

SHORT REPORT

The use of recombinant factor VIIa in severe postpartum hemorrhage

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Severe postpartum hemorrhage (SPPH) from uterine bleeding and profuse hemorrhage of pelvic origin may lead to hemorrhagic shock, consumption coagulopathy and disseminated intravascular coagulopathy (DIC). These are life-threatening situations that require fast and efficient treatment, including contraction of the uterus, removal of the placenta, correction of coagulopathy, ligation of uterine or internal iliac arteries, hysterectomy or arterial embolization (1). Recombinant activated factor VII (rFVIIa) has been shown to correct severe coagulopathy and control life-threatening bleeding (2,3). The use of rFVIIa in obstetrics is also encouraging (4,5).

Materials and methods

Ten women with SPPH and bleeding were treated during 2000–2003 with rFVIIa. Coagulopathy was corrected with packed cells, fresh frozen plasma, cryoprecipitate and platelets. rFVIIa (NovoSeven[®], Novo Nordisk, A/S Bagsvaerd, Denmark) was administered intravenously at doses of 90–100 µg/kg (7.2–19 mg). The indication and timing were continuous bleeding, after hysterectomy or surgical hemostasis. The dosage used was the one effective in trauma (3).

Results

The results of the treatment are shown in Tables I and II.

Discussion

The use of rFVIIa with DIC was uneventful. The prophylactic use and the preferred time for injection are still unclear. One to two (up to 19 mg) injections were sufficient in our patients.

Conclusions

rFVIIa was successfully used as an additional treatment for severe postpartum and intra-abdominal hemorrhage even in the presence of DIC. In three patients, rFVIIa saved their lives. It significantly reduced the blood loss and enabled surgical hemostasis. rFVIIa is recommended when preservation of the uterus is required and when arterial embolization is not available. Dose and timing of administration need further elucidation.

References

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Table I. rFVIIa treatment and results

Case no.	Diagnosis	Transfusions before rFVIIa	DIC	rFVIIa dose	Surgical treatment	Additional surgeries	Transfusions post rFVIIa	Clinical effect
1	Placenta accreta	44PC, 24FFP, 54CRYO, 60PLT	+	90 µg/kg IV × 2 (19.2 mg)	Hysterectomy	Ligation of internal iliac + packing	6PC, 6FFP	Bleeding stopped
2	Ruptured uterus	20PC, 16FFP, 60CRYO, 60PLT	+	100 µg/kg IV (9.6 mg)	Hysterectomy	Ligation of internal iliac arteries	2PC, 4FFP, 4CRYO	Bleeding stopped
3	Uterine atony	14PC, 12FFP, 10CRYO, 10PLT	+	90 µg/kg IV	Cesarean section Packing of uterus	Laparotomy Packing of tears on liver	8PC, 4FFP, 3CRYO	Bleeding reduced not from liver
4	Uterine atony	12PC, 10FFD, 8CRYO	-	90 µg/kg IV	Subtotal hysterectomy	Ligation of internal iliac arteries	-	Bleeding stopped Sheehan
5	Uterine rupture	26PC, 16FFP, 60CRYO, 30PLT	+	90 µg/kg IV	Ligation of internal iliac arteries	Subtotal hysterectomy	-	Bleeding stopped ARDS
6	Placenta accreta	100PC, 50FFP, 50CRYO, 50PLT	+	90 µg/kg IV (7.2 mg)	Arterial embolization (+ lumbar artery)	Hysterectomy, iliac ligation, 4 laparotomies + packing	14PC, 4FFP, 4CRYO, 6PLT	Bleeding controlled
7	Uterine rupture	10PC, 6FFP, 4CRYO	-	90 µg/kg IV	Hysterectomy	Ligation of internal iliac arteries + packing	-	Bleeding reduced
8	Uterus myomatosus menorrhagia	6PC, 9FFP	-	60 µg/kg IV	Hysterectomy	None	-	No bleeding
9	Ruptured uterus	15PC, 6FFP, 30CRYO, 15PLT	+	90 µg/kg IV	Revision hysterectomy	None	-	Bleeding stopped
10	Placenta accreta	27PC, 30FFP, 30CRYO, 10PLT	+	90 µg/kg IV	Hysterectomy	Aortic clamp Ligation of internal iliac arteries	2PC	Bleeding stopped

PC, packed cells; FFP, fresh frozen plasma; CRYO, cryoprecipitates, PLT, platelets; acute respiratory distress syndrome.

Table II. Laboratory tests before and after rFVIIa (ranges) in 10 patients

	Normal range	Before rFVIIa	After rFVIIa
Hemoglobin (g/dl)	12–14	4.5–11	8–10
Hematocrit (%)	37–47	15–33	21–34
Platelets ($\times 10^9/l$)	175–400	31–125	50–408
International normalized ratio (INR)	< 1	1.6–4.5	0.5–1.3
Prothrombin time (s)	10.7–13	10–12	9–11
Activated partial thromboplastin time (aPTT) (s)	18–30	36–180	30–60
Fibrinogen (mg/dl)	250–400	62–180	128–205
Di-dimer (μ/ml)	< 0.5	2–32	0.5–1

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