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CLINICAL INFORMATION

Insulinoma and pregnancy: anesthesia and perioperative management☆

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Abstract Insulinoma is a functional neuroendocrine tumor derived from beta cells of the pancreatic islets of Langerhans, usually solitary, benign, and curable with surgery (enucleation). It rarely occurs during pregnancy and is clinically manifested by hypoglycemia, particularly in the first trimester of pregnancy. During pregnancy, both conservative therapeutic measures (medication) and surgical treatment are challenging regarding the impossibility of studies on drug teratogenicity as well as the maternal-fetal repercussions during surgery, such as hypoglycemia and changes due to stress.

Case report: A 33-year primiparous woman, 86 kg, 1.62 m, BMI 32.7 kg·m^{-2}, at 15 weeks' gestation, physical status ASA III, investigated for a reduced level of consciousness. Laboratory tests showed: hypoglycemia (45 mg.dL^{-1}) associated with hyperinsulinemia (24 nUI.mL^{-1}), glycosylated hemoglobin (4.1%); other laboratory findings and physical examination were normal. Magnetic resonance imaging showed a 1.1 cm nodule in the pancreatic tail with suspected insulinoma. Due to the difficult glycemic control with bolus and continuous infusion of glucose, laparotomy was performed for tumor enucleation under total intravenous anesthesia combined with epidural block. Monitoring, central and peripheral venous access, radial artery catheterization, diuresis, and glucosimetry were recorded every 15 minutes. Intraoperatively, there was severe hypoglycemia while handling the tumor and shortly before its enucleation, which was controlled through continuous infusion of 10% glucose balanced crystalloid solution (100–230 mL.h^{-1}). The patient's postoperative evolution was uneventful, with resolution of hypoglycemia and total withdrawal of glucose intravenous infusion.

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PALAVRAS-CHAVE
Tumor neuroendócrino: insulinoma;
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Hipoglicemia e hiperglicemia;
Gravidez

Insulinoma e gestação: anestesia e manejo perioperatório

Resumo O insulinoma é um tumor neuroendócrino funcional de células beta das ilhotas de Langerhans pancreáticas, geralmente solitários, benignos, curáveis com cirurgia (enucleação). Raramente ocorre durante a gravidez e se manifesta clinicamente por hipoglicemia, principalmente no primeiro trimestre da gravidez. Durante a gestação as condutas terapêuticas conservadoras (medicamentosas) e o tratamento cirúrgico constituem desafios tendo em vista a impossibilidade de estudos sobre teratogenicidade de fármacos, assim como as repercussões materno-fetais durante intervenções cirúrgicas, como a hipoglicemia e alterações decorrentes do estresse.
Relato de caso: Paciente com 33 anos, 86 Kg, 1,62m, IMC 32,7 $kg{\cdot}m^{-2}$, primigesta, 15 semanas de idade gestacional, estado físico III da ASA, investigada por rebaixamento do nível de consciência. Aos exames laboratoriais constataram-se: hipoglicemia (45 $mg.dL^{-1}$) associada à hiperinsulinemia (24 $nUI.mL^{-1}$) e hemoglobina glicosilada (4,1%); demais exames laboratoriais e exame físico normais. A ressonância magnética mostrou nódulo de 1,1 cm em cauda de pâncreas com hipótese de insulinoma. Devido ao difícil controle glicêmico com infusão em *bolus* e contínua de glicose, foi feita laparotomia para enucleação do tumor sob anestesia venosa total associada a bloqueio peridural. Monitoração, acesso venoso central e periférico, cateterização de artéria radial, diurese, glicosimetria a cada 15 minutos. No intraoperatório, observou-se hipoglicemia acentuada nos momentos de manipulação e imediatamente antes da enucleação do tumor, controlada com infusão contínua de solução cristaloide balanceada glicosada a 10% (100 a 230 ml/h). A evolução no pós-operatório seguiu sem intercorrências, com resolução dos quadros de hipoglicemia e retirada total da infusão venosa de glicose.

Introduction

Insulinoma is a functional neuroendocrine tumor derived from beta cells of the pancreatic islets of Langerhans, usually solitary, benign, curable with surgery (enucleation), and with an incidence of 1–4 per million/year, 20% in female patients.[1–3]

The insulinoma-pregnancy association is very rare, with about 20 cases been reported in the literature. During pregnancy, the conservative therapeutic approaches (drugs) and surgical treatment are challenges due to both difficulty to study drug teratogenicity in large populations and the uncertainty of maternal-fetal repercussions of surgical interventions, such as hypoglycemia and postoperative stress.[4,5] The aim of this report is to present the case report of a pregnant patient with insulinoma undergoing tumor enucleation under general anesthesia and epidural block.

Case report

Pregnant patient, 33 years old, 86 kg, height 1.62 m, BMI 32.7 $kg\,m^{-2}$, primipara, 15 weeks of gestational age, physical status ASA III, admitted in the emergency care for reduced level of consciousness investigation. Laboratory tests revealed hypoglycemia (45 $mg{\cdot}dL^{-1}$), associated with hyperinsulinemia (24 $nUI{\cdot}mL^{-1}$) and glycosylated hemoglobin (4.1%); other laboratory tests and physical examination were normal. Magnetic resonance imaging showed a 1.1 cm nodule in pancreatic tail, with a diagnostic hypothesis of insulinoma. For normoglycemia maintenance, dietary measures and continuous infusion of glucose were provided, but without success, requiring additional administration of repeated bolus of glucose. Due to the difficult glycemic control, despite continuous infusion of glucose, and the limited experience with the use of octreotide, beta-blockers, and diazoxide in pregnant women, the consensus among the responsible experts was for surgical treatment by laparotomy. At preanesthetic evaluation, the patient was in good general condition, ruddy, hydrated, upper extremity blood pressure (90× 60 mmHg), heart rate (70 bpm). The patient was on continuous infusion of glucose and, one hour before induction of anesthesia, ranitidine (50 mg) and metoclopramide (10 mg) were given.

In the operating room, monitoring was performed with cardioscope (DII), invasive blood pressure (radial artery), pulse oximetry, capnography. Central venous access and venipuncture in upper limb with a 14 G cannula, bladder catheter, glucosimetry every 15 minutes (min), and maintenance on continuous infusion of 10% glucose, adjusted according to glycemia. Faced with normal coagulation, with the patient in the sitting position, epidural anesthesia was performed with median puncture in L3-L4 with an 18G Tuohy needle. After the epidural space identification with the loss of resistance technique (syringe with air), bupivacaine 0.25% with epinephrine 1:200,000 (25 mg) associated with morphine (2 mg) were injected. After the blockade, the patient was positioned in the supine position and total intravenous anesthesia was initiated. Induction of anesthesia was obtained with sufentanil (50 μg) followed by propofol (150 mg) and atracurium (0.5 $mg{\cdot}kg^{-1}$). Subsequently, the patient was ventilated via face mask with 100% oxygen