Case Report

Adverse Reproductive Health Outcome in Morbid Obesity

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Abstract

A 35-year-old, P0[+4], morbidly obese, hypertensive lady, presented with secondary infertility. She conceived with ovulation induction treatment after reducing her body weight to 103 kg from initial 125 kg. She developed Gestational Diabetes Mellitus (GDM), pre-eclampsia, mild polyhydramnios and urogenital and chest infections. She remained in the hospital throughout her pregnancy. Emergency lower segment Caesarean section was performed due to sudden rise in her blood pressure and poor bishop score at 36[+6] weeks. An alive, female baby was delivered with good APGAR score (8/10 and 10/10). Purpose of presenting this case is to illustrate obesity related medical and reproductive complications. Strategies for management of such morbidly obese patients developing various obesity related complications have been highlighted.

Key words: Obesity, morbid obesity, pregnancy, gestational diabetes, pregnancy outcome, high-risk pregnancy.

Introduction

Obesity is defined in terms of Body Mass Index (BMI) and is calculated by dividing body weight in Kg by square of height in meters (kg/m^2).[1] Its prevalence is on the rise[2] and is spreading to less affluent countries attaining a pandemic status, with a higher prevalence in females.[3] The incidence of obesity in pregnant women varies from 15-38 percent and is rising further.[4] Pregravid maternal obesity is a well recognised major risk factor for adverse reproductive health outcomes, prolonged hospital stay, increased use of health care services and thus increased direct and indirect cost,[5] to healthcare providing system. This lady developed a variety of medical and obstetric complications associated with obesity. Pathophysiology of obesity and strategies for management of morbidly obese patients has been reviewed.

Case Report

A thirty five-year-old, morbidly obese, nulliparous, hypertensive nurse presented, who had been married for five years with four first trimester miscarriages with the last, one and-a-half year ago. She also had history of backache, joint pains and sleep apnoea. She had ovulatory dysfunction with prolonged menstrual cycles,

(5-6/45-60 days), but the flow was normal. Previously, she was hospitalized for treatment of hypertension. Her three sisters and one brother are not obese. She had no family history of diabetes mellitus or hypertension. She wished to conceive, therefore she was advised weight reduction. She received ovulation induction treatment (tablets clomiphene citrate 50 mg daily for five days from day 2 of the cycle), after reduction of her weight to 103 from 125 Kg by diet control alone. She reported to out-patient clinic with gestational amenorrhoea of 5 weeks and raised blood pressure (140/90 mmHg). Urine pregnancy test was positive, and ultrasound scan showed 4 weeks gestational sac (12mm) with no foetal pole. She was admitted in the hospital for hypertension and was monitored by four hourly blood pressure measurements. Her general physical examination revealed body weight of 103 kg and height of 1.49 meters (BMI=45.9) and her thyroid was not enlarged. Her systemic examination did not reveal any abnormality. Complete blood counts showed haemoglobin level of 11.0 g/dl. Urine routine examination, renal and liver function tests, prothrombin time, activated thromboplastin time and coagulation profile, were within normal limits. Fasting plasma glucose was 4.5mmol/l. Fundoscopy and ECG did not show any abnormality. Anti-platelet therapy (aspirin tablets 75 mg once daily) and folic acid tablets 5 mg once daily were started to prevent foetal congenital abnormalities. Ultrasound scan after 2 weeks showed a gestational sac of 6 weeks with foetal pole and foetal heart beat. Progesterone support was given due to bad obstetric history. Her blood pressure was initially controlled with bed rest but later, she required alpha-methyldopa 250 mg tablets twice daily. She was placed on ferrous sulphate 200 mg tablets, thrice a day after 12 weeks of pregnancy. Anomaly scan was done at 22 weeks which did not reveal any pathology. At 23 weeks her fasting plasma glucose was 6mmol/dl and post-prandial plasma glucose was 11 mmol/l. Gestational diabetes mellitus was diagnosed, which was controlled by diet and 8 iu of plain insulin three times a day.

At 25 weeks she developed chest infection and asthmatic bronchitis which was treated with cephalosporin. At 26 weeks she developed urinary tract infection which was treated with amoxicillin according to culture and sensitivity report. At 28 weeks her haemoglobin was 8g/dl. She was given parentral iron sorbitol (venofer) as she had poor compliance. Serial ultrasound scans were performed for foetal growth and foetal wellbeing. Mild polyhydramnios (AFI=20) was noticed at 32 weeks. Regular CTGs and biophysical profile were maintained after 34 weeks. The dose of insulin was gradually increased to 20 iu 70/30 insulin (Mixtard) twice daily. In the last trimester she had difficulty in walking and even lying on the bed. She spent most of her time by sitting on the couch. Her hospital stay, on the whole, was around 8 months. At 36 weeks and 4 days she complained of headache, epigastric pain and decreased foetal movements. There was sudden rise in her blood pressure to 180/120 mmHg. The CTG and biophysical profile were normal. Bishop score was 2 therefore an emergency lower segment caesarean section was performed under spinal anaesthesia. Because of her extreme obesity appropriate positioning for administering spinal anaesthesia was difficult and she needed repeated lumber punctures to enter the subdural space. Pfannestiel incision was given. Extra staff was required to assist and retract the abdominal walls for adequate exposure of the operation field. Transverse incision was given in lower uterine segment. There was mild blood loss during surgery. An alive female baby weighing 2.5 kg was delivered with APGAR score 8/10 at one minute and 10/10 at 5 minutes. The baby was attended by the paediatrician. Uterus and abdomen were closed

in layers. Skin was closed with interrupted Prolene sutures. Her post-natal stay was prolonged due to admission of her baby in Intensive therapy Unit. Post operatively she was encouraged early ambulation. Low dose heparin (5000 iu subcutaneously) was started prophylactically to prevent thromboembolism. Stitches were removed on 7th post-operative day. The wound was healthy. On third day the baby had umbilical cord bleed, her platelet count was 20000, she was shifted to the nursery and was transfused with two units of platelet concentrate. The baby was discharged from there after five days in satisfactory condition. Follow-up platelets count was normal. The mother was discharged on 8th post-operative day. The latter was called for follow-up after six weeks. Lactation had established with difficulty.

Discussion

Obesity is defined as an excess accumulation of body fat. It is the amount of this excess fat that correlates with ill-health. A number of measures are used to estimate body fat and thus the health risk. These can be grouped as density-based (hydrodensitometric body fat percentage-BF%,[5] air displacement plethysmography), scanning by (computerized tomography, magnetic resonance imaging, dual-energy x-ray absorptiometry), bioelectrical impedance and anthropometric (skin-fold, waist circumference and waist-hip ratio-WHR)[6] or those methods which are based on height-weight ratio such a Body Mass Index (BMI) and Rohrer's Ponderal Index (either Rohrer's Index-RI, or the Ponderal Index-PI). It is the BMI which is in common use and is considered as the cornerstone of the current classification system for obesity. Its advantages are widely exploited across the disciplines, ranging from international surveillance to individual patient assessment. However, like all anthropometric measurements, it is only a surrogate measure of body fatness.[7] In terms of body mass index obesity can be defined as BMI of >30 kg/m^2, but the definition of morbid obesity is variable. WHO expert committee defined BMI>39.9 as morbid obesity, whereas another study classified BMI>35 as morbid obesity.[8] BMI is reliable and a valid measure of identifying adults at risk of overweight and obesity related morbidity and mortality and is the basis to define risk categories according to WHO[9] (Table I), although its universal use as a surrogate for body fat percentage has been debated and lower cut-off points have been suggested for Asians.[4]

Table I. Classification of weight

Body Mass Index	WHO classification	Popular description
< 18.5 kg/m^2	Underweight	Thin
18.5-24.9 kg/m^2	—	Healthy, normal or acceptable weight
25.0-29.9 kg/m^2	Grade 1 overweight	Overweight
30.0-39.9 kg/m^2	Grade 2 overweight	Obesity
> 40.0 kg/m^2	Grade 3 overweight	Morbid obesity

It is central fat (also described as intra abdominal- IA, or visceral) which is more pathogenic.[7] Adults with large waist circumferences have excess morbidity.[10] Levels and the distribution of fat differ according to sex and ethnicity. Generally, there is 30% fat in females and South Asian people appear to be more sensitive to the metabolic consequences of obesity than white people.[11] The gynoid (female, or 'pear') pattern is the accumulation of fat in greater amounts in the hip and thigh areas.[12] Female lower body fat is metabolically less active than that in the abdominal region, and is readily mobilized during pregnancy and lactation. Maternal metabolism changes substantially during pregnancy. There is anabolic state during early gestation in the mother with an increase in maternal fat stores and slightly increased insulin sensitivity so that nutrients

response leading to early cessation of lactation. However breast feeding is strongly recommended as it helps in reducing the weight and in the involution of organs. Moreover, it reduces the incidence of childhood obesity in infants.[21] Long term follow up is needed for these patients to minimise possibility of long term complications.

This morbidly obese patient (Grade IV) had hypertension, ovulatory dysfunction, backache, joint pains and sleep-apnoea syndrome. She presented with recurrent miscarriages and sub-fertility. Ovulation was induced after reduction of 22 Kg body weight by strict diet management. She developed multiple obesity-related complications such as pre-eclampsia, gestational diabetes mellitus, genitourinary and chest infections, asthmatic bronchitis, and anaemia. She remained in the hospital for a prolonged period of almost eight months for continuous management. The baby was delivered by emergency LSCS at 36+6 weeks gestation due to decreased foetal movements, sudden rise in blood pressure and poor bishop score. The possible complications in obesity (ABC of obesity) are summarized in Appendix I.[22]

Conclusion

Obesity poses a variety of significant medical and reproductive health problems to women and their offsprings. Strategies for management of obese patients before, during and after pregnancy have been developed which need to be adopted in order to minimise the occurrence of obesity related complications.

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Appendix I. Potential Maternal and Foetal adverse effects (ABC) of Obesity.[22]

Period	Complications
Preconception	Menstrual disorders polycystic ovary syndrome (PCOS) pituitary/gonadal dysfunction and infertility lower chance of pregnancy following IVF and higher requirement of Gonadotrophins ,Pickwickian/sleep apnoea Dermatological problems (acanthosis nigricans, skin tags, hyperandrogenism, striae distensae, plantar hyperkeratosis, and candidal intertrigo) Osteoarthritis, Cardiomyopathy, chronic cardiac dysfunction, non-alcoholic fatty liver disease, Gall bladder disease.
Early pregnancy	Spontaneous abortions. congenital anomalies (neural tube defects, anencephaly, hydrocephaly, spina bifida, heart defects, hypospadias, limb reduction defects, diaphragmatic , hernia, omphalocoele, anorectal atresia), birth defects, Difficult ultrasound examination
Antenatal	Pregnancy induced (gestational) hypertension Proteinuria and pre-eclampsia eclampsia, pre-gestational diabetes and gestational diabetes , anaemia, UTI
Intrapartum	Post-term labour, cephalopelvic disproportion and prolonged second stage of labour, Increased frequency of induction of labour and early, amniotomy, oxytocin stimulation, high incidence of failed induction, Abnormal presentations, Cervical dystocia, shoulder dystocia and brachial plexus injury, Increased incidence of instrument delivery, 3rd and 4th degree tears and caesarean delivery , puerperal infections (endometritis, vulvitis, chorioamnionitis) Prolonged hospital stay
Operative	increased blood loss, prolonged surgery time medical errors during surgery, retained foreign bodies (surgical instruments/gauze/sponges) Postpartum endometriosis, surgical site/wound infection delayed, wound healing, wound disruption, Endomyometritis
Anaesthesia complications	Difficult intubation, necessity of high dosages of anaesthetic medication, problems with subarachnoidal and epidural anaesthesia, increased likelihood of failed epidural anaesthesia
Postpartum	Haemorrhage, infection, venous thromboembolism
Foetal and Neonate	Pre-term birth, small for gestational age (IUGR), spontaneous intrauterine demises (IUD), stillbirth macrosomia, low APGAR score meconium aspiration, early neonatal death, fetal distress, peri-natal morbidity/mortality, birth injury, thrombocytopenia, Decreased rates of breastfeeding initiation or continuation
Infant	Childhood obesity

Morbid Obesity is not just a social issue but it's a matter of the patient's health also.