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Original article

Preoperative glucocorticoid use and risk of postoperative bleeding and infection after gastric bypass surgery for the treatment of obesity

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Abstract

Background:: Previous research suggests that patients using glucocorticoids may be at increased risk of postoperative bleeding and infection after major surgery. The objective was to investigate the association between preoperative glucocorticoid use and risk of bleeding and infection after Roux-en-Y gastric bypass surgery (RYGB). Setting: Nationwide cohort study of 13,195 patients, who underwent RYGB 2006–2012 using Danish population-based medical databases.

Methods:: Information was obtained on current (redeemed prescription <60 d before surgery), recent (prescription 60–180 d before surgery), or no glucocorticoid use, and postoperative bleeding or infection within 30 days of surgery. We computed risk differences and odds ratios (ORs) as a measure of relative risk with 95% confidence intervals (95% CIs) for the association between glucocorticoid use and bleeding or infection, adjusting for gender, age, and co-morbidities by logistic regression.

Results:: Among RYGB patients, 325 (2.5%) were current glucocorticoid users, and 365 (2.8%) were recent users. The risk of bleeding was increased in current users: 2.8% versus 1.6% among nonusers (risk difference: 1.2%, 95% CI: -.6, 3.0) corresponding to an adjusted OR of 1.5 (95% CI: .8, 3.0). For recent users, the adjusted OR for bleeding was 1.2 (95% CI: .5, 2.5). The risk of infection did not differ materially between current (1.8%), recent (1.0%) and nonusers (1.7%), corresponding to an adjusted OR of .9 (95% CI: .4, 2.1) among current versus nonusers.

Conclusions:: Current use of glucocorticoids is associated with a slightly increased risk of postoperative bleeding, but not infection, after RYGB. No increased risks were found for recent users. (Surg Obes Relat Dis 2015;■:00–00.) © 2015 American Society for Metabolic and Bariatric Surgery. All rights reserved.

Keywords: Bariatric surgery; Bleeding; Infection; Glucocorticoids; Cohort study

Synthetic glucocorticoids are potent antiinflammatory drugs widely used to attenuate the general immune response [1,2]. The antiinflammatory effect is utilized to treat several

diseases, including chronic pulmonary diseases and rheumatic diseases. For many patients discontinuation is not feasible due to likely relapse of symptoms. In Denmark, 2% of the general population between 20 and 39 years and 4% of the population between 40 and 64 years were prescribed systemic glucocorticoids at least once during 2009 [3].

Glucocorticoid use has been associated with substantial postoperative complications including delayed wound

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healing, upper gastrointestinal bleeding, and increased risk of infections [1,4–6]. These complications are important due to their adverse effect on early morbidity, length of hospital stay, and mortality [1]. A registry-based study of 635,265 American patients undergoing a variety of operations reported higher risk of postoperative infections among glucocorticoid users compared with nonusers (odds ratios 1.7–2.5) [6]. A Danish study of 19,919 women undergoing breast cancer surgery found an increased risk of reoperations due to postoperative bleeding among current glucocorticoid users (reoperation risk: 4% among patients with redeemed prescription <90 d before surgery) compared with nonusers (reoperation risk: 2.5%) and former users 90+ days before (reoperation risk: 2.6%) [7], suggesting a rather acute effect of glucocorticoid use.

For patients with morbid obesity, bariatric surgery, particularly Roux-en-Y gastric bypass (RYGB) surgery, is an effective weight loss treatment [8,9] but is also associated with postoperative complications [10–12]. Two recent registry-based observational studies and 1 randomized trial have reported absolute risks of 1.7%–2.9% for bleeding and .3%–2.9% for infection within 30 days after RYGB [10–12]. To our knowledge no previous studies have investigated the postoperative risk of bleeding or infection in patients undergoing RYGB who use glucocorticoids preoperatively. Since glucocorticoid use is frequent among young and middle-aged individuals and RYGB procedures have increased in recent years, any increased risk of postoperative bleeding or infections may have important clinical implications.

We therefore investigated the association between glucocorticoid use and the risk of postoperative bleeding and infections after RYGB, examining both current and recent use.

Methods

Setting

The Danish National Health Care System provides the entire population of Denmark (5.6 million people) with tax-supported healthcare, including RYGB surgery, and with partial reimbursement for most prescribed drugs, including glucocorticoids. All residents are assigned a unique personal identification number either at birth or upon immigration, which allows unambiguous individual-level record linkage of the healthcare registries used in this study [13,14].

Participants

This nationwide study included all patients undergoing first-time RYGB surgery (99% were laparoscopic operations) (Appendix A) in Denmark between January 1, 2006 and November 30, 2012 (N = 13,195). Patients were identified by surgical procedure codes for RYGB in the

Danish National Patient Registry (DNPR). The DNPR records information on nonpsychiatric inpatient hospitalizations and hospital outpatient clinic visits at all Danish hospitals [15]. All contacts are coded by treating physicians, using the *International Classification of Diseases*, tenth edition (ICD-10), since 1995. The registry compiles data on admission and discharge dates, diagnoses, surgical procedures, and municipality of residence [15]. It allows for 1 primary diagnosis code (condition that prompted patient admission and treatment course) and up to 20 secondary codes. We excluded patients with fewer than 30 days of follow-up (n = 24) and foreign residents (n = 37).

Use of glucocorticoids

Data on use of glucocorticoids were obtained from the Danish National Health Service Prescription Database (DNHSPD), a national database established by the Danish Regions together with the Department of Clinical Epidemiology, Aarhus University Hospital [16]. It contains information on prescription redemption dates and type of medication dispensed according to the Anatomical Therapeutic Chemical (ATC) Classification System (Appendix B) [16]. Drug exposures examined in our study were oral and intestinal-acting glucocorticoids. Redeemed prescriptions for these drugs were identified for all patients 180 days before RYGB. Patients were classified as nonusers if they had no redeemed prescription 180 days before the surgery date, as current glucocorticoid users if they had one or more redeemed prescriptions <60 days before the surgery date, and as recent glucocorticoid users if they had redeemed prescription for glucocorticoids 60–180 days before the surgery date.

Postoperative bleeding and infection

Patients were followed for 30 days after surgery. Data on primary or secondary diagnosis codes for postoperative gastrointestinal bleeding and infections were obtained from the DNPR during and after the index admission (Appendix C). The patients were categorized as having “postoperative bleeding”/“no postoperative bleeding” and/or as having “postoperative infection”/“no postoperative infection.”

Mortality

The Danish Civil Registration System (CRS) contains information on gender, age, civil personal registration number, date of birth, and date of death (if any) for each person. The register is complete from 1968 on [14].

Covariates

We used the DNPR to summarize each patient’s medical history during the 2 years before RYGB, focusing on diagnoses included in the Charlson Comorbidity Index

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