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Bariatric Surgery and Obstetric Care

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1. Clinical Practice Guidelines for Childbearing Female Candidates for Bariatric Surgery, Pregnancy, and Post-partum Management After Bariatric Surgery.

Author(s): Ciangura, Cécile; Coupaye, Muriel; Deruelle, Philippe; Gascoin, Géraldine; Calabrese, Daniela; Cosson, Emmanuel; Ducarme, Guillaume; Gaborit, Bénédicte; Lelièvre, Bénédicte; Mandelbrot, Laurent; Petrucciani, Niccolo; Quilliot, Didier; Ritz, Patrick; Robin, Geoffroy; Sallé, Agnès; Gugenheim, Jean; Nizard, Jacky; BARIA-MAT Group

Source: Obesity surgery; Nov 2019; vol. 29 (no. 11); p. 3722-3734

Publication Date: Nov 2019

Publication Type(s): Journal Article Review

PubMedID: 31493139

Available at Obesity surgery - from SpringerLink - Medicine

Abstract: Emerging evidence suggests that bariatric surgery improves pregnancy outcomes of women with obesity by reducing the rates of gestational diabetes, pregnancy-induced hypertension, and macrosomia. However, it is associated with an increased risk of a small-for-gestational-age fetus and prematurity. Based on the work of a multidisciplinary task force, we propose clinical practice recommendations for pregnancy management following bariatric surgery. They are derived from a comprehensive review of the literature, existing guidelines, and expert opinion covering the preferred type of surgery for women of childbearing age, timing between surgery and pregnancy, contraception, systematic nutritional support and management of nutritional deficiencies, screening and management of gestational diabetes, weight gain during pregnancy, gastric banding management, surgical emergencies, obstetrical management, and specific care in the postpartum period and for newborns.

Database: Medline

2. Impact of Bariatric Surgery on Female Reproductive Health and Maternal Outcomes

Author(s): Christinajoice S.; Misra S.; Bhattacharya S.; Kumar S.S.; Nandhini B.D.; Palanivelu C.; Raj P.P.

Source: Obesity Surgery; 2019

Publication Date: 2019

Publication Type(s): Article

PubMedID: 31721063

Available at Obesity Surgery - from SpringerLink - Medicine

Abstract: Introduction: Obesity has a derogatory effect on female reproductive health. Obesity contributes to difficulty in natural conception, increased risk of pregnancy-associated complications, miscarriages, congenital anomalies, and also the long-term negative impact on both mother and the child. Objective(s): Our study aimed to analyze and assess the reproductive health-associated outcomes of females who underwent bariatric surgery. Method(s): We performed a retrospective analysis from a prospectively collected database from June 2013 to June2016. Out of 71 females studied, 45 patients (63.5%) had completed 3 years of follow-up. The data were collected from inpatient and outpatient records. Patients were studied under three groups (A, patients with polycystic ovarian disease (PCOD) symptoms; B, patients with primary infertility; and C, patients who conceived after bariatric surgery that were included in groups A and B). Result(s): Out of 45 patients studied, 40 patients underwent laparoscopic sleeve gastrectomy (LSG), four patients underwent laparoscopic Roux-en-Y gastric bypass (RYGB), and one patient underwent laparoscopic adjustable gastric banding (LAGB). The mean BMI of the patients was 43.64 +/- 6.8 kg/m2. PCOD symptoms improved symptomatically (p = 0.001) after surgery in the group. Seven (43.75%) primary infertility patients conceived after surgery. Three (42.9%) patients conceived naturally while 4 (57.1%) conceived with ART in group B. Out of total population of 45 in group C, percentages of patients who delivered baby with short gestational age (SGA), low birth weight (LBW), normal vaginal deliveries (NVD), and maternal anemia were 63.15%,47.3%,73.4%, and26.3%, respectively. Conclusion(s): Obesity is closely associated with primary infertility and PCOD. Menstrual abnormalities associated with PCOD significantly improve after bariatric surgery with significant improvement in fertility along with maternal outcomes.

Database: EMBASE

3. Perinatal outcomes following bariatric surgery between a first and second pregnancy: a population data linkage study.

Author(s): Ibiebele, I; Gallimore, F; Schnitzler, M; Torvaldsen, S; Ford, J B

Source: BJOG : an international journal of obstetrics and gynaecology; Nov 2019

Publication Date: Nov 2019

Publication Type(s): Journal Article

PubMedID: 31749274

Abstract:OBJECTIVESTo describe the population of women having bariatric surgery and compare the pregnancy outcomes for women having bariatric surgery with a non-bariatric surgery population having a first and second pregnancy.DESIGNPopulation-based record linkage study.SETTINGNew South Wales (NSW), Australia.POPULATIONAll women aged 15-45 years with a hospital record in NSW (2002-2014) and all women giving birth in NSW (1994-2015; n = 1 606 737 women).METHODSPregnancy and birth outcomes were compared between first and second pregnancies using repeated-measures logistic regression and paired Student's t-tests. Bariatric and non-bariatric groups were also compared.MAIN OUTCOME MEASURESMaternal diabetes, preterm birth (<37 weeks of gestation) and large for gestational age.RESULTSThere was a 13-fold increase in hospitalisations for primary bariatric surgery during 2002-2014. Compared with the general birthing population, women who had bariatric surgery experienced higher rates of hypertension, diabetes, and preterm birth. Among women who had bariatric surgery between a first and second pregnancy, there were reduced rates of hypertension (OR 0.39, 95% CI 0.29-0.53), spontaneous preterm birth (OR 0.37, 95% CI 0.16-0.86), infants that were large for gestational age (OR 0.63, 95% CI 0.44-0.88), and the admission of infants to a special care nursery or neonatal intensive care (OR 0.64, 95% CI 0.46-0.90) in the second pregnancy. Rates for small-for-gestational age and gestational diabetes following surgery were 8.3 and 11.4%, respectively CONCLUSIONS: Bariatric surgery between a first and second pregnancy was associated with reductions in obesity-related adverse pregnancy outcomes. Bariatric surgery performed for the management of obesity in accordance with current clinical criteria is associated with improved pregnancy outcomes in a subsequent pregnancy.TWEETABLE ABSTRACTBariatric surgery for obesity may improve pregnancy and birth outcomes in a subsequent pregnancy.

Database: Medline

4. Effects of Bariatric Surgery on Maternal and Infant Outcomes of Pregnancy-An Evidence Analysis Center Systematic Review.

Author(s): Al-Nimr, Rima Itani; Hakeem, Rubina; Moreschi, Julie M; Gallo, Sina; McDermid, Joann M; Pari-Keener, Maria; Stahnke, Barbara; Papoutsakis, Constantina; Handu, Deepa; Cheng, Feon W

Source: Journal of the Academy of Nutrition and Dietetics; Nov 2019; vol. 119 (no. 11); p. 1921-1943

Publication Date: Nov 2019

Publication Type(s): Journal Article

PubMedID: 31040070

Abstract:BACKGROUNDWhile obesity presents specific acute and long-term risks to the pregnant woman and her offspring, the effects of bariatric surgery on pregnancy outcomes are undetermined.OBJECTIVEA systematic review was performed according to the Academy of Nutrition and Dietetics Evidence Analysis Library process to determine the effects of bariatric surgery on both maternal and infant health outcomes of pregnancy.DESIGNA comprehensive literature search of PubMed was conducted to identify studies published from years 2000 to 2015 that examined the health effects of pregnancy after bariatric surgery. Experimental studies and observational studies with a control group were included.MAIN OUTCOME MEASURESOutcomes of interest were gestational weight gain, maternal complications (ie, gestational diabetes, pre-eclampsia, eclampsia, hypertension, and postpartum hemorrhage), miscarriage and/or stillbirth, cesarean section, birth weight in grams, birth weight in categories (ie, macrosomia, low birth weight, small for gestational age, and large for gestational age), gestational age and preterm birth, infant illness and complications (ie, perinatal death, admission to neonatal intensive care unit, neonatal illness, and congenital malformation rates), and Apgar scores.RESULTSThirteen of 246 studies were included. Compared to body mass index-matched controls without surgery, bariatric surgery before pregnancy reduced infant birth weight in grams, with no effect on total maternal gestational weight gain or Apgar scores. Surgery did not increase risk of adverse outcomes, such as miscarriage and/or stillbirth, preterm birth, or infant complications. Effects of surgery on maternal complications, infant birth weight categories, and surgical delivery rates were inconsistent.CONCLUSIONSBariatric surgery is a successful treatment of maternal obesity, but certain surgery-specific risks may exist. More data are needed to determine clinical guidelines. The long-term effects of surgery on pregnancy outcomes are unknown.

Database: Medline

5. Nutritional and perinatal outcomes of pregnant women with a history of bariatric surgery: a case series from a UK centre.

Author(s): Maslin, K; Douek, I; Greenslade, B; Shawe, J

Source: Journal of human nutrition and dietetics : the official journal of the British Dietetic Association; Nov 2019

Publication Date: Nov 2019

Publication Type(s): Journal Article

PubMedID: 31765078

Abstract:BACKGROUNDWomen with obesity who become pregnant after bariatric surgery have a reduced risk of several obstetric complications; however, limited data exist from the UK population. The present study aimed to characterise a case series of women who attended a medical antenatal clinic for pregnancy following bariatric surgery.METHODSRoutine clinical information was collected retrospectively from the medical notes of women who had bariatric surgery and subsequently delivered between January 2012 and November 2018. All were seen in the medical antenatal clinic at Musgrove Park Hospital, Taunton.RESULTSData were available for 46 pregnancies. Of these, 27.9% conceived in the first year after surgery. At 9 weeks of gestation, 13.3%, 28.9%, 33.3% and 24.4% were in the healthy, overweight, obese or severely obese category, respectively. Mean (SD) gestational weight gain was 11.9 (6.9) kg, with 54.1% gaining excess weight. Less than half (39.1%) of women were taking the recommended dose of 5 mg of folic acid when first seen. Some 56.1% and 64.6% had suboptimal iron or vitamin D statuses, respectively. Following advice from the clinic, a greater proportion of women took suitable micronutrient supplements. Subsequently, 93% of babies were born at full term, of whom 88% were of healthy weight.CONCLUSIONSDespite the nutritional risks associated with bariatric surgery and the high prevalence of obesity during pregnancy, perinatal outcomes were generally positive, with low rates of infants born preterm or low birth weight. Nutritional supplementation practices and iron status improved with input from a specialist team, underlying the importance of individualised input in this population.

Database: Medline

6. Does pregnancy interval after laparoscopic sleeve gastrectomy affect maternal and perinatal outcomes?

Author(s): Basbug A.; Ellibes Kaya A.; Dogan S.; Pehlivan M.; Goynumer G.

Source: Journal of Maternal-Fetal and Neonatal Medicine; Nov 2019; vol. 32 (no. 22); p. 3764-3770

Publication Date: Nov 2019

Publication Type(s): Article

PubMedID: 29712482

Abstract: Background: Obesity is a global health epidemic and is associated with many maternal and neonatal complications. Laparoscopic sleeve gastrectomy (LSG) is among the surgical treatments for obesity. The appropriate timing of pregnancy following LSG remains controversial and few studies have evaluated this public health issue. Objective(s): To evaluate the effect of pregnancy timing after LSG on maternal and perinatal outcomes. Study design: We performed a retrospective observational study of 23 pregnant women who underwent LSG at a tertiary hospital in Turkey. Women who became pregnant within 18 months of undergoing LSG were included in the early pregnancy after LSG group, and those who became pregnant after 18 months were included the late pregnancy after LSG group. Maternal and perinatal outcomes were evaluated, including gestational diabetes mellitus (GDM), pregnancy-associated hypertensive disorders, preterm birth, mode of delivery, small and large for gestational age births (small for gestational age (SGA), large for gestational age (LGA)), birth injury, and congenital malformations. Result(s): Body mass index (BMI) at conception was higher in the early pregnancy after LSG group than in the late pregnancy after LSG group (30.48 versus 27.25, respectively; p =.03). Pregnancy interval after LSG did not impact maternal-fetal complications or mode of delivery. After a 75 g oral glucose tolerance test (OGTT) for GDM, 75% (n = 6) of the early pregnancy group presented with early dumping syndrome, compared to only 13.3% (n = 2) of the late pregnancy after LSG group (p =.009). Conclusion(s): LSG may reduce obesity-related gestational complications, such as GDM and LGA. The interval between LSG and conception did not impact maternal or neonatal outcomes. Screening for GDM can result in dumping syndrome in pregnancies after LSG.

Database: EMBASE

7. Pregnancy After Bariatric Surgery: a Comparative Study of Post-Bariatric Pregnant Women Versus Non-Bariatric Obese Pregnant Women.

Author(s): Balestrin, Bruna; Urbanetz, Almir Antônio; Barbieri, Manoela Muller; Paes, Aliane; Fujie, Jessica

Source: Obesity surgery; Oct 2019; vol. 29 (no. 10); p. 3142-3148

Publication Date: Oct 2019

Publication Type(s): Journal Article

PubMedID: 31129885

Available at Obesity surgery - from SpringerLink - Medicine

Abstract:PURPOSETo evaluate the impact of bariatric surgery on the gestational outcomes.MATERIALS AND METHODSRetrospective study of pregnant women hospitalized for delivery in the maternity in Curitiba, Brazil, who had a body mass index (BMI) greater than or equal to 30 kg/m2 and/or who had undergone bariatric surgery. Interviews were performed, and the patients' medical records and antenatal information cards were evaluated.RESULTSNinety-three pregnant women who had bariatric surgery and 205 obese pregnant women were selected. A lower occurrence of hypertensive diseases was observed in pregnant women who had undergone bariatric surgery (14%) compared with obese pregnant women (56.6%). Moreover, a reduced occurrence of diabetes was found in post-bariatric pregnant women (16.1%) compared with obese pregnant women (30.2%). There were no differences in the frequency of prematurity, in delivery methods, or in postpartum complications. There was a higher number of cases of babies who were small for gestational age and a lower number of babies who were large for gestational age in the post-bariatric group. When comparing obese pregnant women to post-bariatric pregnant women who had remained obese, a reduced frequency of hypertensive diseases and diabetes was found in the latter group, but the weight difference between their newborns was not statistically significant.CONCLUSIONThere was a lower occurrence of health-related issues complicating pregnancy among women who had undergone bariatric surgery, but these women's newborns were more likely to be small for gestational age, a finding which was less significant the less weight the mother had lost.

Database: Medline

8. What Is Known About the Nutritional Intake of Women during Pregnancy Following Bariatric Surgery? A Scoping Review.

Author(s): Maslin, Kate; James, Alison; Brown, Anne; Bogaerts, Annick; Shawe, Jill

Source: Nutrients; Sep 2019; vol. 11 (no. 9)

Publication Date: Sep 2019

Publication Type(s): Journal Article Review

PubMedID: 31492000

Abstract: Optimising the diet and weight of women prior to and during pregnancy is of paramount importance to both maternal and offspring health. In women who become pregnant after bariatric surgery, evidence suggests a better overall obstetric outcome in comparison to women with severe obesity managed conservatively. Historically, most studies in this population group have monitored supplement adherence or serum concentrations of micronutrients, rather than dietary intake. The aim of this study was to synthesise current knowledge of the dietary intake of women during pregnancy following bariatric surgery. A systematic search of search engines was conducted using the following databases: MEDLINE, Embase, CINAHL, Cochrane database, Scopus, Trip, NHS Evidence, UK Clinical Trials, ClinicalTrials.gov, Prospero, Epistemonikos and Open Grey. Titles and abstracts were screened independently by two reviewers against predefined inclusion and exclusion criteria. After removal of duplicates, 1594 titles were identified, of which 1586 were initially excluded. Following full-text review, four articles were included. In total, across all four studies, data from only 202 bariatric surgery participants were included, the majority of whom had had one type of surgery. Just one study included a control group. Reporting of nutritional outcomes was heterogenous, with none of the studies including complete macro and micronutrient intake results in their articles. An insufficient intake of protein was noted as a concern in two studies and associated with poor fetal growth in one study. Overall, this review has identified a paucity of data about the dietary intake of women during pregnancy after bariatric surgery.

Database: Medline

9. Pregnancy after bariatric surgery and adverse perinatal outcomes: A systematic review and meta-analysis.

Author(s): Akhter, Zainab; Rankin, Judith; Ceulemans, Dries; Ngongalah, Lem; Ackroyd, Roger; Devlieger, Roland; Vieira, Rute; Heslehurst, Nicola

Source: PLoS medicine; Aug 2019; vol. 16 (no. 8); p. e1002866

Publication Date: Aug 2019

Publication Type(s): Journal Article

PubMedID: 31386658

Abstract:BACKGROUNDWomen who undergo bariatric surgery prior to pregnancy are less likely to experience comorbidities associated with obesity such as gestational diabetes and hypertension. However, bariatric surgery, particularly malabsorptive procedures, can make patients susceptible to deficiencies in nutrients that are essential for healthy fetal development. The objective of this systematic review and meta-analysis is to investigate the association between pregnancy after bariatric surgery and adverse perinatal outcomes.METHODS AND FINDINGSSearches were conducted in Medline, Embase, PsycINFO, CINAHL, Scopus, and Google Scholar from inception to June 2019, supplemented by hand-searching reference lists, citations, and journals. Observational studies comparing perinatal outcomes post-bariatric surgery to pregnancies without prior bariatric surgery were included. Outcomes of interest were perinatal mortality, congenital anomalies, preterm birth, postterm birth, small and large for gestational age (SGA/LGA), and neonatal intensive care unit (NICU) admission. Pooled effect sizes were calculated using random-effects meta-analysis. Where data were available, results were subgrouped by type of bariatric surgery. We included 33 studies with 14,880 pregnancies post-bariatric surgery and 3,979,978 controls. Odds ratios (ORs) were increased after bariatric surgery (all types combined) for perinatal mortality (1.38, 95% confidence interval [CI] 1.03-1.85, p = 0.031), congenital anomalies (1.29, 95% CI 1.04-1.59, p = 0.019), preterm birth (1.57, 95% CI 1.38-1.79, p < 0.001), and NICU admission (1.41, 95% CI 1.25-1.59, p < 0.001). Postterm birth decreased after bariatric surgery (OR 0.46, 95% CI 0.35-0.60, p < 0.001). ORs for SGA increased (2.72, 95% CI 2.32-3.20, p < 0.001) and LGA decreased (0.24, 95% CI 0.14-0.41, p < 0.001) after gastric bypass but not after gastric banding. Babies born after bariatric surgery (all types combined) weighed over 200 g less than those born to mothers without prior bariatric surgery (weighted mean difference -242.42 g, 95% CI -307.43 to -177.40 g, p < 0.001). There was low heterogeneity for all outcomes (I2 < 40%) except LGA. Limitations of our study are that as a meta-analysis of existing studies, the results are limited by the quality of the included studies and available data, unmeasured confounders, and the small number of studies for some outcomes.CONCLUSIONSIn our systematic review of observational studies, we found that bariatric surgery, especially gastric bypass, prior to pregnancy was associated with increased risk of some adverse perinatal outcomes. This suggests that women who have undergone bariatric surgery may benefit from specific preconception and pregnancy nutritional support and increased monitoring of fetal growth and development. Future studies should explore whether restrictive surgery results in better perinatal outcomes, compared to malabsorptive surgery, without compromising maternal outcomes. If so, these may be the preferred surgery for women of reproductive age.TRIAL REGISTRATIONPROSPERO CRD42017051537.

Database: Medline

10. Plasma concentrations of etonogestrel in women using oral desogestrel before and after Roux-en-Y gastric bypass surgery: a pharmacokinetic study.

Author(s): Ginstman, C; Frisk, J; Carlsson, B; Ärlemalm, A; Hägg, S; Brynhildsen, J

Source: BJOG : an international journal of obstetrics and gynaecology; Mar 2019; vol. 126 (no. 4); p. 486-492

Publication Date: Mar 2019

Publication Type(s): Clinical Trial, Phase Ii Journal Article

PubMedID: 30347490

Available at BJOG : an international journal of obstetrics and gynaecology - from Wiley Online Library

Abstract:OBJECTIVETo investigate whether Roux-en-Y gastric bypass (RYGB) affects oral desogestrel (etonogestrel) pharmacokinetics.DESIGNSingle centre, open label, phase-2 pharmacokinetic study.SETTINGUniversity hospital of Linköping, Sweden.POPULATIONFourteen women with planned RYGB surgery were included; nine women aged 18-45 years using 75 micrograms desogestrel completed the study.METHODSSteady-state etonogestrel pharmacokinetic (PK) parameters were measured on three occasions for each individual (at 8 ± 6 weeks before surgery, and at 12 ± 2 and 52 ± 2 weeks after surgery). Each patient served as her own control. On each occasion, serum samples were collected during a 24-hour period and etonogestrel concentrations were determined with ultra-performance liquid chromatography/tandem mass spectrometry.MAIN OUTCOME MEASURESArea under the plasma concentration time curve of etonogestrel (AUC0-24 hours).RESULTSAll women had significant postoperative weight loss. There were no significant differences in AUC0-24 hours , terminal half-lives (t½), time to peak serum concentrations (Tmax), or apparent oral clearances of etonogestrel (CLoral) before and after gastric bypass surgery on any occasion. Peak serum concentrations (Cmax) increased after 52 ± 2 weeks compared with preoperative values (0.817 ng/ml versus 0.590 ng/ml, P = 0.024).CONCLUSIONTo our knowledge, this is the first study to investigate the effects on desogestrel pharmacokinetics after RYGB. This study did not reveal any clinically significant changes in etonogestrel pharmacokinetics, suggesting that oral desogestrel may be used by women after RYGB surgery. The sample size was limited, however, and therefore the results should be interpreted cautiously.TWEETABLE ABSTRACTThe pharmacokinetics of oral desogestrel does not appear to change after gastric bypass surgery.

Database: Medline

11. Maternal nutritional status and related pregnancy outcomes following bariatric surgery: A systematic review

Author(s): Rottenstreich A.; Elchalal U.; Elazary R.; Pikarsky A.J.; Goldenshluger A.; Ben-Porat T.

Source: Surgery for Obesity and Related Diseases; Feb 2019; vol. 15 (no. 2); p. 324-332

Publication Date: Feb 2019

Publication Type(s): Review

PubMedID: 30658948

Abstract: Up to 80% of patients who undergo bariatric surgery are women of childbearing age. Coupled with improved fertility in women with obesity after bariatric surgery, pregnancy postbariatric surgery has become increasingly more common. Although numerous studies have evaluated associations of bariatric surgery with pregnancy outcomes, the effect of maternal nutritional status on maternal and perinatal outcomes is not well established. We used Medline and Embase databases and a manual search of references for articles published until June 2018 to conduct a systematic review on nutritional status after bariatric surgery and its association with maternal and perinatal outcomes. Of the 306 initially identified articles, 27 met the study inclusion criteria, comprising 2056 women with pregnancies after bariatric surgery. Deficiencies were reported in maternal concentrations of vitamins A, B1, B6, B12, C, D, K, iron, calcium, selenium, and phosphorous. The only adverse events documented for these deficiencies encountered during pregnancy were anemia (vitamin B12, iron), night blindness (vitamin A), and urinary tract infections (vitamin A, D). This systematic review suggests that various micronutrient deficiencies are common among pregnant postbariatric surgery patients. Nevertheless, despite the concern that these deficiencies could adversely affect pregnancy outcomes (e.g., lower neonatal birth weight), evidence of such is lacking. Further prospective studies are warranted to confirm our findings and better delineate the optimal supplementation regimen during pregnancy after bariatric surgery.

Database: EMBASE

12. Pregnancy after bariatric surgery: a narrative literature review and discussion of impact on pregnancy management and outcome.

Author(s): Falcone, Veronica; Stopp, Tina; Feichtinger, Michael; Kiss, Herbert; Eppel, Wolfgang; Husslein, Peter Wolf; Prager, Gerhard; Göbl, Christian S

Source: BMC pregnancy and childbirth; Dec 2018; vol. 18 (no. 1); p. 507

Publication Date: Dec 2018

Publication Type(s): Journal Article Review

PubMedID: 30587161

Abstract: Bariatric surgery (BS) is regarded to be the most effective treatment of obesity with long lasting beneficial effects including weight loss and improvement of metabolic disorders. A considerable number of women undergoing BS are at childbearing age.Although the surgery mediated weight loss has a positive effect on pregnancy outcome, the procedures might be associated with adverse outcomes as well, for example micronutrient deficiencies, iron or B12 deficiency anemia, dumping syndrome, surgical complications such as internal hernias, and small for gestational age (SGA) offspring, possibly due to maternal undernutrition. Also, there is no international consensus concerning the ideal time to conception after BS. Hence, the present narrative review intents to summarize the available literature concerning the most common challenges which arise before and during pregnancy after BS, such as fertility related considerations, vitamin and nutritional deficiencies and their adequate compensation through supplementation, altered glucose metabolism and its implications for gestational diabetes screening, the symptoms and treatment of dumping syndrome, surgical complications and the impact of BS on pregnancy outcome. The impact of different bariatric procedures on pregnancy and fetal outcome will also be discussed, as well as general considerations concerning the monitoring and management of pregnancies after BS.Whereas BS leads to the mitigation of many obesity-related pregnancy complications, such as gestational diabetes mellitus (GDM), pregnancy induced hypertension and fetal macrosomia; those procedures pose new risks which might lead to adverse outcomes for mothers and offspring, for example nutritional deficiencies, anemia, altered maternal glucose metabolism and small for gestational age children.

Database: Medline

13. The effect of surgery-to-conception interval on pregnancy outcomes after sleeve gastrectomy.

Author(s): Rottenstreich, Amihai; Levin, Gabriel; Kleinstern, Geffen; Rottenstreich, Misgav; Elchalal, Uriel; Elazary, Ram

Source: Surgery for obesity and related diseases : official journal of the American Society for Bariatric Surgery; Dec 2018; vol. 14 (no. 12); p. 1795-1803

Publication Date: Dec 2018

Publication Type(s): Journal Article

PubMedID: 30385070

Abstract:BACKGROUNDThe optimal timing of pregnancy after bariatric surgery has not been established, with data limited regarding laparoscopic sleeve gastrectomy (LSG), currently the most common bariatric operation performed.OBJECTIVESWe explored associations of the surgery-to-conception interval with pregnancy outcomes after LSG.SETTINGA university hospital.METHODSWe assessed pregnancy outcomes in relation to the surgery-to-conception interval for all women who underwent LSG and delivered during 2006 to 2018.RESULTSOf 154 patients, 67 (43.5%) conceived within the first 18 months postoperatively (early-pregnancy group), whereas 87 (56.5%) conceived later (late-pregnancy group). The median surgery-to-conception interval was 390 (interquartile range 247-459) days in the early-pregnancy group and 1104 (8527-1548) days in the late-pregnancy group. Compared with the early-pregnancy group, the late-pregnancy group had higher gestational weight gain (median 11 versus 8 kg, P < .001) and lower hemoglobin levels in early pregnancy (12.3 versus 12.6 g/dL, P = .03) and after delivery (10.0 versus 10.4 g/dL, P = .02). Other maternal and perinatal outcomes were similar between the groups, including the proportion of small-for-gestational-age infants (11.9% versus 14.9%, P = .64) for those who conceived within or later than 18 months after surgery. Similar rates of small-for-gestational-age infants were found between those who conceived within or ≥12 months after surgery (P = 1.0).CONCLUSIONSTiming of pregnancy after LSG was found not to be associated with pregnancy outcomes. Together with documentations of a similar safety profile of pregnancy occurring earlier or later in the postoperative course, these data should reassure women who do not wish to delay conception after surgery.

Database: Medline

14. Fertility, Pregnancy and Lactation After Bariatric Surgery - a Consensus Statement from the OEGGG.

Author(s): Stopp, Tina; Falcone, Veronica; Feichtinger, Michael; Göbl, Christian

Source: Geburtshilfe und Frauenheilkunde; Dec 2018; vol. 78 (no. 12); p. 1207-1211

Publication Date: Dec 2018

Publication Type(s): Journal Article

PubMedID: 30655646

Available at Geburtshilfe und Frauenheilkunde - from Unpaywall

Abstract: Bariatric surgery is recommended when other weight loss interventions, such as lifestyle modification or medications, have failed. A considerable number of women undergoing bariatric surgery are of childbearing age; hence, it is necessary to be aware of the effects of bariatric surgery on pregnancy for managing these patients. Although bariatric surgery is associated with positive effects on cardiovascular and metabolic parameters, side effects such as anaemia, the risk of developing internal hernia, altered glucose metabolism and the risk of small for gestational age offspring have to be considered. Pregnant women with a history of gastric bypass should not undergo the oral glucose tolerance test (OGTT) due to the high risk of hypoglycaemia. There are no

contraindications for vaginal delivery and breastfeeding. This paper has been published as a consensus statement by the Austrian Society of Gynaecology and Obstetrics (OEGGG).

Database: Medline

15. Influence of Time Interval from Bariatric Surgery to Conception on Pregnancy and Perinatal Outcomes.

Author(s): Rasteiro, Cátia; Araújo, Célia; Cunha, Sara; Caldas, Rita; Mesquita, Joana; Seixas, Adérito; Augusto, Nuno; Ramalho, Carla

Source: Obesity surgery; Nov 2018; vol. 28 (no. 11); p. 3559-3566

Publication Date: Nov 2018

Publication Type(s): Journal Article

PubMedID: 30027331

Available at Obesity surgery - from SpringerLink - Medicine

Available at Obesity surgery - from ProQuest (Health Research Premium) - NHS Version

Abstract:INTRODUCTIONPregnancy in women submitted to bariatric surgery is increasing. Recommendations for surveillance of these pregnancies have been suggested, but an adequate time interval from surgery to conception, to avoid perinatal negative outcomes, is still controversial.MATERIAL AND METHODSMedical records of pregnancies in women with previous bariatric surgery were retrieved and outcomes were assessed according to three different time thresholds (12, 18 and 24 months). The association between time from surgery to conception and the presence of adverse outcomes was analysed.RESULTSEighty-six pregnancies were assessed. Weight gain was higher (p = 0.014) and more adequate (p = 0.041) when pregnancy occurred more than 12 months after surgery. Foetal growth percentile was lower when pregnancy was achieved before 24 months following surgery (p = 0.021). No differences among groups were found in other assessed outcomes (BMI, gestational age at delivery, type of delivery, gestational diabetes, pregnancy hypertensive disease, anaemia, preterm delivery, foetal weight, foetal growth restriction, Apgar score, admission to neonatal intensive unit) in all considered thresholds. No association between time from surgery to conception and the presence of adverse outcomes was found.CONCLUSIONDespite differences found in maternal weight gain and foetal growth percentile, our study does not support the recommendation to delay pregnancy based on a fixed deadline. Other factors, including a more individualised approach, need to be considered.

Database: Medline

16. Intrauterine Fetal Growth Delay During Late Pregnancy After Maternal Gastric Bypass Surgery.

Author(s): Feichtinger, Michael; Falcone, Veronica; Schoenleitner, Theresa; Stopp, Tina; Husslein, Peter Wolf; Eppel, Wolfgang; Chalubinski, Kinga M; Göbl, Christian S

Source: Ultraschall in der Medizin (Stuttgart, Germany : 1980); Oct 2018

Publication Date: Oct 2018

Publication Type(s): Journal Article

PubMedID: 30360008

Abstract:PURPOSE To investigate intrauterine fetal growth development and birth anthropometry of fetuses conceived after maternal gastric bypass surgery.MATERIALS AND METHODS Longitudinal cohort study describing longitudinal growth estimated by ultrasound on 43 singleton pregnancies after gastric bypass compared to 43 BMI-matched controls.RESULTS In fetuses after maternal gastric bypass surgery, growth percentiles decreased markedly from the beginning of the second trimester until the end of the third trimester (decrease of 3.1 fetal abdomen circumference percentiles (95 %CI 0.9 - 5.3, p = 0.007) per four gestational weeks). While in the second trimester, fetal anthropometric measures did not differ between the groups, the mean abdomen circumference percentiles appeared significantly smaller during the third trimester in offspring of mothers after gastric bypass (mean difference 25.1 percentiles, p < 0.001). Similar tendencies have been observed in estimated fetal weight resulting in significantly more SGA offspring at delivery in the gastric bypass group. In children born after maternal gastric bypass surgery, weight percentiles (32.12th vs. 55.86th percentile, p < 0.001) as well as placental weight (525.2 g vs. 635.7 g, p < 0.001) were significantly reduced compared to controls.CONCLUSION In fetuses conceived after maternal gastric bypass, intrauterine fetal growth distinctively declined in the second and third trimester, most prominently observed in fetal abdomen circumferences. Birth weight and placental weight at birth was significantly lower compared to BMI-matched controls, possibly due to altered maternal metabolic factors and comparable to mothers experiencing chronic hunger episodes.

Database: Medline

17. Impact of Roux-en-Y gastric bypass and sleeve gastrectomy on fetal growth and relationship with maternal nutritional status.

Author(s): Coupaye, Muriel; Legardeur, Hélène; Sami, Ouidad; Calabrese, Daniela; Mandelbrot, Laurent; Ledoux, Séverine

Source: Surgery for obesity and related diseases : official journal of the American Society for Bariatric Surgery; Oct 2018; vol. 14 (no. 10); p. 1488-1494

Publication Date: Oct 2018

Publication Type(s): Comparative Study Journal Article Observational Study

PubMedID: 30146424

Abstract:BACKGROUNDThere is a lack of evidence on whether sleeve gastrectomy (SG), which induces fewer nutritional deficiencies than Roux-en-Y gastric bypass (RYGB), also affects fetal growth (FG).OBJECTIVESTo compare neonatal outcomes after RYGB and SG and to assess the impact of maternal nutritional alterations on FG after both procedures.SETTINGUniversity Hospital, France.METHODSWomen with singleton pregnancies who had at least 1 nutritional evaluation in our institution between 2004 and 2017 were included. FG was assessed with birth weight (BW) and BW-Z score (adjusted for sex and term), and maternal nutritional deficiencies were defined according to standard and pregnancy-specific norms.RESULTSDuring the study period 123 pregnancies were included, 77 after RYGB and 46 after SG. Weight loss was higher after RYGB than after SG (45.6 ± 12.4 versus 39.5 ± 13.7 kg, P = .02), but mean weight before pregnancy and weight gain during

pregnancy were similar. Mean BW (3026 ± 677 versus 3162 ± 712 g), mean BW Z-score and incidence of small for gestational age (24% versus 19%) were not significantly different after RYGB and SG. Mean number of nutritional deficiencies during the second trimester was similar (2.2 ± 1.5 versus 2.1 ± 1.2 with specific norms), but the affected parameters differed between procedures. Urinary urea (R = .285, P = .04) was positively correlated to BW Z-score after both procedures. In contrast, serum iron parameters were negatively associated to BW Z-score.CONCLUSIONFG restriction occurs after both SG and RYGB. FG after bariatric surgery is positively associated with protein supply and negatively correlated with maternal iron status.

Database: Medline

18. Maternal Anthropometry and Its Relationship with the Nutritional Status of Vitamin D, Calcium, and Parathyroid Hormone in Pregnant Women After Roux-en-Y Gastric Bypass.

Author(s): Cruz, Sabrina; de Matos, Andrea Cardoso; da Cruz, Suelem Pereira; Pereira, Silvia; Saboya, Carlos; Ramalho, Andréa

Source: Obesity surgery; Oct 2018; vol. 28 (no. 10); p. 3116-3124

Publication Date: Oct 2018

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

PubMedID: 29943103

Available at Obesity surgery - from SpringerLink - Medicine

Available at Obesity surgery - from ProQuest (Health Research Premium) - NHS Version

Abstract:OBJECTIVETo assess the influence of pre-pregnancy body mass index (BMI), total gestational weight gain (TGWG), and pre-pregnancy surgical success on the nutritional status of vitamin D, calcium, and parathyroid hormone (PTH) in the trimesters of pregnancy of women who previously underwent Roux-en-Y gastric bypass (RYGB).METHODOLOGYThis is an analytical, longitudinal, and retrospective study comprising 42 pregnant women who previously underwent RYGB. Concentrations of vitamin D3, calcium, and PTH were assessed in all trimesters. Anthropometric variables necessary for calculating TGWG, surgical success, and BMI were collected preoperatively and over the trimesters of pregnancy.RESULTSA total of 97.1% had vitamin D3 inadequacy at some point in pregnancy. Pre-pregnancy BMI, even when classified as overweight, may have exacerbated the serum concentrations of this vitamin in the third trimester (p = 0.011), and it was significantly lower in women with normal weight and/or obesity (p = 0.039). It was evidenced that both pre-pregnancy BMI and TGWG above the recommended optimal weight can be associated with calcium homeostasis, especially early in pregnancy. It was also shown that surgical success in the pre-pregnancy period may have influenced the serum concentrations of vitamin D in the second trimester of pregnancy (p = 0.013).CONCLUSIONThis study draws attention to the importance of monitoring the nutritional status of vitamin D3 and calcium in the prenatal period due to its relationship with pre-pregnancy BMI, TGWG, and surgical success.

Database: Medline

19. Influence of Biliopancreatic Diversion on Pregnancy Outcomes in Comparison to Other Bariatric Surgery Procedures

Author(s): De Carolis S.; Botta A.; Del Sordo G.; Guerrisi R.; Salvi S.; De Carolis M.P.; Lanzone A.; Iaconelli A.; Giustacchini P.; Raffaelli M.

Source: Obesity Surgery; Oct 2018; vol. 28 (no. 10); p. 3284-3292

Publication Date: Oct 2018

Publication Type(s): Article

PubMedID: 29909515

Abstract: Background: Pregnancy after bariatric surgery (BS) has an increased risk for small-for-gestational-age infants (SGA), shorter length of gestation, and probably perinatal mortality. The aim of this study was to investigate if biliopancreatic diversion could impair pregnancy outcomes in comparison to other bariatric surgery procedures. Method(s): We conducted a cohort retrospective single-center study in 65 women before and after BS. Thirty-one pregnancies occurred before BS, while 109 after BS, amongst which n = 51 after biliopancreatic diversion (BPD) and n = 58 after non-malabsorptive procedures. Result(s): The pregnancy outcomes after BS in comparison with those before BS resulted less affected by diabetes, hypertensive disorders, macrosomia, and large-for-gestational-age (LGA), but more complicated by preterm births (14.5 versus 4.0%) and low birth weight (LBW) infants (28.9 versus 0%). Moreover, mean birth weight resulted lower after BS than before BS ($p < 0.001$). In pregnancies after BPD in comparison to those before BS, the LBW rate (42.5%) resulted a drastic increase ($p < 0.001$), and mean birth weight ($p < 0.001$) and mean birth weight centile ($p < 0.001$) were lower after BPD. When pregnancy outcomes after BPD were compared with those after non-malabsorptive procedures, the rate of congenital anomalies, preterm births, LBW, and SGA resulted an increase ($p = 0.002$, 0.008, 0.032, and < 0.001, respectively). Conclusion(s): BPD drastically reduced diabetes, hypertensive disorders, macrosomia, and LGA; however, it was associated with the poorest pregnancy outcomes in comparison to those observed after other BS procedures. On the basis of the present study, we recommend a cautious multidisciplinary selection of severely obese patients for BPD during the fertile age.

Database: EMBASE

20. Screening and management of gestational diabetes mellitus after bariatric surgery

Author(s): Benhalima K.; Minschart C.; Van Der Schueren B.; Mathieu C.; Ceulemans D.; Devlieger R.; Bogaerts A.

Source: Nutrients; Oct 2018; vol. 10 (no. 10)

Publication Date: Oct 2018

Publication Type(s): Review

PubMedID: 30314289

Abstract: Gestational diabetes mellitus (GDM) is a frequent medical complication during pregnancy. This is partly due to the increasing prevalence of obesity in women of childbearing age. Since bariatric surgery is currently the most successful way to achieve maintained weight loss, increasing numbers of obese women of childbearing age receive bariatric surgery. Bariatric surgery performed before pregnancy significantly reduces the risk to develop GDM but the risk is generally still higher compared to normal weight pregnant women. Women after bariatric surgery therefore still require screening for GDM. However, screening for GDM is challenging in pregnant women after bariatric surgery. The standard screening tests such as an oral glucose tolerance test are often not well tolerated and wide variations in glucose excursions make the diagnosis difficult. Capillary blood glucose measurements may currently be the most acceptable alternative for screening in pregnancy after bariatric surgery. In addition, pregnant women after bariatric surgery have an increased risk for small neonates and need careful nutritional and foetal monitoring. In this review, we address the risk to develop GDM after bariatric surgery, the challenges to screen for GDM and the management of women with GDM after bariatric surgery.

Database: EMBASE

21. Vitamin A and micronutrient deficiencies post-bariatric surgery: aetiology, complications and management in a complex multiparous pregnancy.

Author(s): Mackie, Fiona L; Cooper, Nicola S; Whitticase, Louise J; Smith, Amanda; Martin, William L; Cooper, Sheldon C

Source: European journal of clinical nutrition; Aug 2018; vol. 72 (no. 8); p. 1176-1179

Publication Date: Aug 2018

Publication Type(s): Case Reports Journal Article

PubMedID: 29895848

Available at European journal of clinical nutrition - from ProQuest (Health Research Premium) - NHS Version

Abstract: Adequate vitamin A is essential for healthy pregnancy, but high levels may be teratogenic. We present a patient who underwent bariatric surgery, prior to child bearing, and suffered maternal and foetal complications during eleven pregnancies, possibly associated with vitamin A deficiency, amongst multiple micronutrient deficiencies and risk factors including smoking and obesity. Maternal complications included visual disturbance, night blindness and recurrent infections. Recurrent foetal pulmonary hypoplasia and microphthalmia led to foetal and neonatal loss, not previously described in the medical literature. Current guidance on vitamin A deficiency in pregnancy is focused on developing countries where aetiology of vitamin A deficiency is different to that of women in developed countries. We describe nutritional management of the micronutritient deficiencies, focusing on vitamin A, during her last pregnancy. The need for specific antenatal nutritional guidance for pregnant women post-bariatric surgery is becoming more urgent as more mothers and offspring will be affected.

Database: Medline

22. Maternal and neonatal outcomes after bariatric surgery; a systematic review and meta-analysis: do the benefits outweigh the risks?

Author(s): Kwong, Wilson; Tomlinson, George; Feig, Denice S

Source: American journal of obstetrics and gynecology; Jun 2018; vol. 218 (no. 6); p. 573-580

Publication Date: Jun 2018

Publication Type(s): Meta-analysis Journal Article Systematic Review

PubMedID: 29454871

Abstract:OBJECTIVE DATAObesity during pregnancy is associated with a number of adverse obstetric outcomes that include gestational diabetes mellitus, macrosomia, and preeclampsia. Increasing evidence shows that bariatric surgery may decrease the risk of these outcomes. Our aim was to evaluate the benefits and risks of bariatric surgery in obese women according to obstetric outcomes.STUDYWe performed a systematic literature search using MEDLINE, Embase, Cochrane, Web of Science, and PubMed from inception up to December 12, 2016. Studies were included if they evaluated patients who underwent bariatric surgery, reported subsequent pregnancy outcomes, and compared these outcomes with a control group.STUDY APPRAISAL AND SYNTHESIS METHODSTwo reviewers extracted study outcomes independently, and risk of bias was assessed with the use of the Newcastle-Ottawa Quality Assessment Scale. Pooled odds ratios for each outcome were estimated with the Dersimonian and Laird random effects model.RESULTSAfter a review of 2616 abstracts, 20 cohort studies and approximately 2.8 million subjects (8364 of whom had bariatric surgery) were included in the metaanalysis. In our primary analysis, patients who underwent bariatric surgery showed reduced rates of gestational diabetes mellitus (odds ratio, 0.20; 95% confidence interval, 0.11-0.37, number needed to benefit, 5), large-for-gestational-age infants (odds ratio, 0.31; 95%

confidence interval, 0.17-0.59; number needed to benefit, 6), gestational hypertension (odds ratio, 0.38; 95% confidence interval, 0.19-0.76; number needed to benefit, 11), all hypertensive disorders (odds ratio, 0.38; 95% confidence interval, 0.27-0.53; number needed to benefit, 8), postpartum hemorrhage (odds ratio, 0.32; 95% confidence interval, 0.08-1.37; number needed to benefit, 21), and caesarean delivery rates (odds ratio, 0.50; 95% confidence interval, 0.38-0.67; number needed to benefit, 9); however, group of patients showed an increase in small-for-gestational-age infants (odds ratio, 2.16; 95% confidence interval, 1.34-3.48; number needed to harm, 21), intrauterine growth restriction (odds ratio, 2.16; 95% confidence interval, 1.34-3.48; number needed to harm, 66), and preterm deliveries (odds ratio, 1.35; 95% confidence interval, 1.02-1.79; number needed to harm, 35) when compared with control subjects who were matched for presurgery body mass index. There were no differences in rates of preeclampsia, neonatal intensive care unit admissions, stillbirths, malformations, and neonatal death. Malabsorptive surgeries resulted in a greater increase in small-for-gestational-age infants (P=.0466) and a greater decrease in large-for-gestational-age infants (P=<.0001) compared with restrictive surgeries. There were no differences in outcomes when we used administrative databases vs clinical charts.CONCLUSIONAlthough bariatric surgery is associated with a reduction in the risk of several adverse obstetric outcomes, there is a potential for an increased risk of other important outcomes that should be considered when bariatric surgery is discussed with reproductive-age women.

Database: Medline

23. Pregnancy after bariatric surgery: Maternal and fetal outcomes of 39 pregnancies and a literature review.

Author(s): Costa, Maria Manuel; Belo, Sandra; Souteiro, Pedro; Neves, João S; Magalhães, Daniela; Silva, Rita B; Oliveira, Sofia C; Freitas, Paula; Varela, Ana; Queirós, Joana; Carvalho, Davide

Source: The journal of obstetrics and gynaecology research; Apr 2018; vol. 44 (no. 4); p. 681-690

Publication Date: Apr 2018

Publication Type(s): Journal Article Observational Study

PubMedID: 29349843

Available at The journal of obstetrics and gynaecology research - from Wiley Online Library

Abstract:AIMWe aimed to evaluate the impact of bariatric surgery (BS) on maternal and fetal outcomes.METHODSA retrospective, descriptive, observational study of 39 pregnant women who underwent BS in our institution between 2010 and 2014 was carried out. A sample of women who became pregnant after BS was evaluated, based on data concerning pregnancy, childbirth, and newborns.RESULTSOf the 1182 patients who underwent BS at our institution during the study period, 1016 (85.9%) were women. Thirty-nine of these women (with an average age of 31 ± 4.8 years) became pregnant (one twin pregnancy) and 29 of the 39 had undergone a gastric bypass. The mean time interval between BS and pregnancy was 16.6 ± 4.8 months; however, 16 (41%) women became pregnant less than a year after BS. The pre-BS body mass index (BMI) of the 39 women was 44.5 ± 6.2 kg/m2 . The women had a mean BMI of 30.2 ± 3.8 kg/m2 when they got pregnant and they gained 13.2 ± 7.3 kg during pregnancy. Iron deficiency was observed in 18 (46.1%) women, 16 (45.7%) had vitamin B12 deficiency, 12 (66.8%) had zinc deficiency, and 20 (60.6%) had vitamin D deficiency. Three women developed gestational diabetes mellitus. Premature rupture of membranes occurred in two pregnancies, preterm delivery in five, and there was one spontaneous abortion. Cesarean section was performed in seven cases. The average newborn weight was 3002 ± 587 g, five were small for gestational age, and one had macrosomia. Three infants had to be admitted to an intensive care unit.CONCLUSIONAlthough pregnancy after BS is safe and well tolerated, close monitoring by a multidisciplinary team is required to evaluate complications resulting from BS, especially a deficit of micronutrients.

Database: Medline

24. Hypoglycemia during oral glucose tolerance test among post-bariatric surgery pregnant patients: incidence and perinatal significance.

Author(s): Rottenstreich, Amihai; Elazary, Ram; Ezra, Yossef; Kleinstern, Geffen; Beglaibter, Nahum; Elchalal, Uriel

Source: Surgery for obesity and related diseases : official journal of the American Society for Bariatric Surgery; Mar 2018; vol. 14 (no. 3); p. 347-353

Publication Date: Mar 2018

Publication Type(s): Journal Article

PubMedID: 29306610

Abstract:BACKGROUNDWhile hypoglycemia during an oral glucose tolerance test (OGTT) has been shown to occur in a considerable portion of nonpregnant post-bariatric surgery (BS) patients, its incidence among pregnant post-BS patients evaluated for gestational diabetes has only been sparsely studied.OBJECTIVESWe investigated OGTT results and pregnancy outcomes in pregnant women who underwent 3 types of bariatric procedures before pregnancy.SETTINGA university hospital.METHODSFrom medical records, data were collected on glucose measurements during a 100-g, 3-hour OGTT, as well as maternal and fetal outcomes.RESULTSOf 119 post-BS pregnant patients included in the study, 55 underwent laparoscopic sleeve gastrectomy, 34 laparoscopic adjustable gastric banding, and 30 laparoscopic Roux-en-Y gastric bypass surgery. Hypoglycemia (<55 mg/dL) was encountered in 59 (49.6%) patients during the OGTT. Among them, the nadir plasma glucose levels occurred 2 hours after glucose ingestion in 25 (42.4%) and after 3 hours in 34 (57.6%), with a median value of 47 (44-52) mg/dL. The risk of hypoglycemia was higher among women with prior laparoscopic Roux-en-Y gastric bypass surgery (83.3%) than among those with prior laparoscopic sleeve gastrectomy (54.5%; P = .009) or laparoscopic adjustable gastric banding (11.8%; P<.0001). Time from surgery to conception was significantly shorter among women with evidence of hypoglycemia during OGTT (median 711 versus 1246 days, P = .002). Compared with patients without evidence of hypoglycemia, patients who experienced hypoglycemia had lower rates of gestational diabetes (P = .03) but higher proportions of low birth weight (P = .01) and small for gestational age infants (P = .03).CONCLUSIONSBecause hypoglycemia is common during OGTT among post-BS parturients, other diagnostic methods should be considered in this setting. The association found between hypoglycemia and poor fetal growth warrants investigation as to whether interventions to prevent hypoglycemia will improve fetal outcome.

Database: Medline

25. Maternal and Perinatal Outcomes After Laparoscopic Sleeve Gastrectomy.

Author(s): Rottenstreich, Amihai; Elchalal, Uriel; Kleinstern, Geffen; Beglaibter, Nahum; Khalaileh, Abed; Elazary, Ram

Source: Obstetrics and gynecology; Mar 2018; vol. 131 (no. 3); p. 451-456

Publication Date: Mar 2018

Publication Type(s): Journal Article

PubMedID: 29420411

Abstract:OBJECTIVETo examine associations of laparoscopic sleeve gastrectomy with maternal and perinatal outcomes.METHODSWe conducted a retrospective case-control study of deliveries that occurred from 2006 to 2016 at two university hospitals. The study group comprised all women who had undergone laparoscopic sleeve gastrectomy and who delivered during the study period. If a woman had more than one pregnancy during the study period, data from only her first pregnancy were used. A control group was established by matching preoperative body mass index (BMI), age, parity, delivery history, and delivery year.RESULTSData from 238 women were analyzed, 119 post-laparoscopic sleeve gastrectomy and 119 matched control parturients. Among the post-laparoscopic sleeve gastrectomy patients, the median preoperative BMI was 41.7 (interquartile range 39.9-44.4) and the median postoperative BMI was 28.9 (26.6-32.0). Compared with the control group, the study group had lower rates of gestational diabetes mellitus (3.4% vs 17.6%, P=.001), large-for-gestational-age neonates (1.7% vs 19.3%, P=.001), and birth weight greater than 4,000 g (0.8% vs 7.6%, P=.02) but higher proportions of small-for-gestational-age (SGA) neonates (14.3% vs 4.2%, P=.01) and low-birth-weight neonates (12.6% vs 4.2%, P=.03). Rates of gestational hypertensive disorders and prematurity were comparable between the groups. For the study group, hemoglobin levels were lower in early pregnancy (median 12.6 vs 13.2 g/dL, P=.001) and after delivery (10.5 vs 10.8 g/dL, P=.002), and a higher proportion of patients were treated with intravenous iron supplementation during pregnancy (14.3% vs 0.8%, P=.001). Cesarean delivery rates during labor were lower in the study group (10.1% vs 20.2%, P=.04).CONCLUSIONLaparoscopic sleeve gastrectomy was associated with reduced rates of gestational diabetes mellitus, excessive fetal growth, and cesarean delivery and an increased rate of SGA and low-birth-weight neonates.

Database: Medline

26. Oral Contraceptives after Bariatric Surgery.

Author(s): Schlatter, Joël

Source: Obesity facts; 2017; vol. 10 (no. 2); p. 118-126

Publication Date: 2017

Publication Type(s): Journal Article Review

PubMedID: 28433989

Available at Obesity facts - from Unpaywall

Abstract:OBJECTIVEBariatric surgery offers a highly effective mode of treatment for obese patients. Some procedures such as bypass cause an alteration in normal gastrointestinal tract with possible consequences for the uptake of orally administered drugs.METHODSWe assessed the literature to ascertain whether the use of oral drugs and especially oral contraceptives is effective and adequate after bariatric surgery.RESULTSThe bioavailability of drugs could be affected by the solubility and pH of the modified medium after bariatric surgery and by the loss of gastrointestinal transporters. Bariatric surgery could potentially result in a transient change in the absorption of drugs such as analgesics, antibiotics, antiarrhythmics, anticoagulants, psychotropic, and oral contraceptive drugs. Effective contraception is especially critical in the postoperative period, and implants might be representing a safe contraceptive method in women undergoing bariatric surgery.CONCLUSIONEach drug will have to be evaluated with respect to its site of absorption and its mechanism of absorption, with special attention on parameters influencing the effectiveness of the absorption processes.

Database: Medline

27. Maternal Nutritional Deficiencies and Small-for-Gestational-Age Neonates at Birth of Women Who Have Undergone Bariatric Surgery.

Author(s): Hazart, J; Le Guennec, D; Accoceberry, M; Lemery, D; Mulliez, A; Farigon, N; Lahaye, C; Miolanne-Debouit, M; Boirie, Y

Source: Journal of pregnancy; 2017; vol. 2017 ; p. 4168541

Publication Date: 2017

Publication Type(s): Journal Article

PubMedID: 29082043

Available at Journal of pregnancy - from Europe PubMed Central - Open Access

Available at Journal of pregnancy - from Unpaywall

Abstract: The aim is to compare the prevalence of maternal deficiencies in micronutrients, the obstetrical and neonatal complications after bariatric surgery according to surgical techniques, the time between surgery and conception, and BMI at the onset of pregnancy. A retrospective cohort study concerned 57 singleton pregnancies between 2011 and 2016 of 48 adult women who have undergone bariatric surgery. Small-for-gestational-age neonates were identified in 36.0% of pregnancies. With supplements intake (periconceptional period: 56.8%, trimester 1 (T1): 77.8%, T2: 96.3%, and T3: 100.0%), nutritional deficiencies involved vitamins A (T1: 36.4%, T2: 21.1%, and T3: 40.0%), D (T1: 33.3%, T2: 26.3%, and T3: 8.3%), C (T1: 66.7%, T2: 41.2%, and T3: 83.3%), B1 (T1: 45.5%, T2: 15.4%, and T3: 20.0%), and B9 (T1: 14.3%, T2: 0%, and T3: 9.1%) and selenium (T1: 77.8%, T2: 22.2%, and T3: 50.0%). There was no significant difference in the prevalence of nutritional deficiencies and complications according to surgery procedures and in the prevalence of pregnancy issues according to BMI at the beginning of the pregnancy and time between surgery and pregnancy. Prevalence of micronutritional deficiencies and small-for-gestational-age neonates is high in pregnant women following bariatric surgery. Specific nutritional programmes should be recommended for these women.

Database: Medline

28. Experience with FreeStyle Libre Flash glucose monitoring system in management of refractory dumping syndrome in pregnancy shortly after bariatric surgery.

Author(s): Novodvorsky, Peter; Walkinshaw, Emma; Rahman, Waliur; Gordon, Valerie; Towse, Karen; Mitchell, Sarah; Selvarajah, Dinesh; Madhuvrata, Priya; Munir, Alia

Source: Endocrinology, diabetes & metabolism case reports; 2017; vol. 2017

Publication Date: 2017

Publication Type(s): Journal Article

PubMedID: 29302329

Available at Endocrinology, diabetes & metabolism case reports - from Europe PubMed Central - Open Access

Available at Endocrinology, diabetes & metabolism case reports - from Unpaywall

Abstract: Bariatric surgery is an effective therapy for obesity but is associated with long-term complications such as dumping syndromes and nutritional deficiencies. We report a case of a 26-year-old caucasian female, with history of morbid obesity and gestational diabetes (GDM), who became pregnant 4 months after Roux-en-Y bypass surgery. She developed GDM during subsequent pregnancy, which was initially managed with metformin and insulin. Nocturnal hypoglycaemia causing sleep disturbance and daytime somnolence occured at 19 weeks of pregnancy (19/40). Treatment with rapid-acting carbohydrates precipitated further hypoglycaemia. Laboratory investigations confirmed hypoglycaemia at 2.2 mmol/L with appropriately low insulin and C-peptide, intact HPA axis and negative IgG insulin antibodies. The patient was seen regularly by the bariatric dietetic team but concerns about compliance persisted. A FreeStyle Libre system was used from 21/40 enabling the patient a real-time feedback of changes in interstitial glucose following high or low GI index food intake. The patient declined a trial of acarbose but consented to an intraveneous dextrose infusion overnight resulting in improvement but not complete abolishment of nocturnal hypoglycaemia. Hypoglycaemias subsided at 34/40 and metformin and insulin had to be re-introduced due to high post-prandial blood glucose readings. An emergency C-section was indicated at 35 + 1/40 and a small-for-gestational-age female was delivered. There have been no further episodes of hypoglycaemia following delivery. This case illustrates challenges in the management of pregnancy following bariatric surgery. To our knowledge, this is the first use of FreeStyle Libre in dumping syndrome in pregnancy following bariatric surgery with troublesome nocturnal hypoglycaemia.Learning pointsBariatric surgery represents the most effective treatment modality in cases of severe obesity. With increasing prevalence of obesity, more people are likely to undergo bariatric procedures, many of which are women of childbearing age.Fertility generally improves after bariatric surgery due to weight reduction, but pregnancy is not recommended for at least 12-24 months after surgery. If pregnancy occurs, there are currently little evidence-based guidelines available on how to manage complications such as dumping syndromes or gestational diabetes (GDM) in women with history of bariatric surgery.Diagnosis of GDM relies on the use of a 75 g oral glucose tolerance test (OGTT). The use of this test in pregnant women is not recommended due to its potential to precipitate dumping syndrome. Capillary glucose monitoring profiles or continuous glucose monitoring (CGM) is being currently discussed as alternative testing modalities.As the CGM technology becomes more available, including the recently introduced FreeStyle Libre Flash glucose monitoring system, more pregnant women, including those after bariatric surgery, will have access to this technology. We suggest urgent development of guidelines regarding the use of CGM and flash glucose monitoring tools in these circumstances and in the interim recommend careful consideration of their use on a case-to-case basis.

Database: Medline

29. Contraception and conception after bariatric surgery

Author(s): Menke M.N.; King W.C.; White G.E.; Gosman G.G.; Courcoulas A.P.; Dakin G.F.; Flum D.R.; Orcutt M.J.; Pomp A.; Pories W.J.; Purnell J.Q.; Steffen K.J.; Wolfe B.M.; Yanovski S.Z.

Source: Obstetrics and Gynecology; 2017; vol. 130 (no. 5); p. 979-987

Publication Date: 2017

Publication Type(s): Article

PubMedID: 29016506

Abstract: Objective: To examine contraceptive practices and conception rates after bariatric surgery. Method(s): The Longitudinal Assessment of Bariatric Surgery-2 is a multicenter, prospective cohort study of adults undergoing first-time bariatric surgery as part of routine clinical care at 10 U.S. hospitals. Recruitment occurred between 2005 and 2009. Participants completed preoperative and annual postsurgical assessments for up to 7 years until January 2015. This report was restricted to women 18-44 years old with no history of menopause, hysterectomy, or estrogen and progesterone therapy. Primary outcomes were self-reported contraceptive practices, overall conception rate, and early (less than 18 months) postsurgical conception. Contraceptive practice (no intercourse, protected intercourse, unprotected intercourse, or tried to conceive) was classified based on the preceding year. Conception rates were determined from self-reported pregnancies. Result(s): Of 740 eligible women, 710 (95.9%) completed follow-up assessment(s). Median (interquartile range) preoperative age was 34 (30-39) years. In the first postsurgical year, 12.7% (95% CI 9.4-16.0) of women had no intercourse, 40.5% (95% CI 35.6-45.4) had protected intercourse only, 41.5% (95% CI 36.4-46.6) had unprotected intercourse while not trying to conceive, and 4.3% (95% CI 2.4-6.3) tried to conceive. The prevalence of the first three groups did not significantly differ across the 7 years of follow-up (P for all >.05); however, more women tried to conceive in the second year (13.1%, 95% CI 9.3-17.0; P<.001). The conception rate was 53.8 (95% CI 40.0-71.1) per 1,000 woman-years across follow-up (median [interquartile range] 6.5 [5.9-7.0] years); 42.3 (95% CI 30.2-57.6) per 1,000 woman-years in the 18 months after surgery. Age (adjusted relative risk 0.41 [95% CI 0.19-0.89] per 10 years, P=.03), being married or living as married (adjusted relative risk 4.76 [95% CI 2.02-11.21], P<.001), and rating future pregnancy as important preoperatively (adjusted relative risk 8.50 [95% CI 2.92-24.75], P<.001) were associated with early conception. Conclusion(s): Postsurgical contraceptive use and conception rates do not reflect recommendations for an 18-month delay in conception after bariatric surgery.

Database: EMBASE

30. Pregnancy and bariatric surgery.

Author(s): Mahawar, Kamal K

Source: Minerva chirurgica; Dec 2017; vol. 72 (no. 6); p. 538-545

Publication Date: Dec 2017

Publication Type(s): Journal Article Review

PubMedID: 28621511

Abstract:INTRODUCTIONA large number of women experience pregnancy after bariatric surgery. The purpose of this review was to understand the evidence base in this area to come up with practical, evidence-based recommendations.EVIDENCE ACQUISITIONWe examined PubMed for all published articles on pregnancy in patients who have previously undergone a bariatric surgery.EVIDENCE SYNTHESISThere is an increasing body of evidence pointing towards a beneficial effect of weight loss induced by bariatric surgery on female and male fertility prompting calls for recognition of infertility as a qualifying co-morbidity for patients between the Body Mass Index of 35.0 kg/m2 and 40.0 kg/m2. Women in childbearing age group should be routinely offered contraceptive advice after bariatric surgery and advised to avoid pregnancy until their weight has stabilized. Until more focused studies are available, the advice to wait for 12 months or 2 months after the weight loss has stabilized, whichever is latter, seems reasonable. Patients should be advised to seek clearance from their bariatric teams prior to conception and looked after by a multi-disciplinary team of women health professionals, bariatric surgeons, and dietitians during pregnancy. The main objective of care is to ensure adequate nutritional state to allow for a satisfactory weight gain and fetal growth.CONCLUSIONSThere is a relative lack of studies and complete lack of Level 1 evidence to inform practice in this area. This review summarizes current literature and makes a number of practical suggestions for routine care of these women while we develop evidence to better inform future practice.

Database: Medline

31. Assessment of glucose regulation in pregnancy after gastric bypass surgery.

Author(s): Göbl, Christian S; Bozkurt, Latife; Tura, Andrea; Leutner, Michael; Andrei, Laura; Fahr, Lukas; Husslein, Peter; Eppel, Wolfgang; Kautzky-Willer, Alexandra

Source: Diabetologia; Dec 2017; vol. 60 (no. 12); p. 2504-2513

Publication Date: Dec 2017

Publication Type(s): Journal Article

PubMedID: 28918470

Abstract:AIMS/HYPOTHESISRoux-en-Y gastric bypass (RYGB) surgery is characterised by glycaemic variability. Prospective studies of glucose metabolism in pregnancy after RYGB are not available, therefore this study aimed to evaluate physiological alterations in glucose metabolism in pregnancy following RYGB.METHODSSixty-three pregnant women (25 who underwent RYGB, 19 non-operated obese control women and 19 normal weight control women) were included. Frequently sampled 3 h OGTTs and 1 h IVGTTs were performed between 24 and 28 weeks of gestation and, in a subgroup, were repeated at 3-6 months after delivery.RESULTSWe observed major alterations in glucose kinetics during the OGTT, including an early increase in plasma glucose followed by hypoglycaemia in 90% of women who had previously undergone RYGB. The higher degree of glycaemic variability in this group was accompanied by increased insulin, C-peptide and glucagon concentrations after oral

glucose load, whereas no differences in insulin response were observed after parenteral glucose administration (RYGB vs normal weight). IVGTT data suggested improved insulin sensitivity (mean difference 0.226 × 10-4 min-1 [pmol/l]-1 [95% CI 0.104, 0.348]; p < 0.001) and disposition index in pregnancies after RYGB when compared with obese control women. However, subtle alterations in insulin action and beta cell function were still observed when comparing women who had undergone RYGB with the normal-weight control group. Moreover, we observed that fetal growth was associated with maternal glucose nadir levels and insulin secretion in offspring of those who had previously undergone RYGB.CONCLUSIONS/INTERPRETATIONPregnancies after RYGB are affected by altered postprandial glucose, insulin and C-peptide dynamics. Insulin sensitivity is improved by RYGB, although subtle alterations in beta cell function are observed. Longitudinal studies are needed to assess potential consequences for fetal development and pregnancy outcomes.

Database: Medline

32. Nutrient deficiency and obstetrical outcomes in pregnant women following Roux-en-Y gastric bypass: A retrospective Danish cohort study with a matched comparison group.

Author(s): Hammeken, Lianna Hede; Betsagoo, Ramsina; Jensen, Ann Nygaard; Sørensen, Anne Nødgaard; Overgaard, Charlotte

Source: European journal of obstetrics, gynecology, and reproductive biology; Sep 2017; vol. 216 ; p. 56-60

Publication Date: Sep 2017

Publication Type(s): Journal Article

PubMedID: 28732251

Abstract:OBJECTIVERoux-en-Y gastric bypass surgery and small-for-gestational-age births are known to be associated although the etiology is not fully understood. This study aimed to investigate pregnancy outcomes and maternal nutritional status among pregnant women with a history of Roux-en-Y gastric bypass using maternal anemia and gestational weight gain as indicators of micronutrient and macronutrient deficiency in pregnancy.STUDY DESIGNThe study was designed as a retrospective matched cohort study. All Roux-en-Y-gastric-bypass-operated pregnant women (n=151) who were followed in the outpatient obstetric clinic at Aalborg University Hospital in Denmark and gave birth between 1 January 2010 and 31 December 2013 were included. Each Roux-en-Y-gastric-bypass-operated woman was closely matched with a non-Roux-en-Y-gastric-bypass-operated woman. Primary outcomes were small-for-gestational-age birth, maternal anemia and gestational weight gain. The two groups (matched 1:1) were compared by paired tests on all measures, conditional logistic regression for paired binary data and the paired t-test or Wilcoxon signed-rank test for paired continuous data.RESULTSThe risk of small-for-gestational-age birth (odds ratio (OR)=2.67, 95% confidence interval (CI); 1.04-6.82) and maternal anemia (OR=3.0, 95% CI; 1.09-8.25) were significantly increased for the Roux-en-Y gastric bypass group compared to the non-Roux-en-Y gastric bypass group. No significant difference was found in gestational weight gain (p=0.169) between women with a history of Roux-en-Y gastric bypass (11.51kg±8.97 standard deviation (SD)) and non- Roux-en-Y-gastric-bypass-operated women (12.18kg±6.28 SD).CONCLUSIONA history of Roux-en-Y gastric bypass surgery increases the risk of small-for-gestational-age birth and anemia, while a finding of differences in gestational weight gain is uncorroborated. Our findings suggest a role of micronutrient deficiency rather than reduced gestational weight gain in the etiology of small-for-gestational-age birth among women with a history of Roux-en-Y gastric bypass surgery.

Database: Medline

33. Risk of low birth weight and micronutrient deficiencies in neonates from mothers after gastric bypass: a case control study.

Author(s): Gascoin, Geraldine; Gerard, Maxime; Sallé, Agnès; Becouarn, Guillaume; Rouleau, Stephanie; Sentilhes, Loïc; Coutant, Régis

Source: Surgery for obesity and related diseases : official journal of the American Society for Bariatric Surgery; Aug 2017; vol. 13 (no. 8); p. 1384-1391

Publication Date: Aug 2017

Publication Type(s): Journal Article Observational Study

PubMedID: 28526433

Abstract:BACKGROUNDAn increased risk of small-for-gestational-age infants after maternal bariatric surgery has been shown. The risk of micronutrients deficiencies in these neonates is unclear.OBJECTIVETo screen for micronutrients deficiencies in newborns of mothers with gastric bypass.SETTINGSUniversity hospital in Angers, France.METHODSThis study compared the clinical and cord blood biological characteristics of 56 newborns of mothers with prior Roux-en-Y gastric bypass (RYGB) and 56 newborns of nonobese healthy mothers after normal pregnancy (controls), followed between January 3, 2008 and October 31, 2012. Cord blood micronutrients concentrations from controls were used for establishing normative data. After RYGB, the women took daily micronutrients supplements.RESULTSRYGB mothers lost 18.1±6.3 kg/m2 of body mass index (BMI) in the 11-69 months between surgery and pregnancy onset (percentage of excess weight loss 79±20%), reaching BMI of 30.1±6.0 kg/m2 compared with 22.3±4.0 kg/m2 in the controls (P<.05). Neonates born to RYGB mothers were small-for-gestational-age in 23% of cases versus 3.6% in the control group (P<.01). A higher percentage of RYGB neonates had cord blood concentrations below the 2.5 percentile for calcium (19% versus 2%), zinc (13% versus 3%,), iron (19% versus 2%), and vitamin A (13% versus 3%), and over the 97.5 percentile for magnesium (13% versus 3%), vitamin E (16% versus 3%), 25-hydroxy-vitamin D (13% versus 2%), and vitamin B12 (14% versus 2%) (P<.05 for all comparisons).CONCLUSIONNeonates from RYGB mothers showed cord blood micronutrient differences compared with neonates from healthy mothers. The comparison with neonates from morbidly obese women is still to be done.

Database: Medline

34. Pregnancy after Bariatric Surgery: Balancing Risks and Benefits.

Author(s): Carreau, Anne-Marie; Nadeau, Mélanie; Marceau, Simon; Marceau, Picard; Weisnagel, S John

Source: Canadian journal of diabetes; Aug 2017; vol. 41 (no. 4); p. 432-438

Publication Date: Aug 2017

Publication Type(s): Journal Article Review

PubMedID: 28365201

Available at Canadian journal of diabetes - from Free Medical Journals . com

Abstract: The majority of bariatric surgeries in Canada are performed in women of reproductive age. Clinicians encounter more and more often pregnancies that occur after bariatric surgeries. The appropriate management and education of women who want to conceive after bariatric surgery is still unclear due to the lack of consistent data about maternal and neonatal outcomes following bariatric surgery. Maternal obesity during pregnancy confers a higher risk for gestational diabetes, hypertensive disorders, congenital malformations, prematurity and perinatal mortality. Generally, pregnancies in severely obese women who have undergone bariatric surgery are safe, and the women are at significantly lower risk for gestational diabetes, hypertensive disorders and large-for-gestational-age neonates, but the surgery confers a higher risk for small-for-gestational-age infants and prematurity. This review aims to provide evidence from recent publications about the risks and benefits of bariatric surgeries in the context of future pregnancies.

Database: Medline

35. Pregnancy After Roux en Y Gastric Bypass: Nutritional and Biochemical Aspects

Author(s): Gimenes J.C.; Nicoletti C.F.; de Souza Pinhel M.A.; de Oliveira B.A.P.; Marchini J.S.; Nonino C.B.; Salgado Junior W.

Source: Obesity Surgery; Jul 2017; vol. 27 (no. 7); p. 1815-1821

Publication Date: Jul 2017

Publication Type(s): Article

PubMedID: 28102495

Available at Obesity Surgery - from SpringerLink - Medicine

Available at Obesity Surgery - from ProQuest (Health Research Premium) - NHS Version

Abstract: Introduction: Although pregnancy after bariatric surgery is related to risk reduction, nutritional complications may occur. This study aimed to evaluate nutritional and biochemical indicators of women who became pregnant after Roux en Y gastric bypass (RYGB). Material(s) and Method(s): We carried out a retrospective study with women who became pregnant after RYGB. We evaluated anthropometric, biochemical, and dietary intake indicators in the preoperative period and before, during, and after pregnancy by analysis of medical records. Shapiro-Wilk test and ANOVA for repeated measures were performed ($p < 0.05$). Result(s): The study included 25 patients (35.7 +/- 3.8 years), who became pregnant 31.3 +/- 21.7 months after RYGB. Weight loss until the beginning of pregnancy was 32.4%, and the gestational weight gain was 3.8 +/- 12 kg. There was a higher frequency of patients with hypertension in the preoperative time when compared to that during the pregnancy period. Total cholesterol (180.9 +/- 24.8 versus 148.5 +/- 30.4 mg/dL), LDL-cholesterol (103.5 +/- 19.2 versus 85.8 +/- 23.1 mg/dL), HDL-cholesterol (56.4 +/- 8 versus 46.9 +/- 8.7 mg/dL), and latent iron-binding capacity (337.6 +/- 95.8 versus 277.8 +/- 65 mug/dL) were higher during the pregnancy compared to that before the pregnancy, while hemoglobin values (11.2 +/- 1 versus 12.3 +/- 1.2 g/dL) and sodium (138.8 +/- 2.9 versus 141 +/- 3 mmol/L) were lower. No differences of food intake were found among times. There is no difference on gestational weight gain between women

who became pregnant before or after the first year. Conclusion(s): During pregnancy, there was an expected weight gain and maintenance of the lipid profile within the normal range; however, there was a reduction of hemoglobin levels. These findings show the need for individualized follow-up with adequate nutritional intervention in the event of deficiencies.

Database: EMBASE

36. Pregnancy and perinatal outcomes according to surgery to conception interval and gestational weight gain in women with previous gastric bypass.

Author(s): Stentebjerg, Louise Laage; Andersen, Lise Lotte Torvin; Renault, Kristina; Støving, René Klinkby; Jensen, Dorte Møller

Source: The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians; May 2017; vol. 30 (no. 10); p. 1182-1188

Publication Date: May 2017

Publication Type(s): Journal Article

PubMedID: 27426696

Abstract:OBJECTIVETo compare perinatal and pregnancy outcomes including adherence to the Institute of Medicine's (IOM) recommendations for gestational weight gain (GWG) in pregnant women with conception <18 months (early group) compared to ≥18 months following gastric bypass (late group).METHODSRetrospective cohort study comprising 71 women with gastric bypass and a singleton pregnancy presenting at Odense University Hospital, November 2007-October 2013. Data were extracted from medical records and laboratory systems. The primary outcomes were timing of pregnancy and adherence to the IOM's recommendations for GWG. Secondary outcomes were birthweight, preterm delivery, cesarean section (CS), iron deficiency and post partum hemorrhage (PPH).RESULTSForty-three (61%) women conceived less than 18 months after gastric bypass surgery. Women in the late group had a significantly higher risk of requiring CS or receiving intravenous iron supplementation compared to the early group (57% versus 30%, p = 0.03 and 29% versus 7%, p = 0.02, respectively). Early conception was not significantly associated with insufficient GWG, preterm delivery or birthweight. Among 54 women with information on GWG, only 13 (24%) had an appropriate GWG.CONCLUSIONThe majority of pregnant women with gastric bypass did not fulfill guidelines for GWG; however, this study could not support the recommendation to postpone pregnancy.

Database: Medline

37. Bariatric Surgery in Women of Childbearing Age, Timing Between an Operation and Birth, and Associated Perinatal Complications.

Author(s): Parent, Brodie; Martopullo, Ira; Weiss, Noel S; Khandelwal, Saurabh; Fay, Emily E; Rowhani-Rahbar, Ali

Source: JAMA surgery; Feb 2017; vol. 152 (no. 2); p. 128-135

Publication Date: Feb 2017

Publication Type(s): Journal Article

PubMedID: 27760265

Abstract: ImportanceMetabolic changes after maternal bariatric surgery may affect subsequent fetal development. Many relevant perinatal outcomes have not been studied in this postoperative population, and the risks associated with short operation-to-birth (OTB) intervals have not been well examined.ObjectiveTo examine the risk for perinatal complications in women with a history of bariatric surgery (postoperative mothers [POMs]) by comparing them with mothers without operations (nonoperative mothers [NOMs]) and examining the association of the OTB interval with perinatal outcomes.Design, Setting, and ParticipantsThis investigation was a population-based retrospective cohort study (January 1, 1980, to May 30, 2013) at hospitals in Washington State. Data were collected from birth certificates and maternally linked hospital discharge data. Participants were all POMs and their infants (n = 1859) and a population-based random sample of NOMs and their infants frequency matched by delivery year (n = 8437).ExposuresBariatric operation before birth or categories of OTB intervals.Main Outcomes and MeasuresThe primary outcomes were prematurity, neonatal intensive care unit (NICU) admission, congenital malformation, small for gestational age (SGA), birth injury, low Apgar score (≤8), and neonatal mortality. Poisson regression was used to compute relative risks (RRs) and 95% CIs, with adjustments for maternal body mass index, delivery year, socioeconomic status, age, parity, and comorbid conditions.ResultsA total of 10 296 individuals were included in the analyses for this study. In the overall cohort, the median age was 29 years (interquartile range, 24-33 years). Compared with infants from NOMS, infants from POMs had a higher risk for prematurity (14.0% vs 8.6%; RR, 1.57; 95% CI, 1.33-1.85), NICU admission (15.2% vs 11.3%; RR, 1.25; 95% CI, 1.08-1.44), SGA status (13.0% vs 8.9%; RR, 1.93; 95% CI, 1.65-2.26), and low Apgar score (17.5% vs 14.8%; RR, 1.21; 95% CI, 1.06-1.37). Compared with infants from mothers with greater than a 4-year OTB interval, infants from mothers with less than a 2-year interval had higher risks for prematurity (11.8% vs 17.2%; RR, 1.48; 95% CI, 1.00-2.19), NICU admission (12.1% vs 17.7%; RR, 1.54; 95% CI, 1.05-2.25), and SGA status (9.2% vs 12.7%; RR, 1.51; 95% CI, 0.94-2.42).Conclusions and RelevanceInfants of mothers with a previous bariatric operation had a greater likelihood of perinatal complications compared with infants of NOMs. Operation-to-birth intervals of less than 2 years were associated with higher risks for prematurity, NICU admission, and SGA status compared with longer intervals. These findings are relevant to women with a history of bariatric surgery and could inform decisions regarding the optimal timing between an operation and conception.

Database: Medline

38. Perinatal Outcomes and the Influence of Maternal Characteristics After Roux-en-Y Gastric Bypass Surgery.

Author(s): Chagas, Cristiane; Saunders, Cláudia; Pereira, Silvia; Silva, Jacqueline; Saboya, Carlos; Ramalho, Andréa

Source: Journal of women's health (2002); Jan 2017; vol. 26 (no. 1); p. 71-75

Publication Date: Jan 2017

Publication Type(s): Journal Article

PubMedID: 27912030

Abstract:OBJECTIVEAssess the perinatal outcomes and identify what maternal characteristics can influence them in women who had undergone Roux-en-Y gastric bypass (RYGB).MATERIALS AND METHODSAnalytical, prospective, and longitudinal study with pregnant adult women.INCLUSION CRITERIAchronological age >20 years; singleton pregnancy; RYGB surgery before pregnancy.EXCLUSION CRITERIAprior malabsorptive or restrictive surgeries; malabsorption syndrome. Data analysis was performed using SPSS statistics software, version 17.RESULTSThirty pregnant women with 30.22 ± 4.38 years, the interval between surgery and the date of last menstrual period was 17.7 ± 9.07 months. The average prepregnancy body mass index was characterized as overweight (27.36 ± 3.26 kg/m2), total gestational weight gain was 7.68 ± 3.73 kg. The most common pregnancy complications were anemia (73.3%), urinary tract infection (33.4%), and dumping syndrome (33.4%). As for newborns, 58% were male, with a mean of 39.28 ± 0.84 weeks, 90% were classified as appropriate for gestational age, and 93.4% were born at term with adequate weight (39.28 ± 0.84 weeks and 3128.79 ± 271.49 g). Positive and significant correlation was observed between gestational weekly gain in the first trimester and birth weight ($r = 0.42$, $p = 0.024$) and between gestational weekly gain in the second trimester and birth weight ($r = 0.48$, $p = 0.008$).CONCLUSIONSDespite the completion of RYGB, in general, there was no apparent fetal compromise when considering the analysis of the variables proposed by this study.

Database: Medline

39. Altered glucose profiles and risk for hypoglycaemia during oral glucose tolerance testing in pregnancies after gastric bypass surgery.

Author(s): Feichtinger, Michael; Stopp, Tina; Hofmann, Sandra; Springer, Stephanie; Pils, Sophie; Kautzky-Willer, Alexandra; Kiss, Herbert; Eppel, Wolfgang; Tura, Andrea; Bozkurt, Latife; Göbl, Christian S

Source: Diabetologia; Jan 2017; vol. 60 (no. 1); p. 153-157

Publication Date: Jan 2017

Publication Type(s): Journal Article

PubMedID: 27757488

Available at Diabetologia - from SpringerLink - Medicine

Available at Diabetologia - from ProQuest (Health Research Premium) - NHS Version

Available at Diabetologia - from Unpaywall

Abstract:AIMS/HYPOTHESISA history of gastric bypass surgery can influence the results of the OGTT recommended during pregnancy. Therefore, we compared OGTT glucose kinetics and pregnancy outcome between pregnant gastric bypass patients and BMI-matched, lean and obese controls.METHODSMedical records were used to collect data on glucose measurements during the 2 h 75 g OGTT as well as on pregnancy and fetal outcome for 304 women (n = 76 per group, matched for age and date of delivery).RESULTSWomen after bariatric surgery had lower fasting glucose levels compared with lean, obese and BMI-matched controls, and showed altered postprandial glucose kinetics, including a rise at 60 min followed by hypoglycaemia with serum glucose of <3.34 mmol/l (which occurred in 54.8%). Moreover, their risk of pre-eclampsia or gestational hypertension was reduced, with an increased risk of delivering small for gestational age infants.CONCLUSIONS/INTERPRETATIONAlternative strategies to accurately define impaired glucose metabolism in pregnancies after bariatric surgery should be explored.

Database: Medline

40. The use of contraception for patients after bariatric surgery.

Author(s): Ostrowska, Lucyna; Lech, Medard; Stefańska, Ewa; Jastrzębska-Mierzyńska, Marta; Smarkusz, Joanna

Source: Ginekologia polska; 2016; vol. 87 (no. 8); p. 591-593

Publication Date: 2016

Publication Type(s): Journal Article

PubMedID: 27629135

Available at Ginekologia polska - from Free Medical Journals . com

Available at Ginekologia polska - from Unpaywall

Abstract: Obesity in women of reproductive age is a serious concern regarding reproductive health. In many cases of infertility in obese women, reduction of body weight may lead to spontaneous pregnancy, without the need for more specific methods of treatment. Bariatric surgery is safe and is the most effective method for body weight reduction in obese and very obese patients. In practice there are two bariatric techniques; gastric banding, which leads to weight loss through intake restriction, and gastric bypass, leads to weight loss through food malabsorption. Gastric bypass surgery (the more frequently performed procedure), in most cases, leads to changes in eating habits and may result in vomiting, diarrhea and rapid body mass reduction. There are reliable data describing the continuous increase in the number of women who are trying to conceive, or are already pregnant, following bariatric surgery. Most medical specialists advise women to avoid

pregnancy within 12-18 months after bariatric surgery. This allows for time to recover sufficiency from the decreased absorption of nutrients caused by the bariatric surgery. During this period there is a need for the use of reliable contraception. As there is a risk for malabsorption of hormones taken orally, the combined and progestogen-only pills are contraindicated, and displaced by non-oral hormonal contraception or non-hormonal methods, including intrauterine devices and condoms.

Database: Medline

41. Pregnancy outcomes in women with bariatric surgery as compared with morbidly obese women

Author(s): Abenhaim H.A.; Alrowaily N.; Klam S.L.; Czuzoj-Shulman N.; Spence A.R.

Source: Journal of Maternal-Fetal and Neonatal Medicine; Nov 2016; vol. 29 (no. 22); p. 3596-3601

Publication Date: Nov 2016

Publication Type(s): Article

PubMedID: 26785778

Abstract: Objective: Pregnancies among morbidly obese women are associated with serious adverse maternal and neonatal outcomes. Our study objective is to evaluate the effect of bariatric surgery on obstetrical outcomes. Method(s): We carried out a retrospective cohort study using the healthcare cost and utilization project - Nationwide Inpatient Sample from 2003 to 2011 comparing outcome of births among women who had undergone bariatric surgery with births among women with morbid obesity. Logistic regression was used to estimate the adjusted effect of bariatric surgery on maternal and newborn outcomes. Result(s): There were 8 475 831 births during the study period (221 580 (2.6%) in morbidly obese women and 9587 (0.1%) in women with bariatric surgery). Women with bariatric surgery were more likely to be Caucasian and >=35 years old as compared with morbidly obese women. As compared with women with morbid obesity, women with bariatric surgery had lower rates of hypertensive disorders, premature rupture of membrane, chorioamnionitis, cesarean delivery, instrumental delivery, postpartum hemorrhage, and postpartum infection. Induction of labor, postpartum blood transfusions, venous thromboembolisms, and intrauterine fetal growth restriction were more common in the bariatric surgery group. There were no differences observed in preterm births, fetal deaths, or reported congenital anomalies. Conclusion(s): In general, women who undergo bariatric surgery have improved pregnancy outcomes as compared with morbidly obese women. However, the bariatric surgery group was more likely to have venous thromboembolisms, to require a blood transfusion, to have their labor induced and to experience fetal growth restriction.

Database: EMBASE

42. A Time Interval of More Than 18 Months Between a Pregnancy and a Roux-en-Y Gastric Bypass Increases the Risk of Iron Deficiency and Anaemia in Pregnancy.

Author(s): Crusell, Mie; Nilas, Lisbeth; Svare, Jens; Lauenborg, Jeannet

Source: Obesity surgery; Oct 2016; vol. 26 (no. 10); p. 2457-2462

Publication Date: Oct 2016

Publication Type(s): Journal Article

PubMedID: 26983748

Abstract:OBJECTIVEThe aim of the study is to explore the impact of time between Roux-en-Y gastric bypass (RYGB) and pregnancy on obstetrical outcome and nutritional derangements.METHODSIn a retrospective cross-sectional study of pregnant women admitted for antenatal care at two tertiary hospitals, we examined 153 women with RYGB and a singleton pregnancy of at least 24 weeks. The women were stratified according to a pregnancy <18 months (40 women) or ≥18 months (113 women) after RYGB. Main outcome measures were nutritional parameters and glycated haemoglobin 1Ac (HbA1c) in second and third trimester of pregnancy, gestational hypertension, length of pregnancy, mode of delivery and foetal birth weight.RESULTSThe two groups were comparable regarding age, parity and prepregnancy body mass index. The frequency of iron deficiency anaemia (ferritin <12 μg/L and haemoglobin <6.5 mmol/L/10.5 g/dL) was significantly higher in the late group, 29 vs. 8 % in the early group, p = 0.010. No differences were found for vitamin B12, vitamin D and zinc. Median HbA1c was significantly higher in the late group than in the early group (33 vs. 31 mmol/mol, p = 0.027). There were no significant differences in the risk of adverse pregnancy outcome or birth weight between the two groups.CONCLUSIONA long surgery-to-pregnancy time interval after a RYGB increases the risk of iron deficiency anaemia but not of other nutritional deficits. Time interval does not seem to have an adverse effect on the obstetrical outcome, including intrauterine growth restriction. Specific attention is needed on iron deficit with increasing surgery-to-pregnancy time interval.

Database: Medline

43. Glucose Profiles in Pregnant Women After a Gastric Bypass : Findings from Continuous Glucose Monitoring.

Author(s): Bonis, Camille; Lorenzini, Françoise; Bertrand, Monelle; Parant, Olivier; Gourdy, Pierre; Vaurs, Charlotte; Cazals, Laurent; Ritz, Patrick; Hanaire, Hélène

Source: Obesity surgery; Sep 2016; vol. 26 (no. 9); p. 2150-2155

Publication Date: Sep 2016

Publication Type(s): Journal Article

PubMedID: 26757924

Abstract:BACKGROUNDThe diagnosis of gestational diabetes mellitus (GDM) usually requires an oral glucose tolerance test, but this procedure seems inappropriate after gastric bypass surgery (Roux-en-Y gastric bypass (RYGB)) due to specific altered glycemic responses. We aimed here at describing continuous glucose monitoring (CGM) profile of pregnant women after RYGB.METHODSCGM was performed in 35 consecutive pregnant women after RYGB at 26.2 ± 5 weeks of gestation.RESULTSAfter RYGB, pregnant women display high postprandial interstitial glucose (IG) peaks and low IG before and 2 h after meals. The postprandial IG peak is reached early, within 54 ± 9 min. The maximum IG values reach 205 mg/dl, and the percentage of time above 140 mg/dl (6.6 ± 7 %) is similar to what is described in GDM women.CONCLUSIONSThis study is the first to describe CGM profile in pregnant women after RYGB. CGM features are similar to those of non-pregnant post-RYGB patients, characterized by wide and rapid changes in postprandial IG, and high exposure to hyperglycemia. The exposure to hyperglycemia is similar to what is reported in GDM although the time to postprandial peak is shorter. CGM could be an additional useful approach to screen for glucose intolerance during pregnancy after RYGB.

Database: Medline

44. Adverse effects during the oral glucose tolerance test in post-bariatric surgery patients.

Author(s): Andrade, Heliana Fernanda de Albuquerque; Pedrosa, William; Diniz, Maria de Fátima Haueisen Sander; Passos, Valéria Maria Azeredo

Source: Archives of endocrinology and metabolism; Aug 2016; vol. 60 (no. 4); p. 307-313

Publication Date: Aug 2016

Publication Type(s): Journal Article

PubMedID: 26910630

Abstract:OBJECTIVEThe oral glucose tolerance test (OGTT) is used in the screening of gestational diabetes, in diagnosis of type 2 diabetes in conjunction with fasting blood glucose and glycated hemoglobin. The aim of this study was to examine the incidence and risk factors of adverse effects of OGTT in patients who underwent bariatric surgery, in addition to proposing standardization for ordering the OGTT in these patients.SUBJECTS AND METHODSThis study assessed the incidence of adverse effects in 128 post-bariatric surgery patients who underwent the OGTT. Descriptive and logistic regression analysis were performed, the dependent variables were defined as the presence of signs (tremor, profuse sweating, tachycardia), symptoms (nausea, diarrhea, dizziness, weakness), and hypoglycemia (blood glucose ≤ 50 mg/dL).RESULTSOne hundred and seventeen participants (91.4%) were female; 38 (29.7%) participants were pregnant. High incidence (64.8%) of adverse effects was observed: nausea (38.4%), dizziness (30.5%), weakness (25.8%), diarrhea (23.4%), hypoglycemia (14.8%), tachycardia (14.1%), tremor (13.3%), profuse sweating (12.5%) and one case of severe hypoglycemia (24 mg/dL). The presence of signs was associated with hypoglycemia (OR = 8.1, CI 95% 2.6-25.1). The arterial hypertension persisted as a risk factor for the incidence of signs (OR = 3.6, CI 95% 1.2-11.3). Fasting glucose below 75 mg/dL increased the risk of hypoglycemia during the test (OR = 9.5, CI 95% 2.6-35.1).CONCLUSIONIn this study, high incidence of adverse effects during the OGTT was observed in post-bariatric surgery patients. If these results are confirmed by further studies, the indication and regulation of the OGTT procedure must be reviewed for these patients.

Database: Medline

45. Pregnancy Management After Bariatric Surgery.

Author(s): Badreldin, Nevert; Kuller, Jeffrey; Rhee, Eleanor; Brown, Laura; Laifer, Steven

Source: Obstetrical & gynecological survey; Jun 2016; vol. 71 (no. 6); p. 361-368

Publication Date: Jun 2016

Publication Type(s): Journal Article Review

PubMedID: 27302187

Available at Obstetrical & gynecological survey - from Ovid (LWW Total Access Collection 2019 - with Neurology)

Abstract: Obesity is a source of major morbidity and mortality and is a growing concern worldwide. Maternal obesity is associated with increased maternal and fetal risks during pregnancy. Bariatric surgery has emerged as one of the most sustainable treatments for severe obesity and its comorbidities. Patients who have undergone bariatric surgery often experience drastic improvements in hypertension and diabetes. It is not surprising, therefore, that the incidence of bariatric surgery is increasing, particularly in women of childbearing age. In fact, many women undergoing bariatric surgery plan to become pregnant in the future. Bariatric surgery may have a beneficial effect on rates of fetal macrosomia, gestational diabetes, hypertension, and preeclampsia. Conversely, studies have showed that bariatric surgery may increase the risk of small for gestational age infants and preterm birth. Given its rising incidence, it is important that physicians be able to thoroughly and accurately counsel and treat patients who plan to, or do, become pregnant after bariatric surgery.

Database: Medline

46. Impact of bariatric surgery on fetal growth restriction: experience of a perinatal and bariatric surgery center.

Author(s): Chevrot, Audrey; Kayem, Gilles; Coupaye, Muriel; Lesage, Ninon; Msika, Simon; Mandelbrot, Laurent

Source: American journal of obstetrics and gynecology; May 2016; vol. 214 (no. 5); p. 655

Publication Date: May 2016

Publication Type(s): Journal Article

PubMedID: 26627725

Available at American journal of obstetrics and gynecology - from Unpaywall

Abstract:BACKGROUNDBariatric surgery is known to improve some pregnancy outcomes, but there is concern that it may increase the risk of small for gestational age.OBJECTIVETo assess the impact of bariatric surgery on pregnancy outcomes and specifically of the type of bariatric surgery on the risk of fetal growth restriction.STUDY DESIGNA single-center retrospective case-control study. The study group comprised all deliveries in women who had undergone bariatric surgery. To investigate the effects of weight loss on pregnancy outcomes, we compared the study group with a control group matched for presurgery body mass index. Secondly, to assess the specific impact of the type of surgery on the incidence of fetal growth restriction in utero, we distinguished subgroups with restrictive and malabsorptive bariatric surgery, and compared outcomes for each of these subgroups with a second control group, matched for prepregnancy body mass index.RESULTSAmong 139 patients operated, 58 had a malabsorptive procedure (gastric bypass) and 81 a purely restrictive procedure (72 a gastric banding and 9 a sleeve gastrectomy). Compared with controls matched for presurgery body mass index, the study group had a decreased rate of gestational diabetes (12% vs 23%, P = .02) and large for gestational age >90th percentile (11% vs 22%, P = .01) but an increased rate of small for gestational age <10th percentile. The incidence of small for gestational age was

higher after gastric bypass (29%) than it was after restrictive surgery (9%) or in controls matched for prepregnancy body mass index (6%) (P < .01 between bypass and controls). In multivariable analysis, after adjustment for other risk factors, gastric bypass remained strongly associated with small for gestational age (adjusted odds ratio, 7.16; 95% confidence interval, 2.74-18.72).CONCLUSIONMalabsorptive bariatric surgery was associated with an increased risk of fetal growth restriction.

Database: Medline

47. Bariatric Surgery and the Pregnancy Complicated by Gestational Diabetes

Author(s): Willis K.; Alexander C.; Sheiner E.

Source: Current Diabetes Reports; Apr 2016; vol. 16 (no. 4); p. 1-11

Publication Date: Apr 2016

Publication Type(s): Review

Available at Current Diabetes Reports - from SpringerLink - Medicine

Available at Current Diabetes Reports - from ProQuest (Health Research Premium) - NHS Version

Abstract: Gestational diabetes mellitus (GDM) is an increasingly common obstetrical problem. Due to the global escalation in the prevalence of obesity, as many as 15 % of pregnant women may soon be classified as having GDM. While often not diagnosed until late gestation, GDM is now recognized as a disorder of glucose and lipid metabolism, systemic inflammation, and insulin resistance that begins early in pregnancy. Recent large randomized trials have clarified the risk of maternal and neonatal complications caused by GDM, as well as the potential to ameliorate these risks. There is significant interest in the potential to reduce the risk for developing GDM in obese women through the performance of bariatric surgery (BS) before pregnancy. BS significantly reduces the risk for GDM, preeclampsia, and large neonates. However, it seems that the risk for small neonates and preterm delivery is increased. No significant differences are observed in regard to cesarean section, postpartum hemorrhage, or perinatal mortality. In this article, we address the effects of GDM on the mother and child, and explore the risks and benefits of BS in the obstetrical population.

Database: EMBASE

48. Pregnancy After Bariatric Surgery.

Author(s): Monson, Martha; Jackson, Marc

Source: Clinical obstetrics and gynecology; Mar 2016; vol. 59 (no. 1); p. 158-171

Publication Date: Mar 2016

Publication Type(s): Journal Article Review

PubMedID: 26710306

Available at Clinical obstetrics and gynecology - from Ovid (LWW Total Access Collection 2019 - with Neurology)

Abstract: Bariatric surgery is the most effective weight loss treatment available for morbidly obese patients. The majority of bariatric surgery cases are now performed on reproductive-aged women. The pregnant bariatric surgery patient is unique, with specific care needs that often require a multidisciplinary approach. Here, we will review the rationale for bariatric surgery and contemporary surgical modalities. We will then consider the obstetric and neonatal implications following these procedures and discuss the tenets of pregnancy care in the patient after bariatric surgery.

Database: Medline

49. Vitamin D and its relation with ionic calcium, parathyroid hormone, maternal and neonatal characteristics in pregnancy after roux-en-Y gastric bypass.

Author(s): Medeiros, Marina; Matos, Andréa C; Pereira, Silvia E; Saboya, Carlos; Ramalho, Andréa

Source: Archives of gynecology and obstetrics; Mar 2016; vol. 293 (no. 3); p. 539-547

Publication Date: Mar 2016

Publication Type(s): Journal Article

PubMedID: 26315471

Available at Archives of gynecology and obstetrics - from SpringerLink - Medicine

Abstract:PURPOSEThe objective of this study was to evaluate vitamin D nutritional status and its relation with ionic calcium, parathyroid hormone (PTH), maternal anthropometry and perinatal outcomes in pregnant women who previously underwent Roux-en-Y gastric bypass (RYGB) surgery.METHODSIn a clinic specialized in obesity control located in the city of Rio de Janeiro (Brazil), the following information were collected for adult women who underwent RYGB before pregnancy: serum concentrations of vitamin D [25(OH)D], calcium and PTH per gestational trimester and data on maternal anthropometry, gestational intercurrences and perinatal outcomes.RESULTSThe present study included 46 post-RYGB pregnant women. The prevalence of pregnant women with deficiency (≤20 ng/mL) or insufficiency (≥21 and 29 ng/mL) of vitamin D was above 70% in all trimesters. The prevalence of calcium deficiency was 15.2% in the first and in the second trimesters and 20% in the third trimester, while the prevalence of excess PTH was 19.6, 30.4 and 32.6% in the first, the second and the third trimesters, respectively. In the second and the third trimesters, a significant difference was observed between concentrations of 25(OH)D, and a negative correlation was observed between concentrations of calcium and PTH. Association of 25(OH)D with urinary tract infection (UTI) was found, but there was no association with calcium, PTH, maternal anthropometry, type of delivery and weight and gestational age at birthCONCLUSIONSThe post-RYGB pregnant women showed an elevated serum inadequacy (deficiency or insufficiency) of 25(OH)D during pregnancy. Maternal vitamin D status showed no association with maternal variables, except UTI, and the neonatal variables analyzed.

Database: Medline

50. A meta-analysis of maternal and fetal outcomes of pregnancy after bariatric surgery.

Author(s): Yi, Xiao-yan; Li, Qi-fu; Zhang, Jun; Wang, Zhi-hong

Source: International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics; Jul 2015; vol. 130 (no. 1); p. 3-9

Publication Date: Jul 2015

Publication Type(s): Research Support, Non-u.s. Gov't Meta-analysis Journal Article Review

PubMedID: 25863541

Available at International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics - from Wiley Online Library

Abstract:BACKGROUNDThe effects of bariatric surgery (BS) on outcomes in subsequent pregnancies are unclear.OBJECTIVESTo compare maternal and fetal outcomes among women who become pregnant after BS and obese women who have not undergone BS before pregnancy.SEARCH STRATEGYPubMed and Embase were searched for relevant reports, and the reference lists of identified articles were hand-searched.SELECTION CRITERIACohort studies that compared outcomes among women who had undergone any type of BS and obese women who had not undergone surgery were included when results were reported as risk ratios or odds ratios (ORs).DATA COLLECTION AND ANALYSISSummary ORs were estimated using a random effects model.MAIN RESULTSEleven studies were included. Compared with obese women who had not undergone BS, women who had undergone BS had significantly lower odds of gestational diabetes (OR 0.31; 95% CI 0.15-0.65), hypertensive disorders (OR 0.42; 95% CI 0.23-0.78), and macrosomia (OR 0.40; 95% CI 0.24-0.67). However, their odds of small-for-gestational-age newborns were increased (OR 2.16; 95% CI 1.28-3.66). No significant differences were recorded for cesarean, postpartum hemorrhage, and preterm delivery.CONCLUSIONSBS reduces the odds of some adverse maternal and fetal outcomes among obese women.

Database: Medline

51. Maternal micronutrient deficiencies and related adverse neonatal outcomes after bariatric surgery: a systematic review

Author(s): Jans G.; Matthys C.; Van der Schueren B.; Bogaerts A.; Lannoo M.; Verhaeghe J.; Devlieger R.

Source: Advances in nutrition (Bethesda, Md.); Jul 2015; vol. 6 (no. 4); p. 420-429

Publication Date: Jul 2015

Publication Type(s): Review

PubMedID: 26178026

Available at Advances in nutrition (Bethesda, Md.) - from Europe PubMed Central - Open Access

Available at Advances in nutrition (Bethesda, Md.) - from HighWire - Free Full Text

Available at Advances in nutrition (Bethesda, Md.) - from Unpaywall

Abstract: Pregnant and postpartum women with a history of bariatric surgery are at risk of micronutrient deficiencies as a result of the combination of physiologic changes related to pregnancy and iatrogenic postoperative alterations in the absorption and metabolism of crucial nutrients. This systematic review investigates micronutrient deficiencies and related adverse clinical outcomes in pregnant and postpartum women after bariatric surgery. A systematic approach involving critical appraisal was conducted independently by 2 researchers to examine deficiencies of phylloquinone, folate, iron, calcium, zinc, magnesium, iodide, copper, and vitamins A, D, and B-12 in pregnant and postpartum women after bariatric surgery, together with subsequent outcomes in the

neonates. The search identified 29 relevant cases and 8 cohort studies. The quality of reporting among the case reports was weak according to the criteria based on the CARE (CAse REporting) guidelines as was that for the cohort studies based on the criteria from the Cohort Study Quality Assessment list of the Dutch Cochrane Center. The most common adverse neonatal outcomes related to maternal micronutrient deficiencies include visual complications (vitamin A), intracranial hemorrhage (phylloquinone), neurological and developmental impairment (vitamin B-12), and neural tube defects (folate). On the basis of the systematically collected information, we conclude that the evidence on micronutrient deficiencies in pregnant and postpartum women after bariatric surgery and subsequent adverse neonatal outcomes remains weak and inconclusive.

Database: EMBASE

52. Maternal and neonatal outcomes for pregnancies before and after gastric bypass surgery.

Author(s): Adams, T D; Hammoud, A O; Davidson, L E; Laferrère, B; Fraser, A; Stanford, J B; Hashibe, M; Greenwood, J L J; Kim, J; Taylor, D; Watson, A J; Smith, K R; McKinlay, R; Simper, S C; Smith, S C; Hunt, S C

Source: International journal of obesity (2005); Apr 2015; vol. 39 (no. 4); p. 686-694

Publication Date: Apr 2015

Publication Type(s): Research Support, Non-u.s. Gov't Research Support, N.i.h., Extramural Journal Article

PubMedID: 25644056

Abstract:BACKGROUNDInteraction between maternal obesity, intrauterine environment and adverse clinical outcomes of newborns has been described.METHODSUsing statewide birth certificate data, this retrospective, matched-control cohort study compared paired birth weights and complications of infants born to women before and after Roux-en-Y gastric bypass surgery (RYGB) and to matched obese non-operated women in several different groups. Women who had given birth to a child before and after RYGB (group 1; n=295 matches) and women with pregnancies after RYGB (group 2; n=764 matches) were matched to non-operated women based on age, body mass index (BMI) prior to both pregnancy and RYGB, mother's race, year of mother/s birth, date of infant births and birth order. In addition, birth weights of 13 143 live births before and/or after RYGB of their mothers (n=5819) were compared (group 3).RESULTSOdds ratios (ORs) for having a large-for-gestational-age (LGA) neonate were significantly less after RYGB than for non-surgical mothers: ORs for groups 1 and 2 were 0.19 (0.08-0.38) and 0.33 (0.21-0.51), respectively. In contrast, ORs in all three groups for risk of having a small for gestational age (SGA) neonate were greater for RYGB mothers compared to non-surgical mothers (ORs were 2.16 (1.00-5.04); 2.16 (1.43-3.32); and 2.25 (1.89-2.69), respectively). Neonatal complications were not different for group 1 RYGB and non-surgical women for the first pregnancy following RYGB. Pregnancy-induced hypertension and gestational diabetes were significantly lower for the first pregnancy of mothers following RYGB compared to matched pregnancies of non-surgical mothers.CONCLUSIONWomen who had undergone RYGB not only had lower risk for having an LGA neonate compared to BMI-matched mothers, but also had significantly higher risk for delivering an SGA neonate following RYGB. RYGB women were less likely than non-operated women to have pregnancy-related hypertension and diabetes.

Database: Medline

53. Outcomes of pregnancy after bariatric surgery.

Author(s): Johansson, Kari; Cnattingius, Sven; Näslund, Ingmar; Roos, Nathalie; Trolle Lagerros, Ylva; Granath, Fredrik; Stephansson, Olof; Neovius, Martin

Source: The New England journal of medicine; Feb 2015; vol. 372 (no. 9); p. 814-824

Publication Date: Feb 2015

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

PubMedID: 25714159

Abstract:BACKGROUNDMaternal obesity is associated with increased risks of gestational diabetes, large-for-gestational-age infants, preterm birth, congenital malformations, and stillbirth. The risks of these outcomes among women who have undergone bariatric surgery are unclear.METHODSWe identified 627,693 singleton pregnancies in the Swedish Medical Birth Register from 2006 through 2011, of which 670 occurred in women who had previously undergone bariatric surgery and for whom presurgery weight was documented. For each pregnancy after bariatric surgery, up to five control pregnancies were matched for the mother's presurgery body-mass index (BMI; we used early-pregnancy BMI in the controls), age, parity, smoking history, educational level, and delivery year. We assessed the risks of gestational diabetes, large-for-gestational-age and small-for-gestational-age infants, preterm birth, stillbirth, neonatal death, and major congenital malformations.RESULTSPregnancies after bariatric surgery, as compared with matched control pregnancies, were associated with lower risks of gestational diabetes (1.9% vs. 6.8%; odds ratio, 0.25; 95% confidence interval [CI], 0.13 to 0.47; P<0.001) and large-for-gestational-age infants (8.6% vs. 22.4%; odds ratio, 0.33; 95% CI, 0.24 to 0.44; P<0.001). In contrast, they were associated with a higher risk of small-for-gestational-age infants (15.6% vs. 7.6%; odds ratio, 2.20; 95% CI, 1.64 to 2.95; P<0.001) and shorter gestation (273.0 vs. 277.5 days; mean difference -4.5 days; 95% CI, -2.9 to -6.0; P<0.001), although the risk of preterm birth was not significantly different (10.0% vs. 7.5%; odds ratio, 1.28; 95% CI, 0.92 to 1.78; P=0.15). The risk of stillbirth or neonatal death was 1.7% versus 0.7% (odds ratio, 2.39; 95% CI, 0.98 to 5.85; P=0.06). There was no significant between-group difference in the frequency of congenital malformations.CONCLUSIONSBariatric surgery was associated with reduced risks of gestational diabetes and excessive fetal growth, shorter gestation, an increased risk of small-for-gestational-age infants, and possibly increased mortality. (Funded by the Swedish Research Council and others.).

Database: Medline

54. Fetal growth in pregnancies conceived after gastric bypass surgery in relation to surgery-to-conception interval: a Danish national cohort study.

Author(s): Nørgaard, Lone Nikoline; Gjerris, Anne Cathrine Roslev; Kirkegaard, Ida; Berlac, Janne Foss; Tabor, Ann; Danish Fetal Medicine Research Group

Source: PloS one; 2014; vol. 9 (no. 3); p. e90317

Publication Date: 2014

Publication Type(s): Journal Article

PubMedID: 24658186

Abstract:OBJECTIVETo describe early and late fetal growth in pregnancies conceived after gastric bypass surgery in relation to time from surgery to conception of pregnancy.METHODSNational cohort study on 387 Danish women, who had laparoscopic or open gastric bypass surgery prior to a singleton pregnancy in which first trimester screening was performed between January 2008 and June 2011. Data were derived from national registers (Danish National Registry of Patients and Danish National Birth Registry, Pregnancy Complications and Abortion-clinical quality database (PreCAb) and the Danish Fetal Medicine Database). Main outcome measures were early and late fetal growth in relation to time from bariatric surgery to conception of the pregnancy. Early fetal growth was expressed as "Fetal Growth Index": the ratio between the estimated number of days from first trimester ultrasound to second trimester ultrasound biometries and the actual calender time elapsed in days. Late fetal growth was expressed as the observed versus expected birthweight according to gestational age (GA).RESULTSThe surgery-to-conception interval ranged from 3 to 1851 days with a mean value of 502 (SD, 351) days. The mean "fetal growth index" was 0.99 (SD, 0.02) days/day and thus significantly lower than in the background population (mean, 1.04 (SD, 0.09) days/day, $p<0.0001$). The proportion of infants being small for gestational age was 18.8% and the proportion of large for gestational age infants was 6.7%. The correlation coefficients between surgery-to-conception time and "fetal growth index" and birthweight according to GA were 0.01 ($p=0.8$) and 0.04 ($p=0.4$), respectively.CONCLUSIONFetal growth index was lower than reported in the background population. No correlation was found between the surgery-to-conception interval and early or late fetal growth in pregnancies conceived after gastric bypass surgery.

Database: Medline

55. Micronutrient levels and supplement intake in pregnancy after bariatric surgery: a prospective cohort study.

Author(s): Devlieger, Roland; Guelinckx, Isabelle; Jans, Goele; Voets, Willy; Vanholsbeke, Caroline; Vansant, Greet

Source: PloS one; 2014; vol. 9 (no. 12); p. e114192

Publication Date: 2014

Publication Type(s): Research Support, Non-u.s. Gov't Multicenter Study Journal Article

PubMedID: 25470614

Available at PloS one - from Europe PubMed Central - Open Access

Available at PloS one - from ProQuest (Health Research Premium) - NHS Version

Available at PloS one - from Unpaywall

Abstract:BACKGROUNDStudies report frequent micronutrient deficiencies after bariatric surgery, but less is known about micronutrient levels of pregnant women after bariatric surgery.OBJECTIVETo prospectively evaluate micronutrient levels and supplement intake in pregnancy following bariatric surgery.DESIGNA multicenter prospective cohort study including women with restrictive or malabsorptive types of bariatric surgery. Nutritional deficiencies, together with supplement intake, were screened during pregnancy.RESULTSThe total population included 18 women in the restrictive and 31 in the malabsorptive group. Most micronutrients were depleted and declined significantly during pregnancy. The proportion of women with low vitamin A and B-1 levels increased to respectively 58 and 17% at delivery (P = 0.005 and 0.002). The proportion of women with vitamin D deficiency decreased from 14% at trimester 1 to 6% at delivery (P = 0.030). Mild anemia was found in respectively 22 and 40% of the women at trimester 1 and delivery. In the first trimester, most women took a multivitamin (57.1%). In the second and third trimester, the majority took additional supplements (69.4 and 73.5%). No associations were found between supplement intake and micronutrient deficiencies.CONCLUSIONPregnant women with bariatric surgery show frequent low micronutrient levels. Supplementation partially normalizes low levels of micronutrients.

Database: Medline

56. Maternal and neonatal outcomes in women undergoing bariatric surgery: a systematic review and meta-analysis.

Author(s): Galazis, Nicolas; Docheva, Nikolina; Simillis, Constantinos; Nicolaides, Kypros H

Source: European journal of obstetrics, gynecology, and reproductive biology; Oct 2014; vol. 181 ; p. 45-53

Publication Date: Oct 2014

Publication Type(s): Meta-analysis Journal Article Review Systematic Review

PubMedID: 25126981

Abstract:BACKGROUNDObese women are at increased risk for many pregnancy complications, and bariatric surgery (BS) before pregnancy has shown to improve some of these.OBJECTIVESTo review the current literature and quantitatively assess the obstetric and neonatal outcomes in pregnant women who have undergone BS.SEARCH STRATEGYMEDLINE, EMBASE and Cochrane databases were searched using relevant keywords to identify studies that reported on pregnancy outcomes after BS.SELECTION CRITERIAPregnancy outcome in firstly, women after BS compared to obese or BMI-matched women with no BS and secondly, women after BS compared to the same or different women before BS. Only observational studies were included.DATA COLLECTION AND ANALYSISTwo investigators independently collected data on study characteristics and outcome measures of interest. These were analysed using the random effects model. Heterogeneity was assessed and

sensitivity analysis was performed to account for publication bias.MAIN RESULTSThe entry criteria were fulfilled by 17 non-randomised cohort or case-control studies, including seven with high methodological quality scores. In the BS group, compared to controls, there was a lower incidence of preeclampsia (OR 0.45, 95% CI 0.25-0.80; P=0.007), GDM (OR 0.47, 95% CI 0.40-0.56; P<0.001) and large neonates (OR 0.46, 95% CI 0.34-0.62; P<0.001) and a higher incidence of small neonates (OR 1.93, 95% CI 1.52-2.44; P<0.001), preterm birth (OR 1.31, 95% CI 1.08-1.58; P=0.006), admission for neonatal intensive care (OR 1.33, 95% CI 1.02-1.72; P=0.03) and maternal anaemia (OR 3.41, 95% CI 1.56-7.44, P=0.002).CONCLUSIONSBS as a whole improves some pregnancy outcomes. Laparoscopic adjustable gastric banding does not appear to increase the rate of small neonates that was seen with other BS procedures. Obese women of childbearing age undergoing BS need to be aware of these outcomes.

Database: Medline

57. Laboratory testing for and diagnosis of nutritional deficiencies in pregnancy before and after bariatric surgery.

Author(s): Gadgil, Meghana D; Chang, Hsien-Yen; Richards, Thomas M; Gudzune, Kimberly A; Huizinga, Mary M; Clark, Jeanne M; Bennett, Wendy L

Source: Journal of women's health (2002); Feb 2014; vol. 23 (no. 2); p. 129-137

Publication Date: Feb 2014

Publication Type(s): Research Support, Non-u.s. Gov't Research Support, N.i.h., Extramural Journal Article

PubMedID: 24102519

Available at Journal of women's health (2002) - from EBSCO (Psychology and Behavioral Sciences Collection)

Available at Journal of women's health (2002) - from Unpaywall

Abstract:OBJECTIVEBariatric surgery can reduce the risk of obesity-related complications of pregnancy, but may cause essential nutrient deficiencies. To assess adherence to laboratory testing guidelines, we examined frequency of testing for and diagnosis of deficiency during preconception and pregnancy using claims data in women with a delivery and bariatric surgery.METHODSRetrospective analysis of claims from seven Blue Cross/Blue Shield plans between 2002 and 2008. We included women with a delivery and bariatric surgery within the study period. We used common procedural terminology (CPT) and ICD-9 codes to define laboratory testing and deficiencies for iron, folate, vitamin B12, vitamin D, and thiamine. Using Student's t-test and chi-square testing, we compared frequency of laboratory tests and diagnoses during 12 months preconception and 280 days of pregnancy between women with pregnancy before versus after surgery. We used multivariate logistic regression to evaluate for predictors of laboratory testing.RESULTSWe identified 456 women with pregnancy after bariatric surgery and 338 before surgery. The frequency of testing for any deficiency was low (9%-51%), but higher in those with pregnancy after surgery (p<0.003). The most common deficiency was vitamin B12 (12%-13%) with pregnancy after surgery (p<0.006). Anemia and number of health provider visits were independent predictors of laboratory testing.CONCLUSIONWomen with pregnancy after bariatric surgery were tested for and diagnosed with micronutrient deficiencies more frequently than those with pregnancy before surgery. However, most laboratory testing occurred in less than half the women and was triggered by anemia. Increased testing may help identify nutrient deficiencies and prevent consequences for maternal and child health.

Database: Medline

58. Perinatal outcomes after bariatric surgery: nationwide population based matched cohort study.

Author(s): Roos, Nathalie; Neovius, Martin; Cnattingius, Sven; Trolle Lagerros, Ylva; Sääf, Maria; Granath, Fredrik; Stephansson, Olof

Source: BMJ (Clinical research ed.); Nov 2013; vol. 347 ; p. f6460

Publication Date: Nov 2013

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article

PubMedID: 24222480

Abstract:OBJECTIVETo compare perinatal outcomes in births of women with versus without a history of bariatric surgery.DESIGNPopulation based matched cohort study.SETTINGSwedish national health service.PARTICIPANTS1,742,702 singleton births identified in the Swedish medical birth register between 1992 and 2009. For each birth to a mother with a history of bariatric surgery (n=2562), up to five control births were matched by maternal age, parity, early pregnancy body mass index, early pregnancy smoking status, educational level, and year of delivery. Secondary control cohorts, including women eligible for bariatric surgery (body mass index ≥ 35 or ≥ 40), were matched for the same factors except body mass index. History of maternal bariatric surgery was ascertained through the Swedish national patient register from 1980 to 2009.MAIN OUTCOME MEASURESPreterm birth (<37 weeks), small for gestational age birth, large for gestational age birth, stillbirth (≥ 28 weeks), and neonatal death (0-27 days).RESULTSPost-surgery births were more often preterm than in matched controls (9.7% (243/2511) v 6.1% (750/12,379); odds ratio 1.7, 95% confidence interval 1.4 to 2.0; P<0.001). Body mass index seemed to be an effect modifier (P=0.01), and the increased risk of preterm birth was only observed in women with a body mass index <35. A history of bariatric surgery was associated with increased risks of both spontaneous (5.2% (130/2511) v 3.6% (441/12,379); odds ratio 1.5, 1.2 to 1.9; P<0.001) and medically indicated preterm birth (4.5% (113/2511) v 2.5% (309/12,379); odds ratio 1.8, 1.4 to 2.3; P<0.001). A history of bariatric surgery was also associated with an increased risk of a small for gestational age birth (5.2% (131/2507) v 3.0% (369/12,338); odds ratio 2.0, 1.5 to 2.5; P<0.001) and lower risk of a large for gestational age birth (4.2% (105/2507) v 7.3% (895/12,338); odds ratio 0.6, 0.4 to 0.7; P<0.001). No differences were detected for stillbirth or neonatal death. The increased risks for preterm and small for gestational age birth, as well as the decreased risk for large for gestational age birth, remained when post-surgery births were compared with births of women eligible for bariatric surgery.CONCLUSIONWomen with a history of bariatric surgery were at increased risk of preterm and small for gestational age births and should be regarded as a risk group during pregnancy.

Database: Medline

59. Vitamin D deficiency in pregnancy after bariatric surgery.

Author(s): Medeiros, Marina; Saunders, Cláudia; Chagas, Cristiane B; Pereira, Silvia E; Saboya, Carlos; Ramalho, Andréa

Source: Obesity surgery; Oct 2013; vol. 23 (no. 10); p. 1679-1684

Publication Date: Oct 2013

Publication Type(s): Journal Article Review

PubMedID: 23943547

Available at Obesity surgery - from SpringerLink - Medicine

Available at Obesity surgery - from ProQuest (Health Research Premium) - NHS Version

Abstract: The objective of this study was to describe the main factors related to the installation and/or aggravation of vitamin D deficiency (VDD) and its clinical consequences in pregnant women after bariatric surgery. An electronic search on VDD in pregnancy and after bariatric surgery was conducted in publications from 1998 until 2012 that presented studies performed in humans. We provided an overview of VDD after bariatric surgery, in pregnancy, and in pregnancy in women who underwent bariatric surgery. In view of the high percentage of VDD postoperatively and the role of this vitamin in pregnancy, we recommend the investigation of vitamin D nutritional status in prenatal care.

Database: Medline

60. The risk of adverse pregnancy outcome after bariatric surgery: A nationwide register-based matched cohort study

Author(s): Kjaer M.M.; Lauenborg J.; Breum B.M.; Nilas L.

Source: American Journal of Obstetrics and Gynecology; Jun 2013; vol. 208 (no. 6); p. 464

Publication Date: Jun 2013

Publication Type(s): Article

PubMedID: 23467053

Abstract: Objective: The aim of this study was to describe the risk of adverse obstetric and neonatal outcome after bariatric surgery. Study Design: Nationwide register-based matched cohort study of singleton deliveries after bariatric surgery during 2004-2010. Data were extracted from The Danish National Patient Registry and The Medical Birth Register. Each woman with bariatric surgery (exposed) was individually matched with 4 women without bariatric surgery (unexposed) on body mass index, age, parity, and date of delivery. Continuous variables were analyzed with the paired t test and binary outcomes were analyzed by logistic regression. Result(s): We identified 339 women with a singleton delivery after bariatric surgery (84.4% gastric bypass). They were matched to 1277 unexposed women. Infants in the exposed group had shorter mean gestational age (274 vs 278 days; P <.001), lower mean birthweight (3312 vs 3585 g; P <.001), lower risk of being large for gestational age (adjusted odds ratio, 0.31; 95% confidence interval, 0.15-0.65), and higher risk of being small for gestational age (SGA) (adjusted odds ratio, 2.29; 95% confidence interval, 1.32-3.96) compared with infants in the unexposed group. No statistically significant difference was found between the groups regarding the risk of gestational diabetes mellitus, preeclampsia, labor induction, cesarean section, postpartum hemorrhage, Apgar score less than 7, admission to neonatal intensive care unit or perinatal death. Conclusion(s): Infants born after maternal bariatric surgery have lower birthweight, lower gestational age, 3.3-times lower risk of large for gestational age, and 2.3-times higher risk of SGA than infants born by a matched group of women without bariatric surgery. The impact on SGA was even higher in the subgroup with gastric bypass. © 2013 Mosby, Inc.

Database: EMBASE

61. Pregnancy after bariatric surgery--a review of benefits and risks.

Author(s): Kjaer, Mette Mandrup; Nilas, Lisbeth

Source: Acta obstetricia et gynecologica Scandinavica; Mar 2013; vol. 92 (no. 3); p. 264-271

Publication Date: Mar 2013

Publication Type(s): Journal Article Review

PubMedID: 23066836

Abstract:BACKGROUNDWhen other weight loss attempts have failed, bariatric surgery offers a successful alternative for obesity. Since operations are performed during women's reproductive years, the number of pregnant women with prior bariatric surgery is increasing. Bariatric surgery results in restriction of food intake and/or malabsorption leading to weight loss, but may induce a risk for malnutrition and pregnancy complications.METHODSystematically conducted review addressing pregnancy after bariatric surgery using the PubMed and Cochrane databases.MAIN OUTCOME MEASURESBirthweight, gestational age, birth defects, preeclampsia, gestational diabetes mellitus, and mode of delivery.RESULTSWe included 17 articles in English, comparing pregnancies in women with prior bariatric surgery to pregnancies in a control group without this. There was considerable heterogeneity in study design and six of the studies included <50 women with bariatric surgery. Eight studies described lower birthweight and lower risk of macrosomia after bariatric surgery, but in six there was no difference. Five studies indicated a higher risk of small-for-gestational age infants, but only compared with non-obese women or severely obese controls. There was no difference in gestational length. Only one study suggested a higher risk of birth defects after surgery. The maternal risk of preeclampsia and gestational diabetes mellitus was lower after bariatric surgery. Results regarding mode of delivery are conflicting.CONCLUSIONPregnancy after bariatric surgery seems safe but larger studies matching or adjusting for body mass index are needed to improve the surveillance of these pregnancies and to assist in preventing adverse outcomes.

Database: Medline

62. Bariatric surgery: Impact on pregnancy outcomes

Author(s): Sheiner E.; Willis K.; Yogev Y.

Source: Current Diabetes Reports; Feb 2013; vol. 13 (no. 1); p. 19-26

Publication Date: Feb 2013

Publication Type(s): Article

PubMedID: 23065365

Available at Current Diabetes Reports - from SpringerLink - Medicine

Available at Current Diabetes Reports - from ProQuest (Health Research Premium) - NHS Version

Abstract: The dramatic increase in the prevalence of obesity in women of reproductive age has resulted in approximately 1 in 5 women being obese when they conceive. Bariatric surgery has been shown to be the most effective long-term weight loss strategy in obese women in this age group. Clinicians should be aware of the effects of bariatric surgery on fertility and future pregnancies. Regarding certain complications, pregnancy after bariatric surgery appears to be safer than pregnancy in the obese. In patients where nutrition is properly maintained and monitored, the risks for obesity-related obstetric complications, such as gestational diabetes mellitus and hypertension, are significantly reduced, but possibly at the expense of an increase in neonates born small-for-gestational- age. At the present, definitive conclusions cannot be drawn concerning the risk for Caesarian delivery, differences in type of bariatric procedure, or the optimal surgery-to-conception interval. © 2012 Springer Science+Business Media New York.

Database: EMBASE

63. Reproductive concerns and pregnancy after bariatric surgery: Practice implications

Author(s): Lazear J.; Bode C.; Zimberg P.; Lintner N.C.

Source: Bariatric Nursing and Surgical Patient Care; Jun 2012; vol. 7 (no. 2); p. 75-82

Publication Date: Jun 2012

Publication Type(s): Review

Abstract: Approximately 113,000 bariatric procedures are conducted yearly. From 1998 to 2005, 83% of those having bariatric surgery in the 18 to 45-year-old age group were women. Reproductive implications are ideally addressed when surgery is planned, including the possibility of increased fertility after surgery, appropriate contraception, and the interval from surgery to pregnancy. Maternal and neonatal outcomes post bariatric surgery have generally been found to be positive and are often improved over those seen in obese women without a history of bariatric procedures. However, surgical complications have been reported, as well as nutritional deficits. Some studies have suggested an increase in small for gestational age (SGA) newborns and increased cesarean section rates, while others have not found these relationships. Neonatal complications have also been reported. Pregnancy care for women with a history of bariatric surgery includes screening for and managing nutritional deficits, careful assessment to rule out surgical complications, and attention to psychosocial needs. The aim of this article is to review findings of studies that examined the impact of bariatric procedures on fertility, contraception, pregnancy, and maternal and neonatal outcomes. In addition, the resulting implications for practice for all members of the healthcare team caring for women with a history of bariatric surgery, who are or may become pregnant, will be discussed. © Mary Ann Liebert, Inc.

Database: EMBASE

64. Impact of prior bariatric surgery on maternal and fetal outcomes among obese and non-obese mothers.

Author(s): Belogolovkin, Victoria; Salihu, Hamisu M; Weldeselasse, Hanna; Biroscak, Brian J; August, Euna M; Mbah, Alfred K; Alio, Amina P

Source: Archives of gynecology and obstetrics; May 2012; vol. 285 (no. 5); p. 1211-1218

Publication Date: May 2012

Publication Type(s): Journal Article

PubMedID: 22057892

Abstract:PURPOSETo assess the association between bariatric surgery and pregnancy-related outcomes among obese and non-obese women in the state of Florida.METHODSWe conducted a population-based, retrospective cohort analysis using vital records and hospital discharge data in Florida during 2004-2007. Women were categorized based on prior bariatric surgery and pre-pregnancy obesity status. Maternal complications (i.e., anemia, pre-eclampsia, gestational diabetes, chronic hypertension, endocrine disorders, cesarean section, prolonged hospital stay) and fetal morbidities [macrosomia, preterm birth, small for gestational age (SGA)] were the outcomes of interest. Adjusted odds ratios (AOR) and 95% confidence intervals (CI) were computed.RESULTSMothers with a prior history of bariatric surgery, regardless of obesity status, were more likely to have anemia, chronic hypertension, endocrine disorders, and SGA infants. Classification based on prior history of bariatric surgery and obesity status showed that non-obese mothers with prior bariatric surgery were more likely to have anemia, chronic hypertension, endocrine disorders, and SGA infants, whereas obese mothers without prior bariatric surgery were at greater risk of having gestational diabetes, chronic hypertension, macrosomic infants (AOR = 1.69, 95% CI = 1.65-1.73), and prolonged hospital stay as compared to non-obese mother without prior bariatric surgery.CONCLUSIONSAlthough prior bariatric surgery is associated with multiple negative maternal and fetal outcomes, it is protective against infant macrosomia in obese mothers. Our findings support the need for preconception/interconception services tailored for former bariatric surgery patients to improve maternal and feto-infant health outcomes.

Database: Medline

65. Pregnancy outcomes in women after bariatric surgery compared with obese and morbidly obese controls.

Author(s): Lesko, Jennifer; Peaceman, Alan

Source: Obstetrics and gynecology; Mar 2012; vol. 119 (no. 3); p. 547-554

Publication Date: Mar 2012

Publication Type(s): Journal Article

PubMedID: 22353952

Abstract:OBJECTIVETo estimate the rates of pregnancy outcomes of women after bariatric surgery relative to women in a control groups.METHODSThe study was a chart review. Presurgery and prepregnancy body mass index (BMI) were calculated for 70 patients who had undergone bariatric surgery and who had a subsequent singleton pregnancy. Four control patients were then randomly selected for each case patient: two with a BMI within 6 points of the average presurgery BMI and two with a BMI within 6 points of the average prepregnancy BMI. The primary outcomes were the rates of gestational diabetes or hypertensive disorders of pregnancy.RESULTSThere was a significant decrease in rate of gestational diabetes in bariatric surgery patients (0.0%) as compared with both control groups (morbidly obese 16.4%, obese 9.3%; corrected odds ratio (OR)morbidly obese 0.04, with a 95% confidence interval [CI] 0.00-0.62, P<.01; corrected OR obese 0.07, CI 0.00-1.20, P=.01). There was no significant difference in the rate of hypertensive disorders of pregnancy with bariatric surgery. Additionally, neonates were significantly more likely to be small for gestational age (SGA) in the bariatric surgery group (17.4%) than the morbidly obese group (5.0%) (OR 3.94, CI 1.47-10.53, P<.01).CONCLUSIONBariatric surgery is associated with reduction in gestational diabetes in a subsequent pregnancy, but possibly at the expense of an increase in SGA neonates.

Database: Medline

66. Pregnancy after bariatric surgery: a current view of maternal, obstetrical and perinatal challenges.

Author(s): Magdaleno, Ronis; Pereira, Belmiro Gonçalves; Chaim, Elinton Adami; Turato, Egberto Ribeiro

Source: Archives of gynecology and obstetrics; Mar 2012; vol. 285 (no. 3); p. 559-566

Publication Date: Mar 2012

Publication Type(s): Journal Article Review

PubMedID: 22205187

Available at Archives of gynecology and obstetrics - from SpringerLink - Medicine

Abstract:UNLABELLEDWith the increase in the number of bariatric surgeries being performed in women of childbearing age, physicians must have concerns regarding the safety of pregnancy after bariatric surgery. The aim of this review is to summarize the literature reporting on maternal, obstetrical and perinatal implications of pregnancy following BS.METHODSEnglish, Spanish and Portuguese-language articles were identified in a PUBMED search from 2005 to February 2011 using the keywords for pregnancy and bariatric surgery or gastric bypass or gastric banding.RESULTSThe studies show improved fertility and a reduced risk of gestational diabetes, pregnancy-induced hypertension and pre-eclampsia, macrosomia in pregnant women after bariatric surgery. The incidence of intrauterine growth restriction and small for gestational age are increased. No conclusions can be drawn concerning the risk for cesarean delivery and the best surgery-to-conception interval. Deficiencies in iron, vitamin A, vitamin B12, vitamin K, folate and calcium can result in maternal and fetal complications.CONCLUSIONSPregnancy outcome of women who delivered after BS, as compared to obese populations, is better and safer and comparable to the general population. Close supervision before, during and after pregnancy following bariatric surgery and nutrient supplementation adapted to the patient's individual requirements can prevent nutrition-related complications and improve maternal and fetal health.

Database: Medline

67. Intrauterine growth restriction after bariatric surgery

Author(s): Belcastro M.R.; Neiger R.; Ventolini G.

Source: Journal of Neonatal-Perinatal Medicine; 2011; vol. 4 (no. 3); p. 231-234

Publication Date: 2011

Publication Type(s): Article

Abstract: Objective: Studies have suggested that pregnancies in patients with gastric bypass surgery for obesity are uncomplicated if the procedure was performed 6 to 18 months before pregnancy. We aim to examine intrauterine growth restriction (IUGR) in patients who underwent gastric bypass for at least 18 months before conception and who had no other obstetric risk factors. Material(s) and Method(s): We reviewed pregnancy outcome of patients who underwent gastric bypass 18 to 48 months before pregnancy. Result(s): Total population was 44 patients: 35 had uncomplicated pregnancies and 9 (20.5%) had IUGR and oligohydramnios. Their pregnancies before bypass were uncomplicated. All 9 patients were labor induced at 34 to 35 weeks; seven of them delivered vaginally and two by cesarean. Birth weight ranged from 1728-2041 grams and hospital stay between 9-38 days. Conclusion(s): In our population, pregnancies in patients with gastric bypass were at increased risk of IUGR. The risk persists beyond 18 months post bypass surgery, therefore fetal growth should be monitored closely.

Database: EMBASE

68. Bariatric surgery in pregnancy: Benefits, risks and obstetric management

Author(s): Gidiri M.F.; Greer I.A.

Source: Fetal and Maternal Medicine Review; May 2011; vol. 22 (no. 2); p. 109-122

Publication Date: May 2011

Publication Type(s): Article

Available at Fetal and Maternal Medicine Review - from ProQuest (Health Research Premium) - NHS Version

Available at Fetal and Maternal Medicine Review - from Unpaywall

Database: EMBASE

69. Anemia during pregnancy after silastic ring Roux-en-Y gastric bypass: influence of time to conception.

Author(s): Nomura, Roseli Mieko Yamamoto; Dias, Maria Carolina Gonçalves; Igai, Ana Maria Kondo; Paiva, Letícia Vieira; Zugaib, Marcelo

Source: Obesity surgery; Apr 2011; vol. 21 (no. 4); p. 479-484

Publication Date: Apr 2011

Publication Type(s): Journal Article

PubMedID: 21336558

Available at Obesity surgery - from SpringerLink - Medicine

Available at Obesity surgery - from ProQuest (Health Research Premium) - NHS Version

Abstract:BACKGROUNDBariatric surgery before pregnancy may help prevent obesity-related gestational complications. However, maternal malnutrition is not without potential risks during pregnancy. The objective was to evaluate the influence of time to conception after silastic ring Roux-en-Y gastric bypass (SRYGB) on maternal anemia.METHODSPatients who underwent SRYGB for morbid obesity and who subsequently became pregnant were followed up at the prenatal. Thirty pregnancies occurred between July 2001 and September 2009. The patients were analyzed according to time to conception after bariatric surgery: 17 patients with time to conception <4 years (48 months) and 13 patients with ≥ 4 years.RESULTSFirst trimester hemoglobin levels were significantly lower in patients with time to conception ≥ 4 years (48 months) (median 9.6 g/dL, range 5.8-13.2 g/dL) than in patients with time to conception <4 years (median 11.1 g/dL, range 9.8-13.6 g/dL; p=0.047). The need for intravenous iron therapy or packed red cell transfusion was significantly more frequent among women who became pregnant ≥ 4 years after SRYGB compared to <4 years (30.8% vs. 0%, p=0.026).CONCLUSIONPregnancy after 4 years of SRYGB is associated with maternal anemia and the need for more strict iron supplementation.

Database: Medline

70. Contraceptive use among women with a history of bariatric surgery: a systematic review.

Author(s): Paulen, Melissa E; Zapata, Lauren B; Cansino, Catherine; Curtis, Kathryn M; Jamieson, Denise J

Source: Contraception; Jul 2010; vol. 82 (no. 1); p. 86-94

Publication Date: Jul 2010

Publication Type(s): Journal Article Review Systematic Review

PubMedID: 20682146

Abstract:BACKGROUNDWeight loss after bariatric surgery often improves fertility but can pose substantial risks to maternal and fetal outcomes. Women who have undergone a bariatric surgical procedure are currently advised to delay conception for up to 2 years.STUDY DESIGNWe conducted a systematic review of the literature, from database (PubMed) inception through February 2009, to evaluate evidence on the safety and effectiveness of contraceptive use among women with a history of bariatric surgery.RESULTSFrom 29 articles, five met review inclusion criteria. One prospective, noncomparative study reported 2 pregnancies among 9 (22%) oral contraceptive (OC) users following biliopancreatic diversion, and one descriptive study reported no pregnancies among an unidentified number of women taking OCs following laparoscopic adjustable gastric banding. Of two pharmacokinetic studies, one found lower plasma levels of norethisterone and levonorgestrel among women having had a jejunoileal bypass, as compared to nonoperated, normal-weight controls. The other study found no difference in plasma levels of D-norgestrel between women having a jejunoileal bypass of either 1:3 or 3:1 ratio between the length of jejunum and ileum left in continuity, but women with a 1:3 ratio had significantly higher plasma levels of D-norgestrel than extremely obese controls not operated upon.CONCLUSIONSEvidence regarding OC effectiveness following a bariatric surgical procedure is quite limited, although no substantial decrease in effectiveness was identified from available studies. Evidence on failure rates for other contraceptive methods and evidence on safety for all contraceptive methods was not identified.

Database: Medline

71. Reproductive outcome after bariatric surgery: a critical review.

Author(s): Guelinckx, Isabelle; Devlieger, Roland; Vansant, Greet

Source: Human reproduction update; 2009; vol. 15 (no. 2); p. 189-201

Publication Date: 2009

Publication Type(s): Research Support, Non-u.s. Gov't Journal Article Review

PubMedID: 19136457

Abstract:BACKGROUNDAfter many cycles of weight loss and weight gain, more and more morbidly obese patients undergo bariatric surgery, like gastric banding or gastric bypass, as the ultimate treatment for their obesity-problem. Since women of reproductive age are candidates for bariatric surgery, concerns arise regarding the potential impact on future pregnancy.METHODSEnglish-language articles were identified in a PUBMED search from 1982 to January 2008 using the keywords for pregnancy and bariatric surgery or gastric bypass or gastric banding.RESULTSThe few reported case-control and cohort studies clearly show improved fertility and a reduced risk in obstetrical complications, including gestational diabetes, macrosomia and hypertensive disorders of pregnancy, in women after operatively induced weight loss when compared with morbidly obesity women. The incidence of intrauterine growth restriction (IUGR) appears to be increased, however. No

conclusions can be drawn concerning the risk for preterm labour and miscarriage, although these risks are probably increased compared with controls matched for body mass index. Operative complications are not uncommon with bariatric surgery and several cases have pointed to the increased risk for intestinal hernias and nutritional deficiencies in subsequent pregnancy. Deficiencies in iron, vitamin A, vitamin B(12), vitamin K, folate and calcium can result in both maternal complications, such as severe anaemia, and fetal complications, such as congenital abnormalities, IUGR and failure to thrive.CONCLUSIONSClose supervision before, during and after pregnancy following bariatric surgery and nutrient supplementation adapted to the patient's individual requirements can help to prevent nutrition-related complications and improve maternal and fetal health, in this high-risk obstetric population.

Database: Medline

72. Impact of bariatric surgery on female reproduction

Author(s): Merhi Z.O.

Source: Fertility and Sterility; Nov 2009; vol. 92 (no. 5); p. 1501-1508

Publication Date: Nov 2009

Publication Type(s): Article

PubMedID: 19665703

Abstract: Objective: To evaluate the current literature on the impact and potential mechanisms of surgical weight loss on female reproduction, with a focus on changes in reproductive hormone profile, fertility status, measures of ovarian reserve, efficacy of oral contraception, sexuality, and pregnancy. Design(s): Appraisal of articles relevant to surgical weight loss and female reproduction. Result(s): The altered reproductive hormone profile associated with morbid obesity seems to reverse, either partially or totally, after surgical weight loss. Although bariatric surgery seems to improve fertility status and many of the complications associated with obesity in pregnancy, it may be linked to oral contraceptive failure. Although mullerian-inhibiting substance is a direct measure of ovarian reserve, its level changes with obesity and after surgical weight loss. There is a decrease or no change in the risk of miscarriage after bariatric surgery. An improvement in sexual function may follow dramatic surgical weight reduction; however, the possibility of a detrimental influence afterward can occur. Conclusion(s): The increasing popularity of bariatric surgery in reproductive-age women calls for greater clinician awareness of its impact on female reproduction.

Database: EMBASE

73. Pregnancy following gastric bypass surgery: What is the expected course and outcome?

Author(s): Munting K.; Stubbs R.; Sapre N.; Pandita A.

Source: New Zealand Medical Journal; Nov 2009; vol. 122 (no. 1306); p. 33-42

Publication Date: Nov 2009

Publication Type(s): Article

PubMedID: 20145685

Available at New Zealand Medical Journal - from ProQuest (Health Research Premium) - NHS Version

Abstract: Aim: To examine the course of pregnancy, labour, and the neonatal period in a group of women who have become pregnant following gastric bypass surgery for severe obesity. Method(s): Women who had experienced pregnancy following gastric bypass surgery were identified by an initial questionnaire. A second questionnaire was sent to those identified by the first questionnaire, who were willing to provide details concerning such pregnancies. Result(s): Seventeen women experienced a total of 24 pregnancies and 25 live births. Five had experienced difficulties with conception or pregnancy prior to surgery. The average maternal weight gain was 6.13 kg. No major problems with fetal growth were observed. Babies were delivered at a mean gestational age of 37.5 weeks and with a mean birth weight of 3038 g. Six women reported a complication during pregnancy (25%) and five a complication in labour (20%). Two babies born to the same mother had congenital abnormalities attributable to a rare genetic disorder. Conclusion(s): The course of pregnancy and labour appears normalised for severely obese women following gastric bypass surgery. The weight loss and marked reduction in food intake following gastric bypass surgery does not lead to growth or development problems for offspring. Careful monitoring of expectant mothers who have undergone gastric bypass surgery is nevertheless to be recommended. ©NZMA.

Database: EMBASE

74. Pregnancy nutritional indices and birth weight after Roux-en-Y gastric bypass.

Author(s): Faintuch, Joel; Dias, Maria Carolina Gonçalves; de Souza Fazio, Eliener; de Oliveira, Fernanda Castello Branco Mariz; Nomura, Roseli Mieko Yamamoto; Zugaib, Marcelo; Cecconello, Ivan

Source: Obesity surgery; May 2009; vol. 19 (no. 5); p. 583-589

Publication Date: May 2009

Publication Type(s): Journal Article

PubMedID: 18953618

Available at Obesity surgery - from SpringerLink - Medicine

Available at Obesity surgery - from ProQuest (Health Research Premium) - NHS Version

Abstract:BACKGROUNDMaternal metabolic profile and nutritional course of pregnancy after bariatric interventions is incompletely known. Their impact on birth weight has also not been hitherto addressed. Aiming to document such variables, a retrospective study was undertaken.METHODSWomen previously submitted to silastic ring Roux-en-Y gastric bypass, who conceived after 0-5 years (n = 14), were investigated. Intake of selected macro- and micronutrients, representative laboratory measurements, and correlation of these findings with birth weight and time to conception was documented.RESULTSMean calorie intake was restricted to about 1,800 kcal/day. Protein (71 +/- 17 g/day) and supplementary iron (60 mg/day) were barely adequate, and calcium and vitamin B(12) did not meet current recommendations, only folic acid being optimal. Biochemical monitoring reflected these inconsistencies, with occasional low values for serum albumin (4.1 +/- 0.4 g/dL), hemoglobin (11.4 +/- 1.5 g/dL), iron (78 +/- 50 mug/dL) and vitamin B(12)

(193 +/- 102 pg/mL) but not folate. Lipids, glucose, and uric acid were much better than before the anti-obesity intervention. Reduced plasma lipids, glucose, and uric acid were associated with larger birth weight, albeit within the normal range.CONCLUSIONS(1) Anemia as well as additional nutritional deficits during pregnancy were not totally eliminated, despite dietary guidance and micronutrient supplementation; (2) alleviation of metabolic comorbidities was demonstrated, and improved normalization predicted higher birth weight; (3) energy and folate intake was sufficient, but other nutrients probably did not reach ideal levels; (4) recent dietary guidelines for this population represent a step forward, but additional studies are needed.

Database: Medline

75. Polycystic ovary syndrome in the adolescent.

Author(s): Pfeifer, Samantha M; Kives, Sari

Source: Obstetrics and gynecology clinics of North America; Mar 2009; vol. 36 (no. 1); p. 129-152

Publication Date: Mar 2009

Publication Type(s): Journal Article Review

PubMedID: 19344852

Abstract: Polycystic ovary syndrome (PCOS) is now recognized as a heterogeneous disorder that results in overproduction of androgens, primarily from the ovary, leading to anovulation and hirsutism and is associated with insulin resistance. Long-term sequellae of PCOS include higher risk for diabetes, obesity, metabolic syndrome, endometrial hyperplasia, and anovulatory infertility. Symptoms in the adolescent include oligomenorrhea, hirsutism, acne, and weight gain. Insulin resistance, impaired glucose tolerance, and diabetes have also been demonstrated in adolescents who have PCOS. Treatment should be instituted early to decrease symptoms and long term sequellae of PCOS. Weight loss, oral contraceptives, and antiandrogens are effective in treating the symptoms of this disorder. Insulin-sensitizing medications have been shown to be effective but should be used with caution until larger randomized trials have shown short- and long term benefits and efficacy over traditional therapies in the adolescent population.

Database: Medline

Strategy 766283

#	Database	Search term	Results
1	Medline	exp "BARIATRIC SURGERY"/	24167
2	Medline	(bariatric* ADJ2 surg*).ti,ab	15247
3	Medline	("Gastric Bypass" OR Gastroplast* OR "Jejunoileal Bypass*" OR Lipectom*).ti,ab	13546
4	Medline	exp OBESITY/su	17970
5	Medline	(bariatric*).ti,ab	17339
7	Medline	("Stomach Stapling").ti,ab	6
8	Medline	(1 OR 2 OR 3 OR 4 OR 5 OR 7)	35802
9	Medline	(pregnan* OR obstetric* OR maternal).ti,ab	661109
10	Medline	exp PREGNANCY/	876687
11	Medline	(9 OR 10)	1087914
12	Medline	(8 AND 11)	859
13	Medline	("vitamin D").ti,ab	58735
14	Medline	exp "VITAMIN D"/	57199
15	Medline	("vitamin D deficiency").ti,ab	11719
16	Medline	exp "VITAMIN D DEFICIENCY"/	26865
17	Medline	(13 OR 14 OR 15 OR 16)	89519
18	Medline	(12 AND 17)	22
19	Medline	(iron ADJ2 supplement*).ti,ab	6261

20	Medline	exp "IRON, DIETARY"/	2862
21	Medline	exp "IRON, DIETARY"/ OR exp "ANEMIA, IRON-DEFICIENCY"/	11469
22	Medline	(iron ADJ2 deficienc*).ti,ab	19959
23	Medline	(19 OR 20 OR 21 OR 22)	27742
24	Medline	(12 AND 23)	35
25	Medline	(glucose ADJ2 monitor*).ti,ab	11303
26	Medline	exp "BLOOD GLUCOSE"/	159753
27	Medline	(25 OR 26)	165065
28	Medline	(12 AND 27)	20
29	Medline	((fetal OR fetus OR foetal) ADJ2 (development OR growth OR retard*)).ti,ab	33514
30	Medline	exp "FETAL DEVELOPMENT"/	90241
31	Medline	exp "FETAL GROWTH RETARDATION"/	15869
32	Medline	exp "INFANT, SMALL FOR GESTATIONAL AGE"/	7032
33	Medline	("small for gestational age").ti,ab	9618
34	Medline	("intrauterine growth restriction" OR IUGR).ti,ab	8285
35	Medline	(29 OR 30 OR 31 OR 32 OR 33 OR 34)	131659
36	Medline	(12 AND 35)	133
37	Medline	("contraceptive pill*").ti,ab	3425

38	Medline	exp "CONTRACEPTIVES, ORAL"/	48546
39	Medline	(oral* ADJ2 contraceptive*).ti,ab	21549
40	Medline	(37 OR 38 OR 39)	56426
41	Medline	(8 AND 40)	52
42	Medline	(18 OR 24 OR 28 OR 36 OR 41)	234
43	Medline	42 [Languages English]	209
44	EMBASE	exp "BARIATRIC SURGERY"/	41948
45	EMBASE	(bariatric* ADJ2 surg*).ti,ab	29457
46	EMBASE	("Gastric Bypass" OR Gastroplast* OR "Jejunoileal Bypass*" OR Lipectom*).ti,ab	24890
47	EMBASE	exp OBESITY/su	17806
48	EMBASE	(bariatric*).ti,ab	34364
49	EMBASE	("Stomach Stapling").ti,ab	14
50	EMBASE	(44 OR 45 OR 46 OR 47 OR 48 OR 49)	60467
51	EMBASE	(pregnan* OR obstetric* OR maternal).ti,ab	831509
52	EMBASE	exp PREGNANCY/	645825
53	EMBASE	(51 OR 52)	1049237
54	EMBASE	("vitamin D").ti,ab	87443
55	EMBASE	exp "VITAMIN D"/	136661
56	EMBASE	exp "VITAMIN D DEFICIENCY"/	28580

57	EMBASE	("vitamin D deficiency").ti,ab	19940
58	EMBASE	(54 OR 55 OR 56 OR 57)	152059
59	EMBASE	exp "IRON ABSORPTION"/	4139
60	EMBASE	exp "IRON DEFICIENCY"/	15587
61	EMBASE	(iron ADJ2 deficienc*).ti,ab	28129
62	EMBASE	("iron supplement*").ti,ab	7174
63	EMBASE	exp "IRON THERAPY"/	8111
64	EMBASE	(iron).ti,ab	208712
65	EMBASE	(59 OR 60 OR 61 OR 62 OR 63 OR 64)	213273
66	EMBASE	(glucose ADJ2 monitor*).ti,ab	15662
67	EMBASE	exp "BLOOD GLUCOSE MONITORING"/	24788
68	EMBASE	exp "GLUCOSE BLOOD LEVEL"/	240172
69	EMBASE	("blood glucose").ti,ab	102979
70	EMBASE	(66 OR 67 OR 68 OR 69)	279613
71	EMBASE	((fetal OR fetus OR foetal) ADJ2 (development OR growth OR retard*)).ti,ab	38894
72	EMBASE	exp "FETAL DEVELOPMENT"/	27135
73	EMBASE	exp "FETAL GROWTH RETARDATION"/	42121
74	EMBASE	exp "INFANT, SMALL FOR GESTATIONAL AGE"/	14784
75	EMBASE	("small for gestational age").ti,ab	13218

76	EMBASE	("intrauterine growth restriction" OR IUGR).ti,ab	13612
77	EMBASE	(71 OR 72 OR 73 OR 74 OR 75 OR 76)	95890
78	EMBASE	("contraceptive pill*").ti,ab	5188
79	EMBASE	exp "CONTRACEPTIVES, ORAL"/	60180
80	EMBASE	(oral* ADJ2 contraceptive*).ti,ab	27555
81	EMBASE	(78 OR 79 OR 80)	68060
82	EMBASE	(50 AND 53 AND 58)	100
83	EMBASE	(50 AND 53 AND 65)	108
84	EMBASE	(50 AND 53 AND 70)	71
85	EMBASE	(50 AND 53 AND 77)	220
86	EMBASE	(50 AND 53 AND 81)	84
87	EMBASE	(82 OR 83 OR 84 OR 85 OR 86)	479
88	EMBASE	(conference OR comment OR note OR letter).pt	6274493
89	EMBASE	87 not 88	313
90	EMBASE	89 [DT FROM 2009] [English language]	249