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Influence of polish national COVID-19 lockdown on the patient characteristics and outcomes of bariatric surgery at a high-volume center—A cohort study

ARTICLE INFO

Keywords
Bariatric Surgery, COVID-19 Lockdown Outcomes

ABSTRACT

Introduction: As a result of the COVID-19 pandemic, the health care systems around the world have been overburdened resulting in significant reduction of planned surgical procedures such as bariatric surgeries. The primary aim of this study is to assess the influence of the COVID-19 national lockdown in Poland on the short-term outcomes and intraoperative course of bariatric patients in a high volume IFSO certified bariatric center.

Material & methods: This is a retrospective analysis of 158 bariatric surgery patients, who underwent bariatric procedures either prior to or after the first national lockdown in Poland. The patients were categorized as pre-lockdown group and the post-lockdown group, each comprising of 79 patients.

Results: The post-lockdown group had significantly lower operative weight (105.76 vs 114.25, p = 0.012) and BMI (36.99 vs 39.93, p = 0.005) compared to pre-lockdown group. The primary length of stay was significantly longer in the post-lockdown group (3.04 vs 2.44, p = 0.001). The post-lockdown group had significantly lower mean CGI score (1.90 vs 6.67, p = 0.046) and less short-term readmissions post-discharge (0 vs 8.86, p = 0.007) than pre-lockdown group.

Conclusion: The post-lockdown group was found to have lower body weight and BMI on the day of the operation than those operated prior to the lockdown. These findings are conflicting to previous research assessing weight changes during lockdowns. Since the qualification criteria and order of operations were similar and pre-defined for both groups, possible explanations for these findings are higher patient motivation due to COVID-19 fears and longer preparation period due to elective surgery postponement. We encourage bariatric centers globally to assess the effect of national lockdowns on the patient profiles as well as the psychological and behavioral impact on the bariatric cohort.

Introduction

In 2020, the SARS-COV2 virus spread around the world causing a global pandemic.

To curb the spread of the virus, many countries have instituted nation-wide lockdowns, which has negatively impacted patients being prepared for bariatric surgery [1-3]. Our clinic, a high volume IFSO (International Federation for the Surgery of Obesity and Metabolic Disorders) certified bariatric center, performs around 400 bariatric surgeries annually. During the 1st Polish lockdown (12/03/2020 to 16/05/2020 (65 days)), all the elective non-oncological surgeries were entirely postponed. The primary aim of this study is to assess the influence of COVID-19 related national lockdown on the short-term outcomes and intraoperative course of bariatric patients.

Material & methods

This is a cohort study including 158 patients, who underwent bariatric surgery at the Department of General, Endocrine and Transplant Surgery, Medical University of Gdansk, Poland. All patients were qualified in accordance to IFSO and Bariatric Chapter of the Association of Polish Surgeons guidelines [4,5]. These patients were divided into two groups – pre-lockdown group (79 patients operated from 1st January 2020 until 12th March 2020) and post-lockdown group (additional 79 patients operated between 16th May 2020 until the same number of patients as pre-lockdown group were recruited). The patient charts were retrospectively reviewed to collect data. The postoperative outcomes include length of hospital stay (LOS), Clavien–Dindo Classification (CDC) [6,7], rehospitalization rate were collected. Additionally, the comprehensive complication index (CCI) indicates patient-specific cumulative complication burden was calculated ( www.accesssurgery.com ). The normality of distribution was analyzed using Shapiro–Wilk Test. The quantitative variables were analyzed using chi-square test. The qualitative variables were analyzed using the Kruskal Wallis test or Mann–Whitney U test. The statistical significance was assumed if P-value was <0.05. Statistical analysis was performed using SPSS Statistics 25.0 (IBM Inc., Armonk, NY, USA).

Results

The mean age of patients in the pre-lockdown and post-lockdown group was 42.77 and 41.18 years, respectively (p = 0.335). The majority of patients in both groups were females (76.12% vs 79.75%, p = 0.598). The post-lockdown group had significantly lower mean operative weight (105.76 vs 114.25, p = 0.012) and BMI (36.99 vs 39.93, p = 0.005). However, groups were similar with regards to maximum BMI, weight, and height. The groups were also similar in prevalence of different comorbidities (Table 1).
Discussion

Contrary to contemporary literature [8], our analysis shows that the post-lockdown cohort have lower body weight and BMI on the day of the operation than those operated prior to the lockdown. However, the burden of comorbid conditions remained similar, regardless of the period. A possible explanation is the change in attitude of patients towards their own safety and health concerns. However, recent survey studies have associated national lockdown periods with poorer weight control, reduced physical activity, and increased binge eating [9,10]. Since the qualification criteria for bariatric surgery at our institution did not change it is difficult to ascertain the cause of reduced operative BMI and weight. Furthermore, there were no patients lost-to-follow up during the lockdown period, with all patients undergoing surgery as scheduled listed in our pre-determined institutional operation list, apart from patients who were diagnosed with COVID-19 or refused operation due to fear of SARS-COV-2. Our study presents an unexpected finding of improved treatment outcomes in the post-lockdown patients, with significantly fewer early readmissions, and lower CCI scores. As shown, in our study, the post-lockdown population group had a lower mean operative body weight and BMI, thus, contributing to the lowering of complication risk [11]. Regardless of better outcomes, the post-lockdown required longer hospital stay probably due the safety and epidemiological protocols instituted during the ongoing pandemic.

The findings of our study are contradictory to reports regarding weight changes during the lockdown period. A possible explanation is the change in attitude of patients to ward their own safety and health concerns. However, recent survey studies have associated national lockdown periods with poorer weight control, reduced physical activity, and increased binge eating [9,10]. Since the qualification criteria for bariatric surgery at our institution did not change it is difficult to ascertain the cause of reduced operative BMI and weight. Furthermore, there were no patients lost-to-follow up during the lockdown period, with all patients undergoing surgery as scheduled listed in our pre-determined institutional operation list, apart from patients who were diagnosed with COVID-19 or refused operation due to fear of SARS-COV-2. Our study presents an unexpected finding of improved treatment outcomes in the post-lockdown patients, with significantly fewer early readmissions, and lower CCI scores. As shown, in our study, the post-lockdown population group had a lower mean operative body weight and BMI, thus, contributing to the lowering of complication risk [11]. Regardless of better outcomes, the post-lockdown required longer hospital stay probably due the safety and epidemiological protocols instituted during the ongoing pandemic.

In conclusion, our retrospective analysis found the post-lockdown patients to have significantly lower operative BMI and weight as well as better postoperative outcomes compared to the pre-operative group. The findings of our study are contradictory to reports regarding weight changes during the lockdown period.

Ethical statement

All procedures performed in studies involving human participants

Table 1
Prevalence of comorbidities in pre-lockdown and post-lockdown group. (COPD = chronic obstructive pulmonary disease, GERD = gastroesophageal reflux disease, OSAS = obstructive sleep apnea syndrome, PCOS = polycystic ovary syndrome).

| Comorbidity                             | Pre-lockdown (N = 79) | Post-lockdown (N = 79) | p-value |
|----------------------------------------|-----------------------|------------------------|---------|
| Hypertension                           | 38 48.10%             | 26 32.91%              | 0.152   |
| COPD/Asthma                            | 7 8.86%               | 11 13.92%              | 0.317   |
| Diabetes mellitus II                   | 15 18.99%             | 17 21.52%              | 0.692   |
| Cardiological disorders                | 4 5.06%               | 5 6.33%                | 0.731   |
| GERD                                   | 16 20.25%             | 11 13.92%              | 0.291   |
| OSAS                                   | 10 12.66%             | 7 8.86%                | 0.441   |
| Active/≤6 months nicotine addiction   | 22 27.85%             | 15 18.99%              | 0.189   |
| Insulin resistance                     | 12 15.19%             | 11 13.92%              | 0.822   |
| Dyslipidemia                           | 8 10.13%              | 8 10.13%               | 1.000   |
| Chronic kidney failure                 | 2 2.53%               | 0 0.00%                | 0.155   |
| Depression                             | 3 3.80%               | 6 7.59%                | 0.303   |
| Hypothyroidism                         | 16 20.25%             | 22 27.85%              | 0.264   |
| Joint & bones                          | 12 15.19%             | 9 11.39%               | 0.482   |
| PCOS                                   | 1 1.27%               | 3 3.80%                | 0.311   |
| Anticoagulants prior to surgery        | 5 6.33%               | 2 2.53%                | 0.246   |

Table 2
Details regarding operative management and complications. (LSG = laparoscopic sleeve gastrectomy, OAGB = one anastomosis gastric bypass, RYGB = Roux-en-Y gastric bypass, IFSO = International Federation for the Surgery of Obesity and Metabolic Disorders, GS = general surgery, CCI = comprehensive complication index).

| Complication                                | Pre-lockdown (N = 79) | Post-lockdown (N = 79) | p-value |
|---------------------------------------------|-----------------------|------------------------|---------|
| Type of surgery                             |                       |                        |         |
| LSG                                         | 45 79.31%             | 60 75.95%              | 0.220   |
| OAGB                                        | 16 25.00%             | 11 13.92%              |         |
| RYGB                                        | 1 1.56%               | 5 6.33%                |         |
| Band removal                                | 2 3.13%               | 3 3.80%                |         |
| Operator                                    |                       |                        |         |
| IFSO certificated                           | 46 58.23%             | 50 63.29%              | 0.076   |
| GS specialist                               | 30 37.97%             | 20 25.32%              |         |
| Resident                                    | 3 3.80%               | 9 11.39%               |         |
| Operation time [Minutes]                    | 61.14 ± 20.88         | 56.76 ± 18.54          | 0.159   |
| Readmission <14 days                        |                       |                        |         |
| No                                          | 72 91.14%             | 79 100.00%             |         |
| Yes                                         | 7 8.86%               | 0 0.00%                |         |
| Readmission 15–30 days                      |                       |                        |         |
| No                                          | 77 97.47%             | 79 100.00%             |         |
| Yes                                         | 2 2.53%               | 0 0.00%                |         |
| Complications >30 days                      |                       |                        |         |
| No                                          | 72 91.14%             | 77 97.47%              | 0.086   |
| Yes                                         | 7 8.86%               | 2 2.53%                |         |
| Clavien-Dindo classification <30 days        |                       |                        |         |
| I                                           | 1 1.27%               | 2 2.53%                |         |
| II                                          | 5 6.33%               | 2 2.53%                |         |
| IIIa                                        | 6 7.59%               | 0 0.00%                |         |
| IIib                                        | 1 1.27%               | 2 2.53%                |         |
| IV                                          | 1 1.27%               | 0 0.00%                |         |
| V                                           | 0 0.00%               | 0 0.00%                |         |
| CCI                                         | 6.67 ± 17.06          | 1.90 ± 8.07            | 0.046   |
were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Due to the retrospective nature of the study, it did not require Bioethics Committee approval.

Conflict of interests

Drs. Michał Szymański, Maciej Wilczyński, Monika Łącka, Agastya Patel, Justyna Bigda, Łukasz Kaska, Monika Proczko-Stepaniak have no interests do declare.

CRediT authorship contribution statement

Michał Szymański: Conceptualization, Formal analysis, Investigation. Maciej Wilczyński: Conceptualization, Methodology, Writing - original draft. Monika Łącka: Data curation, Writing - original draft. Agastya Patel: Writing - original draft, Writing - review & editing. Justyna Bigda: Writing - original draft. Łukasz Kaska: Writing - original draft. Monika Proczko-Stepaniak: Project administration, Supervision, Writing - review & editing.

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Michał Szymański*, Maciej Wilczyński, Monika Łącka, Agastya Patel, Justyna Bigda, Łukasz Kaska, Monika Proczko-Stepaniak

Department of General, Endocrine and Transplant Surgery, Faculty of Medicine, Medical University of Gdańsk, Poland

* Corresponding author.

E-mail address: szymanski@gumed.edu.pl (M. Szymański).