Obstetric Forum

Lupus anticoagulant, paramyotonia congenita and pregnancy

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A case report is presented of the anaesthetic management of a parturient with paramyotonia congenita and lupus anticoagulant antibodies. She had been treated with prophylactic, subcutaneous heparin and aspirin throughout her pregnancy. Epidural analgesia was provided for labour and delivery.

On présente une observation décrivant l'anesthésie d'une parturiente porteuse de paramyotomie congénitale et d'anticorps anticoagulants de type lupus. Elle reçoit préventivement de l'héparine sous-cutanée et de l'aspirine pendant sa grossesse. L'anesthésie épidurale est choisie pour le travail et l'accouchement.

The myotonic dystrophies present many challenges to the anaesthetist. This is particularly true when anaesthesia may have to be provided rapidly for fetal distress. The depolarizing muscle relaxants are contraindicated as they may trigger a myotonic episode. The use of regional anaesthesia is desirable, but if the patient has been treated with heparin and anti-platelet medication (aspirin), many anaesthetists would avoid regional anaesthesia.¹ A case is presented of a parturient with paramyotonia congenita who was taking aspirin and heparin due to the presence of lupus anticoagulant antibodies.

Key words

ANAESTHESIA: obstetric, epidural;

COMPLICATIONS: lupus anticoagulant, paramyotonia congenita;

MEDICATIONS: aspirin, prophylactic heparin, prednisone.

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Accepted for publication 2nd July, 1992.

History

A 31-yr-old G5, P3 woman was admitted to hospital at 25-wk gestation for observation and bed rest due to the presence of oligohydramnios. Her previous pregnancies had resulted in a spontaneous first trimester abortion, two mid-trimester losses (secondary to abruptio placentae) and a successful vaginal delivery at 34-wk gestation.

During the successful pregnancy, the patient's blood was tested for antiphospholipid antibodies. Lupus anticoagulant and anticardiolipin antibodies were found and she was treated with prednisone, prophylactic heparin and aspirin from the thirteenth week of gestation.

This pregnancy was also complicated by lupus anticoagulant antibodies. Therapy consisted of aspirin 80 mg daily, prednisone 20 mg daily and heparin 7,500 u sc twice daily. She also had received three courses of iv immunoglobulin (IVIG) during this current pregnancy.

Laboratory findings included the presence of other auto-antibodies (antiplatelet, antinuclear and anticardiolipin) which were indicative of an auto-immune process. Platelet count and bleeding time were normal throughout the pregnancy.

The patient also suffered from paramyotonia congenita which was considered to have contributed to one of the previous pregnancy losses.² She was asymptomatic unless exposed to cold and required no medication for this condition. Asymptomatic mitral valve prolapse was also present. Her past medical history included one uneventful general anaesthetic for a rhinoplasty and epidural analgesia for her previous successful pregnancy. She had never had evidence of venous or arterial thromboses.

Before admission, ultrasound examination of the fetus and placenta had revealed an appropriately grown fetus, oligohydramnios and large placental lakes. These lakes were thought to reflect an autoimmune rejection process secondary to the lupus anticoagulant. Doppler study of the fetal and maternal-fetal circulations was normal.

Following admission, serial ultrasound examinations showed progressive oligohydramnios and placental lake formation. Based on these changes and the poor obstetric history, induction of labour was planned following evidence of fetal lung maturity.

At 31-wk gestation the aspirin was discontinued by the haematologist and the heparin decreased to 5000 u sc daily. Activated partial thromboplastin time (PTT) and bleeding times were normal. Amniocentesis was done and the lecithin/sphingomyelin ratio suggested transitional pulmonary maturity. Dexamethasone was administered over 48 hr to speed fetal maturity and was then followed by induction of labour using oxytocin.

Once a regular pattern of uterine contractions was established, an epidural catheter was inserted at L₂₋₃, without problems. Following a test dose of 3 ml of lidocaine 1.5% with epinephrine 1:200,000, labour analgesia was established with incremental doses of bupivacaine 0.25% (total 8 ml). She received one additional epidural injection of 4 ml bupivacaine 0.125% 60 min later. Labour progressed rapidly and she had a spontaneous vaginal delivery of a healthy 1800 g male, approximately two and one-half hours following institution of epidural analgesia. Apgar scores were 8 at one and 9 at five minutes. Placental pathology showed focal haemorrhage and decidual necrosis of the extraplacental membranes, suggestive of abruption and an unremarkable parenchyma.

Postpartum this patient developed steroid-induced diabetes and severe gastric discomfort which was poorly relieved with antacids. Withdrawal from prednisone was achieved slowly in the postpartum period and was associated with bone pain, arthralgia and myalgia.

Discussion: general considerations regarding medical conditions

Lupus anticoagulant

Lupus anticoagulant is an antiphospholipid antibody (IgG or IgM) which may occur in pregnancy and which is frequently associated with other auto-antibodies.³⁻⁵ The name is a misnomer, since the majority of patients with systemic lupus erythematosus (SLE) do not have this autoantibody and its predominant *in vivo* activity is that of thrombosis. *In vitro*, however, patients with lupus anticoagulant may demonstrate prolongation of the phospholipid-dependent coagulation tests (PTT and, rarely, PT).² These tests are unreliable in patients with this condition. In rare cases where bleeding has been associated with lupus anticoagulant, it has been attributed either to the underlying disease or to an associated haemostatic defect, such as thrombocytopaenia or hypoprothrombinaemia.⁵

Clinical effects of this antibody include widespread thrombosis of both arterial and venous systems and, in pregnancy, may lead to a high rate of fetal loss.³ This is thought to be due to a decidual vasculopathy leading to placental infarction. It frequently recurs in subsequent pregnancies and may be associated with the development of progressive pulmonary hypertension in severe cases.

Medical management aims to limit autoimmune damage and thromboembolic disease. Therapeutic or prophylactic (low-dose) heparin, in combination with aspirin and prednisone, is considered the most effective regimen. Courses of IVIG may also be administered with monitoring of autoantibody levels.

Paramyotonia congenita

This very rare, inherited condition shows autosomal dominance with complete gene penetrance. It is one of a group of related disorders which are collectively called the myotonic dystrophies. Characteristic features include the classical symptoms of muscle weakness, stiffness and myotonia which are precipitated by exposure to cold or following prolonged exercise.⁶ It is also associated with both hyperkalaemic and hypokalaemic states, although these may represent two distinct nosologic conditions.⁷ In common with the other myotonic dystrophies, myotonia may also be precipitated by the depolarising neuromuscular relaxants (e.g., succinylcholine). The diagnosis is usually made from the clinical and family history, with confirmatory evidence from electromyography, serology and muscle biopsy. The muscle contraction is a localized phenomenon and is unresponsive to treatment with muscle relaxants. It may also occur with regional anaesthesia.

The physiological cause of the myotonia is thought to be a defect of the sodium/potassium pump in the sarcolemma with abnormal calcium metabolism and ATPase systems. Exposure to cold produces spontaneous depolarisation of the sarcolemma and contraction of the myofibrils with a very slow relaxation phase. Delayed muscle relaxation after contraction is most evident in skeletal muscle, but some authors consider that smooth muscle may also be involved.² Treatment may include tocainide, hydrochlorothiazide and quinine or quinidine.

Although primarily a disease of muscle, the myotonic dystrophies should probably be considered multisystem disorders.⁶ They are frequently associated with a wide range of other pathological conditions which may affect considerably the management of the patient. These include cardiomyopathy, mitral valve prolapse and arrhythmias, infertility or a high fetal loss rate, poor respiratory reserve, mental retardation, cataracts and endocrine abnormalities. Paramyotonia congenita appears to be a milder form of myotonia and, due to its rarity, the association with these other systems is unclear.

Pregnancy-related complications have been reported with myotonic dystrophy. These include muscle weakness at or before 28-wk gestation and prolonged labour and postpartum haemorrhage.^{8,9} Neonatal myotonic dystrophy has been recognized in infants born to women with myotonic dystrophy and may result in neonatal mortality.¹⁰ These infants are frequently severely hypotonic with respiratory and feeding problems and foot deformities.

Anaesthetic considerations

This patient presented in the labour suite for elective induction at 31-wk gestation. Spontaneous, vaginal delivery was planned but the presence of placental lakes combined with the past history of abruptio placentae increased the possibility of surgical intervention.

The pregnant patient is considered at increased risk for pulmonary aspiration of gastric contents during induction of general anaesthesia. Therefore, rapid-sequence induction (RSI) with cricoid pressure and the administration of succinylcholine to provide rapid muscle relaxation is followed by tracheal intubation. In a patient with paramyotonia congenita this might lead to myotonic contracture and failure to intubate or even open the mouth, a potentially lethal situation. If general anaesthesia is necessary in these patients, an awake intubation, or a modified RSI using priming and/or high-dose non-depolarizing muscle relaxants are the possible options. Thermoregulation may be disturbed during general anaesthesia as well as regional anaesthesia which could lead to cold-induced muscle contractures. These complications increase the risk of morbidity and mortality in these patients in the emergency situation, such as Caesarean section.

Regional anaesthesia is also not without risk. This patient had been receiving both aspirin and prophylactic heparin and had antiplatelet antibodies. A careful review of her coagulation status was essential prior to inducing regional anaesthesia.

While regional anaesthesia is contraindicated in patients receiving therapeutic heparin, those on low-dose (prophylactic) heparin are not considered to be at increased risk of haemorrhage, providing the PTT is normal.¹¹ Thromboembolic disease is a greater risk and regional anaesthesia has demonstrable benefits in these patients.¹² Evaluation of coagulation in patients receiving aspirin or with thrombocytopenia is more controversial. The bleeding time has been shown not to be an accurate measure of the risk of bleeding.¹³ A good history and physical examination are probably, at present, the best determinants of adequate platelet function.

Fortunately, this patient's antiplatelet antibodies had never resulted in a lowered platelet count. The PT and PTT were also normal, in spite of the lupus anticoagulant. Platelet function was considered normal as there was no clinical evidence of bleeding or bruising. In view of these facts, it was considered safe and reasonable to offer this patient epidural anaesthesia.

While the production of sympathetic blockade in a patient at risk from abruption may be a disadvantage, there were several potential benefits in this patient. Excellent analgesia is possible in labour, with minimal sympathetic blockade, providing the level of sensory block is maintained at the T₁₀-L₁ level. With administration of warmed intravenous solutions as a preload and maintenance of a

warm environment, the potential effects of peripheral vasodilatation-induced hypothermia with production of myotonia could be minimized. As well, early epidural insertion permits rapid extension of the block should surgical intervention become necessary.

COMMENTARY

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I feel comfortable giving regional anaesthesia to patients receiving prophylactic heparin provided the PTT is normal. However, I find it more difficult to decide when to use regional anaesthesia in patients who might have abnormal platelet function in the presence of a normal platelet count. Unfortunately, an abnormal bleeding time is a poor predictor of the risk of surgical haemorrhage, although a normal value is reassuring. I see no reason for an anaesthetist to request a bleeding time unless prepared to use the result to determine whether to perform regional anaesthesia. Personally, I do not ask for a bleeding time in this situation, as I find the interpretation of an abnormal result difficult and confusing. I prefer to weigh the risks and benefits of regional anaesthesia, consulting with a haematologist when appropriate. Like the authors, I use the individual clinical picture as the primary determinant, remembering that serious problems with general anaesthesia are relatively common in obstetrics, while spinal and epidural haematomas are very rare. There are some borderline situations in which I would be prepared to use a 27-gauge spinal needle, rather than an epidural needle with a catheter, believing that this has less potential for vascular trauma.

The presence of lupus anticoagulant and its implications for the obstetric anaesthetist have been well summarized by the authors and recently reviewed by Davies (*Can J Anaesth* 1991; 38: 790-6).

Abruptio placentae in the full-blown clinical presentation is, I believe, a contraindication for regional anaesthesia because of the high risk of associated coagulation abnormalities and haemorrhage. Minor vaginal bleeding is unfortunately often labelled "marginal abruption" by exclusion and in this situation, if vital signs are stable and coagulation studies are normal, I do perform regional anaesthesia. If there is a real possibility of developing severe surgical haemorrhage (e.g., high risk of placenta accreta), I avoid regional anaesthesia. I have found that the management of severe haemorrhage in the awake patient is complicated by nausea and vomiting, shivering and

difficulty in monitoring and placing lines due to patient movement. Of course, one can convert at that time to general anaesthesia, but this is more hazardous than elective induction of anaesthesia. I also prefer such patients to have an intact sympathetic nervous system, although I am aware that many feel this to be unimportant.

I have had no experience with myotonic dystrophy in obstetrics. Avoidance of succinylcholine is obviously critical during general anaesthesia. For emergency Caesarean section, I would use spinal anaesthesia in all but the most urgent situations, while appreciating that myotonia may still occur in response to local surgical stimulation.

I congratulate the authors on the successful anaesthetic management of a fascinating patient.

COMMENTARY

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Use of regional anaesthesia in parturients receiving aspirin and/or prophylactic heparin

I remain very cautious when requested to perform regional anaesthesia on patients taking aspirin or heparin. A very thorough history related to bruising or bleeding and physical examination is mandatory, particularly since bleeding time is not considered to be an accurate measure of the risk of bleeding. It also depends on the reason why the patient is taking aspirin. In the case of the patient with severe pregnancy-induced hypertension, who may present with HELLP syndrome (haemolysis, elevated liver enzymes, low platelets), despite no evidence of bleeding on admission, the course of the disease can lead to rapid deterioration with coagulopathies. My formal answer to this question is that *it depends on the individual case!* Careful monitoring intrapartum and postpartum is essential to detect symptoms and signs of epidural haematomas.

Implications of lupus anticoagulant for the anaesthetist

Regional anaesthesia is not contraindicated. The name is a misnomer, and many patients suffer from thrombosis. One concern I have not seen addressed is the issue of utilization of epinephrine in the epidural or intrathecal space. I don't know if this puts the patient at additional risk of neurological compromise from spinal cord perfusion. The only problem facing the anaesthetist is the patient's therapeutic regimens (i.e., aspirin, etc.).

Use of regional anaesthesia in parturients at risk from abruptio placentae and/or haemorrhage

In the past three years I have changed my liberal view of

regional anaesthesia for the patient at risk of haemorrhage as the incidence of obstetric hysterectomy at this hospital has increased dramatically – from one per year in 1975–85 to five per year or more in 1988–1991. I will still use an epidural or spinal for patients with complete placenta praevia, who have not had a previous Caesarean section and who are not actively bleeding. Whether I use a block in a patient with an abruptio placentae depends on the cardiovascular stability of the patient, the urgency of the case and the coagulation status. Experience indicates that bleeding patients often require major intraoperative resuscitation and respiratory management, and I now like to have control from the start of the case. I prefer the patient to be anaesthetized!

Emergency anaesthetic management in parturients with the myotonic dystrophies

Malignant hyperthermia is associated with these muscle disorders. The anaesthetist should then proceed with this in mind and provide appropriate monitoring and have a vapour-free machine and dantrolene available, etc. I use regional anaesthesia in these patients if possible, and in the face of fetal distress, I would use spinal anaesthesia. Postoperative management in the intensive care unit may be required if general anaesthesia and pulmonary ventilation are necessary.

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