Han et al. [13].

We took data on BMI for all RCTs from Table 2 reported by Han et al. [13] and ran a meta-analysis which revealed that overall LRYGB was more effective than LSG in reducing weight / BMI (standardised mean differences (SMDs) 0.16; 95% confidence interval (CI): 0.03, 0.29; $P = 0.02$) (Figure 1 - Forest plot panel A). However, there were no significant differences between LSG and LRYGB in terms of reducing weight / BMI at both the mid-term (SMD 0.19; 95% CI: -0.03, 0.40; $P = 0.09$) and the long-term (SMD 0.14; 95% CI: -0.04, 0.32; $P = 0.013$) follow-up. (Figure 1 - Forest plot panel B).

Our review suggest Han et al. [13] might re-examine their findings and conclusions.

Provenance and peer review

Invited Commentary, internally reviewed.

Conflict of interest

Authors declare no conflict of interest.

Acknowledgements

The research work by SGSS is supported by the National Institute for Health Research (NIHR) Oxford Biomedical Research Centre (BRC). The views expressed are those of the authors and not necessarily of their employer organisations.

References:

- [1] E.A. Martin, ed., Concise Medical Dictionary, 8th ed., Oxford University Press, Oxford, 2010.
- [2] World Health Organisation, Body mass index - BMI, WHO Regional Office for Europe, Copenhagen, Denmark. (2020). <http://www.euro.who.int/en/health-topics/disease-prevention/nutrition/a-healthy-lifestyle/body-mass-index-bmi> (accessed May 3, 2020).
- [3] NHS UK, Obesity, (2019). <https://www.nhs.uk/conditions/obesity/> (accessed May 3, 2020).
- [4] S. Gao, J. Juhaeri, S. Reshef, W.S. Dai, Association between body mass index and suicide, and suicide attempt among British adults: The health improvement network database, Obesity. 21 (2013) E334–E342. <https://doi.org/10.1002/oby.20143>.
- [5] J.Q. Purnell, Definitions, Classification, and Epidemiology of Obesity, in: Endotext, MDText.com, Inc, South Dartmouth, MA, 2018.
- [6] World Health Organisation, Obesity and overweight, World Health Organisation, Geneva, Switzerland, 2020. <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight> (accessed May 3, 2020).
- [7] C.M. Hales, M.D. Carroll, C.D. Fryar, C.L. Ogden, Prevalence of Obesity and Severe Obesity Among Adults: United States, 2017–2018, National Center for Health Statistics, Centers for Disease Control and Prevention, 2020. <https://www.cdc.gov/nchs/products/databriefs/db360.htm> (accessed May 3, 2020).
- [8] C. Baker, Obesity Statistics, The House of Commons Library, London, 2019. <https://commonslibrary.parliament.uk/research-briefings/sn03336/> (accessed May 3, 2020).
- [9] Y. Wang, H. Xue, M. Sun, X. Zhu, L. Zhao, Y. Yang, Prevention and control of obesity in China, Lancet Glob Health. 7 (2019) e1166–e1167. [https://doi.org/10.1016/S2214-109X\(19\)30276-1](https://doi.org/10.1016/S2214-109X(19)30276-1).
- [10] A. Samara, P.T. Andersen, A.R. Aro, Health Promotion and Obesity in the Arab Gulf States: Challenges and Good Practices, J Obes. (2019) 4756260. <https://doi.org/10.1155/2019/4756260>.
- [11] A. Lee, M. Cardel, W.T. Donahoo, Social and Environmental Factors Influencing Obesity, in: Endotext, MDText.com, Inc, South Dartmouth, MA, 2019.
- [12] NHS UK, Weight loss surgery, (2020). <https://www.nhs.uk/conditions/weight-loss-surgery/> (accessed May 3, 2020).
- [13] Y. Han, Y. Jia, H. Wang, L. Cao, Y. Zhao, Comparative analysis of weight loss and resolution of comorbidities between laparoscopic sleeve gastrectomy and Roux-en-Y gastric bypass: A systematic review and meta-analysis based on 18 studies, Int J Surg. 76 (2020) 101–110. <https://doi.org/10.1016/j.ijssu.2020.02.035>.

Figure 1 - Forest plot panel A. (Comparison of excess weight loss / BMI between LRYGB and LSG based on RCTs)

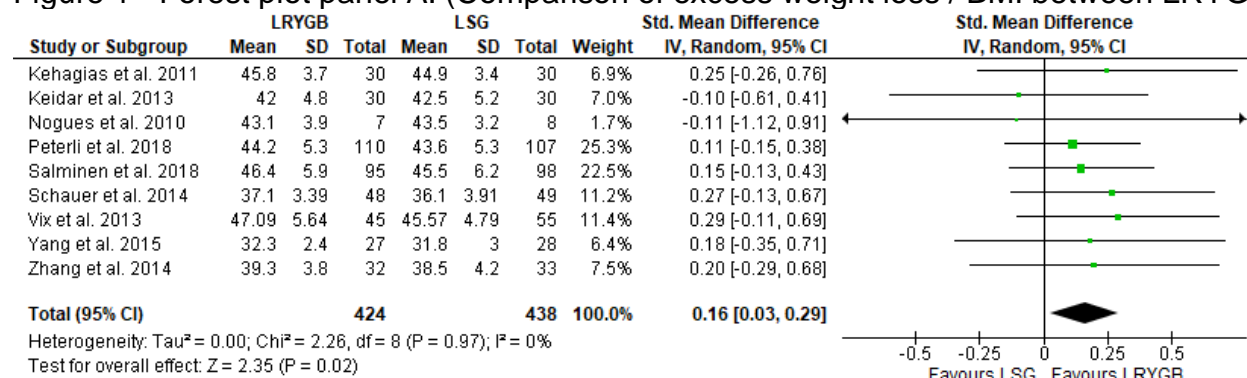


Figure 1 - Forest plot panel B: Sub—group analysis (comparison of excess weight loss / BMI between LRYGB and LSG based on RCTs)

