encontrar em época académica de exames, e pelo conforto posológico, procedeu-se à mudança de antibioterapia, que completou em ambulatório.

Findo o tratamento, alguns doentes mantêm sintomas inespecíficos (fadiga, parestesias, insónia, cefaleias, mialgias ou artralgias), o que tem levado à especulação de uma síndrome de fadiga crónica ou síndrome pós-doença de Lyme.[9,10] Múltiplos estudos efetuados neste grupo não apontam relevância na duração da antibioterapia no seu surgimento ou persistência.[10,11] Neste caso, a resolução da astenia foi dos pontos mais salientados.

Concluindo, sendo Portugal um destino cada vez mais frequente, com residentes estrangeiros temporários, o conhecimento da epidemiologia de doenças infecciosas típicas do viajante em espaço europeu não deve ser esquecido nos diagnósticos diferenciais em utentes que recorrem aos nossos serviços de saúde.

CONFLITO DE INTERESSES

Os autores declaram não ter nenhum conflito de interesses relativamente ao presente artigo.

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CONSENTIMENTO DO DOENTE

Obtido.

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Severe Postpartum Coagulopathy Without Haemorrhage: A Case Report

Coagulopatia Pós-Parto Severa Sem Hemorragia: Um Caso Clínico

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ABSTRACT

Postpartum haemorrhage is an important health issue worldwide, and it can be caused by uterine atony, retained placental tissue, trauma or coagulation disorders. Although coagulopathy represents a rare cause, it is a significant contributor to postpartum haemorrhage with poor outcomes. Associated with high morbidity and mortality rates, postpartum haemorrhage demands prevention, prompt diagnosis and effective management. We describe a unique case of severe coagulopathy caused by underestimated blood loss during caesarean section without postpartum bleeding, in which transfusion requirements were thromboelastometry-guided. This case report depicts how an early multidisciplinary approach and patient-centred care in an obstetric emergency contributes to a positive outcome from a challenging situation, enabling the prevention of an imminent, catastrophic haemorrhage.

Keywords: Blood Coagulation Disorders; Blood Transfusion; Postpartum Hemorrhage; Thrombelastography

RESUMO

A hemorragia pós-parto é um importante problema de saúde a nível global, podendo ser causada por atonia uterina, placenta retida, trauma ou distúrbios na coagulação. Apesar de ser uma causa rara, a coagulopatia é um fator decisivo nas consequências negativas associadas à hemorragia pós-parto. Devido à sua elevada taxa de morbilidade e mortalidade, a hemorragia pós-parto exige prevenção, diagnóstico precoce e intervenção efetiva. Descrevemos um caso clínico raro de coagulopatia severa sem hemorragia no pós-parto,

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causada por perdas hemáticas subestimadas durante a cesariana, e no qual os requerimentos transfusionais foram guiados por tromboelastometria. Este caso clínico reflete como uma abordagem multidisciplinar precoce, a uma emergência obstétrica, dá origem a um desfecho positivo numa situação desafiante, permitindo a prevenção de uma hemorragia catastrófica, iminente.

Palavras-chave: Hemorragia Pós-Parto; Transfusão de Sangue; Transtornos da Coagulação Sanguínea; Tromboelastografia

INTRODUCTION

Postpartum haemorrhage (PPH) is a major health issue affecting 2% of all parturient women worldwide.[1] When PPH, defined as blood loss superior to 500 mL in a vaginal delivery or 1000 mL in caesarean section,[2] occurs in the first 24 hours it can be categorised as primary PPH. The secondary PPH refers to haemorrhage occurring from 24 hours to a time frame of 6 weeks.[3] Most often linked with high morbidity and mortality rates, PPH demands prevention, prompt diagnosis and effective management.[4]

PPH can be due to uterine atony, retained placental tissue, trauma or coagulation disorders.[3] According to aetiology, PPH severity differs.[5] Controlling a PPH is quite challenging, and although several studies have been performed to address this issue, few high-quality evidence recommendations have been outlined.[6,7] This case report highlights the relevance of early postpartum coagulopathy diagnosis in the successful prevention of primary PPH.

CASE REPORT

A healthy, 35-years-old, primigravida woman was admitted for induction of labour at 38 weeks plus five days gestation. She had had an uneventful twin pregnancy, supervised in our hospital following an *in-vitro* fertilisation procedure. Combined sequential spinal-epidural analgesia technique was performed 37 hours after prolonged labour induction with misoprostol, and analgesia maintained with 0.2% ropivacaine and sufentanil. However, the labour failed to progress beyond 7 cm dilatation and a caesarean section (CS) under epidural anaesthesia with 0.75% ropivacaine was carried out five hours later. The surgery was completed uneventfully, with blood loss estimated at 500 mL and crystalloid input of 1000 mL. An intravenous bolus of 5 IU oxytocin, followed by 15 IU perfusion were also infused. Two living neonates were delivered (Apgar 9/10).

Ninety minutes after the delivery, a warning was given by the nursing staff due to patient´s weakness and pale skin. Close monitoring revealed both haemodynamic stability and neither external nor internal bleeding, which was confirmed by the obstetrician. No relevant clinical signs, besides prolonged capillary refill time (superior to three seconds), were encountered. Blood samples for haemogram, platelet count, thromboelastometry (ROTEM®, TEM GmbH, Munich, Germany) and arterial blood gases (ABG) were collected.

The ABG revealed haemoglobin 8.3 g/dL, arterial pH 7.39, arterial pCO_2 25 mmHg, arterial pO_2 182 mmHg, arterial bicarbonate 18 mmol/L, haemoglobin saturation 100%, ionic calcium 1.17 mg/dL, blood glucose 91 mg/dL and lactate 35 mg/dL. Once the patient's previous haemoglobin level was 11.2 g/dL, consideration was given to a possible underestimated blood loss during CS. One unit of packed red blood cells and 1 g of tranexamic acid were immediately infused. Invasive blood pressure was monitored in addition to continuous electrocardiogram, pulse oximetry and diuresis, despite the absence of bleeding. In less than 15 minutes, ROTEM® detected a massive coagulation disorder, which triggered our institution's Massive Bleeding Protocol activation (Fig. 1). Thromboelastometry subanalysis is presented in Table 1.

Based on ROTEM® analysis, the Immuno-Haemotherapy physician provided 1 platelet pool, 6 g of fibrinogen concentrate (Haemocomplettan®, CSL Behring, Marburg, Germany), 2500 IU of prothrombin complex concentrate (Octaplex®, Octapharma PP, Vienna, Austria) and 4 fresh frozen plasma units which were administered through two large-bore catheters (16 G). Another unit of packed red blood cells was supplied concomitantly with 20 mL of calcium gluconate 10%, and a six-hour infusion of tranexamic acid 1 g.

The patient maintained cardiovascular stability with no signs of haemorrhage during the event and the recovery phase. Final ROTEM®, collected 180 minutes after delivery, showed no relevant abnormalities and the ABG presented haemoglobin 8.0 g/dL and lactate 10 mg/dL (Fig. 2).

To ensure close surveillance, the patient remained 24 hours in the post-anaesthesia care unit, uneventfully. At day five after delivery, the puerpera was discharged clinically well, with two healthy newborns.

DISCUSSION

Coagulopathy represents a rare cause of PPH.[8] The aetiology of coagulopathy related to PPH encompasses primary coagulation disorder or secondary causes such as

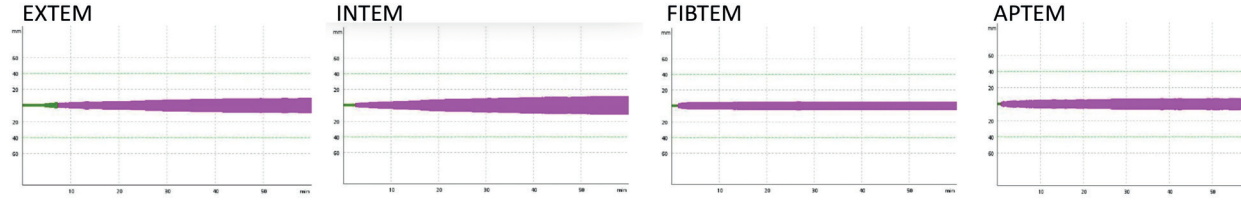

Figure 1 – Thromboelastometry (ROTEM®) 90 min after delivery - severe coagulation impairment with coagulation factors, fibrinogen and platelets absent.

Table 1 - Thromboelastometry (ROTEM®) analysis, 90 min and 180 min after delivery. Reference ranges, reported by Lange *et al*.[13]

Time after delivery (minutes)	Assays	CT (s)	CFT (s)	α angle (º)	A10 (mm)	MCF (mm)	ML (%)
90	EXTEM®	285 (34 - 66)	- (44 - 154)	- (63 - 81)	4 (44 - 73)	5 (55 - 78)	4 (0 - 44)
	INTEM®	152 (98 - 225)	- (37 - 118)	4 (67 - 82)	5 (46 - 73)	11 (48 - 78)	0 (0 - 15)
	FIBTEM®	77 (31 - 59)	-	- (65 - 83)	4 (12 - 44)	4 (12 - 42)	2 (0 - 10)
	APTEM®	55 (31 - 71)	- (47 - 158)	- (60 - 81)	**5** (43 - 72)	**5** (56 - 78)	8 (0 - 14)
180	EXTEM®	44 (34 - 66)	68 (44 - 154)	81 (63 - 81)	63 (44 - 73)	71 (55 - 78)	4 (0 - 44)
	INTEM®	112 (98 - 225)	60 (37 - 118)	78 (67 - 82)	63 (46 - 73)	72 (48 - 78)	4 (0 - 15)
	FIBTEM®	48 (31 - 59)	-	71 (65 - 83)	32 (12 - 44)	34 (12 - 42)	3 (0 - 10)
	APTEM®	48 (31 - 71)	63 (47 - 158)	81 (60 - 81)	64 (43 - 72)	72 (56 - 78)	6 (0 -14)

CT: clotting time; CFT: clot formation time; A10 amplitude at 10 minutes; MCF maximum clot firmness; ML maximum lysis; (-) not measured

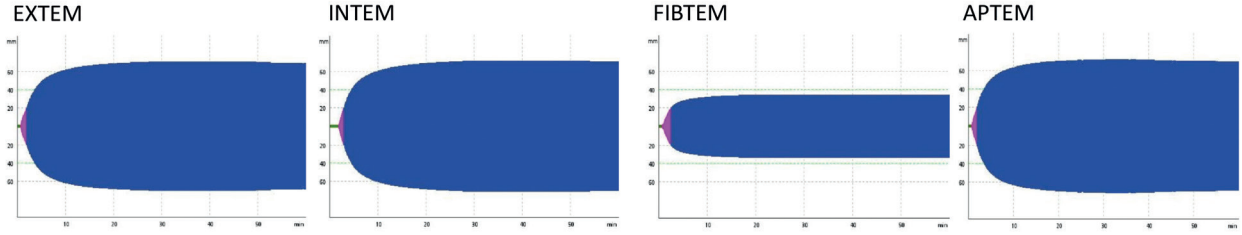

Figure 2 – Thromboelastometry (ROTEM®) 180 min after delivery - normal exam with coagulation pathway preserved.

dilution coagulopathy, localised or disseminated consumption of clotting factors or platelets and increased fibrinolysis.[9] Monitoring haemostatic impairment can be hard to accomplish and should rely on clinical observation, laboratory tests and point-of-care tests. Although no signs of bleeding or cardiovascular instability were observed in this case, clinical suspicions due to the presence of known PPH's risk factors, namely, CS after induced labour, prolonged labour and multiple pregnancy,[10,11] led us to request a ROTEM® test. Laboratory parameters associated with PPH[12] (Hb < 10 g/dL) were absent in the initial laboratory evaluation before labour induction, and no coagulation abnormalities were observed. Point-of-care tests, as ROTEM®, are gaining popularity because they assess the whole coagulation process in a quick and specific way. Peri-partum reference ranges for ROTEM®, reported by Lange *et al*,[13] were compared with initial and after transfusion thromboelastometry, 90 and 180 minutes after delivery, respectively (Table 1). A severe coagulation disorder was detected as results began to become available, only 15 minutes after the sample was sent. This information allowed us to intervene rapidly in the prevention of an imminent, massive haemorrhage. Had results taken longer to be available, bleeding would probably have occurred. Moreover, ROTEM® parameters provide scope for a guided transfusion, minimising the risks inherent to haemocomponents and haemoderivatives replacement. A pre-existing institutional Massive Bleeding Protocol, as well as a close collaboration and interdisciplinary communication, were the fulcra of the success achieved. In this case, an underestimated intrapartum blood loss was the cause of coagulopathy.

This unique case report of severe coagulopathy reflects how an early multidisciplinary approach to an obstetric emergency results in a positive outcome, avoiding the imminent, catastrophic haemorrhage. It also emphasises the relevance of both an accurate evaluation of total blood loss and the adoption of a patient-centred strategy, based on clinical judgment, prevailing in the first instance over a pre-existing diagnostic and therapeutic algorithm.

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PROTECTION OF HUMANS AND ANIMALS

The authors declare that the procedures were followed according to the regulations established by the Clinical Research and Ethics Committee and to the Helsinki Declaration of the World Medical Association.

DATA CONFIDENTIALITY

The authors declare having followed the protocols in use at their working center regarding patients' data publication.

PATIENT CONSENT

Obtained.

CONFLICTS OF INTEREST

All authors report no conflict of interest.

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