Available online at www.sciencedirect.com
www.jdds.org

ScienceDirect

Journal of Dermatology & Dermatologic Surgery xxx (2016) xxx–xxx

Neonatal purpura fulminans in newborn with severe congenital protein C deficiency: Case report

Sultan A. Jafarri [a], Khalid M. AlAttas [a,*], Sultan M. Bajawi [a], Mohammad K. Ahsan [a], Ali M. Al-Sheikh [a], Mohammed A. Buraik [a,b], Amr Mohammed Gamal [a], Nadia S. Mustafa [a]

[a] *Department of Dermatology, King Fahad Central Hospital, Jizan, Saudi Arabia*
[b] *Department of Pathology, King Fahad Central Hospital, Jizan, Saudi Arabia*

Received 27 August 2016; accepted 1 October 2016

Abstract

Neonatal purpura fulminans (PF) is a rare, life-threatening condition, caused by congenital or acquired deficiencies of protein C or S. PF describes a clinico-pathological entity of dermal microvascular thrombosis associated with disseminated intravascular coagulation (DIC) and perivascular hemorrhage occurring in the newborn period. Here we describe a newborn with PF due to severe congenital protein C deficiency. The lesions started 5 h after birth but the infant was brought to our emergency department 20 h later. The infant was admitted in neonatal intensive care unit (NICU) and treated with fresh frozen plasma (FFP), enoxaparin along with other supportive cares. In spite of impressive improvement of skin lesions, coordination with numerous subspecialties and aggressive NICU support, the infant died one month after admission due to multiorgan failure and septicaemia.

Keywords: Neonatal; Purpura fulminans; Congenital; Protein C deficiency

1. Introduction

Protein C is one of the major inhibitors of the coagulation system, which has an important influence on the physiological function of hemostasis to ensure patency of the microcirculation (Stenflo, 1976). Activated protein C specifically inhibits factor (F) Va and F VIIIa which in turn down regulates thrombin generation. Protein C deficiency leads to macro- and micro vascular thrombosis (Andrew et al., 1987). The protein C pathway is illustrated in (Fig. 1). Hereditary (congenital) protein C deficiency is rare, leads to a hypercoagulability state that usually presents at birth with PF and/or severe venous and arterial thrombosis. PF due to congenital protein C deficiency usually presents with a rapid onset of cutaneous purpuric lesions that start few hours to 5 days after birth (Bolognia et al., 2008). The first reports on such a state were published in 1983 (Branson et al., 1983). Acquired protein C deficiency can occur in several other diseases (Esmon, 2001). Sepsis and severe infections especially gram-negative organisms and Staphylococcus species are the most common causes of the acquired type (Gurses and Ozkan, 1988). Here we describe a rare congenital protein C deficiency condition presented with a rapid onset of cutaneous purpuric lesions after birth.

* Corresponding author.
E-mail address: alattas101khalid@yahoo.com (K.M. AlAttas).
Peer review under responsibility of King Saud University.

Production and hosting by Elsevier

http://dx.doi.org/10.1016/j.jdds.2016.10.001

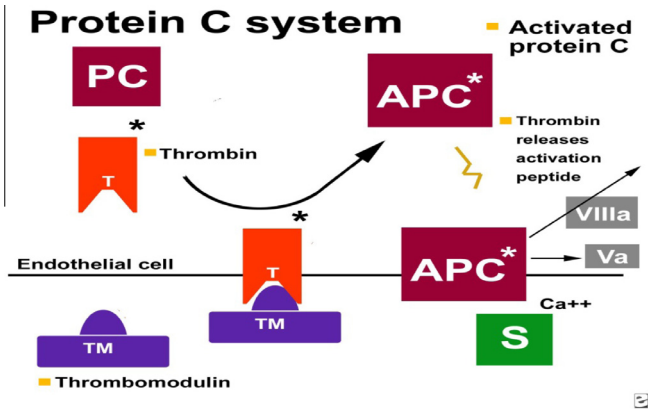

Figure 1. The protein C pathway. APC = activated protein C; PC = protein C; S = protein S; T = thrombin; TM = thrombomodulin; Va = factor Va; VIII = factor VIIIa. *Courtesy*, http://emedicine.medscape.com/.

2. Case report

A newborn Yemeni full-term female delivered by normal spontaneous vaginal delivery at home. Within 5 h after birth, her parents noticed a change in her skin which continued to increase. They brought her to our emergency department 20 h later. We observed retiform ecchymotic plaques with erythematous border over scalp, both cheeks, left hand and right sole. Rapidly, in less than 24 h the lesions increased to involve left arm (see Figs. 2 and 3) and became necrotic, indurated with sharp borders (see Fig. 4). New lesions continued to appear on the other parts of the body. There was a history of consanguineous parents. She was the fifth child of her mother having two healthy siblings. But other last two siblings died at home due to the same complication on the first week of their life without chance of visiting any hospital.

Laboratory values were: Hct = 24.6% (normal 37–47%); WBC count = 22.9 × 10^9/L; platelet count = 168 × 10^9/L; PT = 22.27 s (11–15 s); PTT 61.866 s (25–35 s); FDP > 20 mcg/ml (normal up to 5); D-dimer 35.13 μg/ml (normal 0–0.5 μg/ml); Fibrinogen = 90 μg/L (normal:180–350 μg/L); protein C 8%, very low (normal 70–140%); Protein S 103% (normal 70–140%); antithrombin III 64% (normal 75–125%) and factor × 106% (normal 70–120 %). Other laboratory tests including serum electrolytes, renal functions, liver functions, urine and CSF analysis were in normal ranges. Several blood, urine and CSF cultures did not show any growth.

Regarding the family history, clinical, laboratory findings, severely low protein C and rule out of infectious causes, we established a diagnosis of PF due to severe congenital protein C deficiency. The baby was admitted in

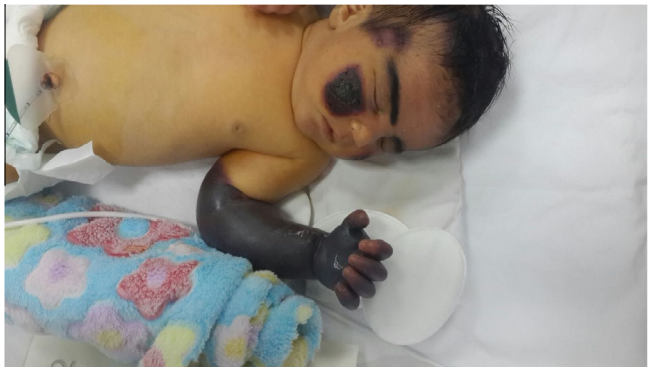

Figure 2. Showing multiple well defined blackish patches and plaques involved left arm, both cheeks and feet.

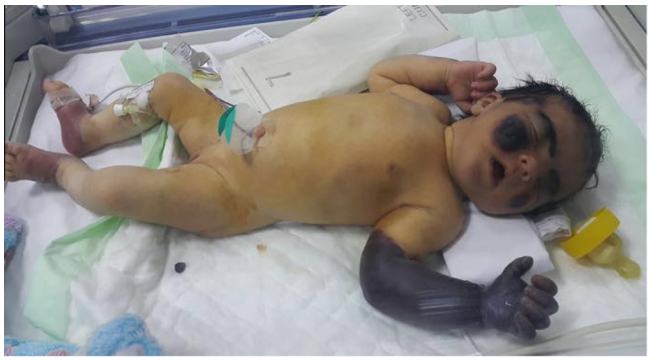

Figure 3. Showing multiple well defined blackish patches and plaques involved left arm, both cheeks and feet.

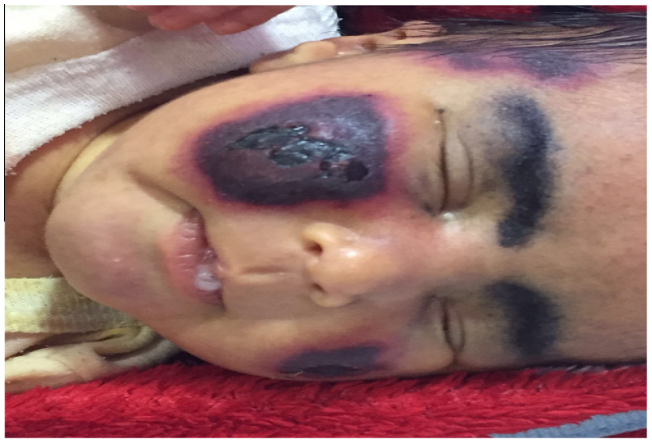

Figure 4. Showing the lesions became necrotic with erythematous retiform borders.

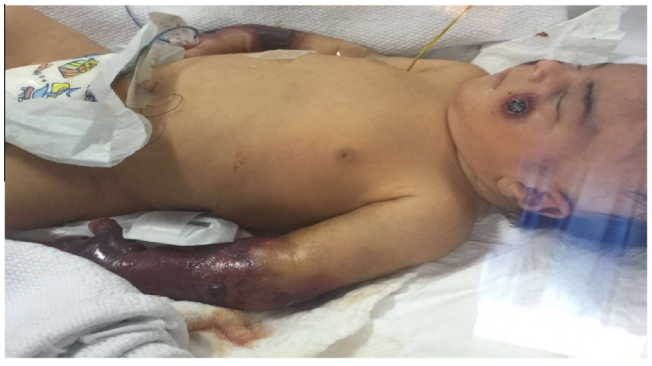

Figure 5. Showing improvement after 1 week of therapy.

Please cite this article in press as: Jafarri, S.A. et al., Neonatal purpura fulminans in newborn with severe congenital protein C deficiency: Case report, Journal of Dermatology & Dermatologic Surgery (2016), http://dx.doi.org/10.1016/j.jdds.2016.10.001

Figure 6. Showing improvement after 2 weeks of therapy.

NICU under care of pediatric hematologist and treated with broad spectrum antibiotics prophylactically, enoxaparin S/C and FFP transfusions. After several days of therapy, the necrotic lesions healed up dramatically (see Figs. 5 and 6) including normalization of PT, PTT. Despite early diagnosis and prompt management, the infant got nosocomial infection. The wound swab showed growth of Klebsilla Pneumoniae and Candida in blood culture. Subsequently, she died due to multi-organ failure, septicemia and intracranial hemorrhage.

3. Discussion

Protein C deficiency predisposes to reduce thrombin generation and a hypercoagulable state (Price et al., 2011). In our patient, PF started five hours after birth in comparison to another case report from Riyadh (AlBarrak and Al-Matary, 2013) in which the lesions started at 43 h after birth. That was due to bacterial infection by group B Streptococcus (GBS) shown in CSF& blood cultures, but protein C and S were normal. Acquired causes of PF are mainly due to severe infections of which the most commonly associated pathogen in the neonatal period is GBS (Issacman et al., 1984; Zenciroglu et al., 2010). In our patient multiple cultures were negative, protein C (8%) was very low (normal 70–140%) and Protein S was normal. It confirmed that the cause was congenital deficiency of protein C. Referring to management of our patient, FFP was transfused to correct the deficiency of protein C. Unfortunately, concentrated protein C was not available in our hospital.

In (Reza Saeidi et al., 2014), there were no family history of a similar case but a history of consanguineous marriage. Comparing to our patient, there was consanguinity of marriage and two siblings died before by the same presentation. Unfortunately, the siblings were undiagnosed.

Dermatologists should be aware of this disease since congenital protein C deficiency is a fatal condition and skin involvement is frequently an early manifestation of the disease process. The patient should be screened for congenital and acquired causes. There is a necessity of multidisciplinary approach for better management of this fatal disease.

Conflict of interest

None.

References

AlBarrak, M., Al-Matary, A., 2013. Neonatal purpura fulminans manifestation in early-onset group B Streptococcal infection. Am. J. Case Rep. 14, 315–317. http://dx.doi.org/10.12659/AJCR.889352.

Andrew, M., Paes, B., Milner, R., et al., 1987. Development of the human coagulation system in the full-term infant. Blood 70, 165–172.

Bolognia, J.L., Jorizzo, J.L., Rapini, R.P., 2008. Dermatology, second ed. Elsevier, Mosby, pp. 384–385.

Branson, H.E., Katz, J., Marble, R., Griffin, J.H., 1983. Inherited protein C deficiency and coumarin-responsive chronic relapsing purpura fulminans in a newborn infant. Lancet 2 (8360), 1165–1168.

Esmon, C.T., 2001. Role of coagulation inhibitors in inflammation. Thromb. Haemost. 86, 51–56.

Gurses, N., Ozkan, A., 1988. Neonatal and childhood purpura fulminans: review of seven cases. Cutis 41, 361–363.

Issacman, S.H., Heroman, W.M., Lightsey, A.L., 1984. Purpura fulminans following late onset Group B beta-hemolytic streptococcal sepsis. Am. J. Dis. Child. 138, 915–916.

Price, V.E., Ledingham, D.L., Krumpel, A., Chan, A.K., 2011. Diagnosis and management of neonatal purpura fulminans. Semin. Fetal Neonatal Med. 16, 318–322.

Saeidi, Reza, Gharaee, Reza, Nobakht, Zohreh, 2014. Neonatal purpura fulminans. Iran. J. Neonatol. 5 (1), 34–37.

Stenflo, J., 1976. A new vitamin K-dependent protein. Purification from bovine plasma and preliminary characterization. J. Biol. Chem. 251, 355–363.

Zenciroglu, A., Karagol, B.S., Ipek, M.S., Okumus, N., Yarali, N., Aydin, M., 2010. Neonatal purpura fulminans secondary to group B streptococcal infection. Pediatr. Hematol. Oncol. 27, 620–625.

Please cite this article in press as: Jafarri, S.A. et al., Neonatal purpura fulminans in newborn with severe congenital protein C deficiency: Case report, Journal of Dermatology & Dermatologic Surgery (2016), http://dx.doi.org/10.1016/j.jdds.2016.10.001