Table 1. Clinical and laboratory data of 12 pregnant women with ITP and those of fetuses/neonates monitored by PUBS.

Pt.	PUBS (week)	Maternal Plt count (10^9/L)	Fetal Plt count (10^9/L)	Neonatal Plt count (10^9/L)	Maternal therapy	Mode of delivery	Bone aspirate	Anti-Plt Ab PaIgG/ SBIgG
1	39	83	210	238	C	Spon	Yes	-/-
2	36	20	15	54	C, Ig	Cs 37	Yes	+/+
3	38	88	48	33	/	Cs 38	Yes	+/+
4	39	73	376	300	/	Spon	Yes	-/+
5	38	56	60	100	C	Spon	Yes	-/+
6	38	81	282	243	C	Spon	Yes	-/+
7	38	80	268	231	C	Spon	Yes	-/+
8	39	66	203	257	C, Ig	Spon	Yes	+/+
9	38	76	47	52	C	Cs 39	Yes	+/+
10	35	29	245	210	C	Spon	Yes	+/+
11	39	44	230	205	C	Spon	Yes	+/+
12	38	45	130	110	C	Spon	Yes	-/-
Median		69.5	206	207				
Range		20-88	15-376	33-300				

Abbreviations: C = corticosteroids; Ig = high dose immunoglobulin; Cs = Cæsarean section; Spon = spontaneous full-term delivery.

days. The three severely thrombocytopenic neonates did not manifest a hemorrhagic syndrome and spontaneously recovered a normal platelet count within 2 weeks. Occasional fetal morbidity or mortality from hemorrhagic complications of ITP during pregnancy encourage some authors to favor the use of PUBS.[7, 10] Other authors argue that the risks associated with PUBS are greater[2,4] and recommend determining the route of delivery by maternal obstetric indications.

Our encouraging experience provides further evidence that in skilled hands PUBS may be useful in the management of pregnant women with ITP, providing a safe way to guide the mode, site and time of delivery.

Key words

Immune thrombocytopenic purpura, pregnancy, percutaneous umbilical blood sampling

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References

1. Burrows RF, Kelton JG. Fetal thrombocytopenia and its relation to maternal thrombocytopenia. N Engl J Med 1993; 329:1463-6.
2. Crowther MA, Burrows RF, Ginsberg J, Kelton JG. Thrombocytopenia in pregnancy: diagnosis, pathogenesis and management. Blood Rev 1996;10:8-16.
3. George JN, El Harake MA, Raskob GE. Chronic idiopathic thrombocytopenic purpura. N Engl J Med 1994; 331:1207-11.
4. Lourenço DM, Santana RM, Vignal C. Pregnancy in patients with immune thrombocytopenic purpura. Haematologica 1997; 82:383.
5. Bussel JB, Druzin ML, Cines DB, Samuels P. Thrombocytopenia in pregnancy. Lancet 1991; 337:251.
6. Yamada H, Fujimoto S. Perinatal management of idiopathic thrombocytopenic purpura in pregnancy: risk factors for passive immune thrombocytopenia. Ann Hematol 1994; 68:39-42.
7. Scioscia A, Grannum AT, Copel J, Hobbins J. The use of percutaneous umbilical blood sampling in immune thrombocytopenic purpura. Am J Obstet Gynecol 1988; 159:1066-8.
8. Ghidini A, Sepulveda W, Lockwood CJ, Romero R. Complications of fetal blood sampling. Am J Obstet Gynecol 1993; 168:1339-44.
9. McMillan R. Chronic idiopathic thrombocytopenic purpura. N Engl J Med 1981; 304:1135-47.
10. Garmel S, Craigo S, Morin L, Crowley J, D'Alton M. The role of percutaneous umbilical blood sampling in the management of immune thrombocytopenic purpura. Prenatal Diagnosis 1995; 15:439-45.

Adenovirus pneumonitis successfully treated with intravenous ribavirin

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Adenovirus infections are a frequent cause of severe complications in the post allogeneic bone marrow transplantation period, and to date, no established form of treatment exists. We report the case of an autologous bone marrow transplant recipient who developed adenovirus pneumonitis which was successfully treated with intravenous ribavirin.

Since conditioning regimens largely ablate virus specific immunity, there may be a reactivation of latent viruses such as adenovirus. The incidence of adenovirus infection in BMT recipients, according to the largest published review was 5%[1] although it may be as high as 18 % in the pediatric population, in second place after herpes simplex.[2] When disseminated adenovirus infection occurs, it mainly affects the urinary tract, liver, gut and lungs, and can prove fatal in half the cases.

Adenovirus is more common after an allogeneic transplant, and a significant relationship between post-transplant adenovirus infection and the occurrence of acute graft-versus-host disease has been described.[1] We present the case of a patient who developed adenovirus pneumonitis after undergoing an autologous BMT, and who was successfully treated with intravenous ribavirin.

A 43-year-old man with acute myeloid leukemia in first remission underwent autologous BMT using TBI (13.2 Gy) and CY 60 mg/kg two day conditioning. On day 0, 300 cc of autologous bone marrow was infused with CMN 2.17×10^8/kg and CFU-GM 4.34×10^4/kg. On day +20, after persistent fever without an identifiable focus treated with imipenem-teicoplanine-amphotericin B, he developed a persistent non-productive cough, dyspnea, hypoxemia, a

worsening in his general condition, as well as painful hepatomegaly. Analysis showed bilirubin 3.7 mg/dL (normal values up to 1) LDH 638 U/L (normal values up to 460); chest X-ray revealed diffuse alveolar-interstitial infiltrates. The BAL performed ruled out *Pneumocystis carinii*, HSV, RSV, CMV, Legionella, BARR or fungal infection. The echocardiogram showed no abnormalities. Saline restriction measures were taken and diuresis was stimulated but the patient's condition did not improve.

On day +28 he was transferred to the intensive care unit. One day later, adenovirus was isolated in BAL, so i.v ribavirin was administered along with assisted ventilation; 48 hours later the fever disappeared and a marked improvement was observed in breathing and liver function. Total resolution occurred on day +37. The ribavirin dosage administered was 15 mg/Kg every 6 hours for 8 days. A further BAL was carried out on day +46 which was negative for adenovirus. The leukocytic graft reached 1,000 leukocytes with 500 granulocytes on day +29, fell to 200 on day +36 which required G-CSF and remained at < 500 granulocytes up to day +48.

Although adenovirus may remain present in tonsillar and other lymphoid tissue for prolonged periods, if isolated from a BAL done under optimal conditions in which no other pathogens can be found, this can be considered diagnostic of acute adenovirus. To date, the efficacy of intravenous ribavirin has been demonstrated in adenovirus infections such as cystitis,[3-5] nephritis,[6] gastroenteritis,[7] pneumonitis,[8] and disseminated adenovirus infection.[9] The dosage employed by most authors varied between 15 and 30 mg/kg/d divided in three doses. In our case, following Wulffraat *et al.*,[8] we administered a dosage of 15 mg/kg/6 h (a total dosage of 60 mg/kg/d), which led to rapid clinical improvement and clearance of adenovirus infection. This did, however, have a negative affect on the leukocytic graft which, fortunately, was reversible. The hematologic effects of ribavirin have been investigated in Rhesus monkeys. Mild normocytic anemia or severe anemia occurred when ribavirin was administered at dosages of up to 30 or 50 mg/kg/day, respectively; however, no significant effects were observed on white blood cells.[10]

Like other authors, we consider that intravenous ribavirin is an effective treatment for adenovirus infection, but believe it is necessary to determine the exact dosage at which toxic effects are avoided but efficacy is maintained.

Key words

Autologous bone marrow transplantation, adenovirus pneumonitis, ribavirin

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References

1. Shields AF, Hackman RC, Fife KH, Corey L, Meyers JD. Adenovirus infection in patients undergoing bone marrow transplantation. N Engl J Med 1985; 312:529.
2. Wasserman R, August CS, Plotkin SA. Viral infections in pediatric bone marrow transplant patients. Pediatr Infect Dis J 1988; 7:109.
3. Cassano WF. Intravenous ribavirin therapy for adenovirus cystitis after allogeneic bone marrow transplantation. Bone Marrow Transplant 1991; 7:247.
4. Murphy GF, Wood DP, McRoberts JW, Hensleee-Downey PJ. Adenovirus-associated hemorrhagic cystitis treated with intravenous ribavirin. J Urol 1993; 149:565.
5. Jurado M, Navarro JM, Hernández J, Molina MA, De Pablos JM. Adenovirus associated haemorrhagic cystitis after bone marrow transplantation successfully treated with intravenous ribavirin [letter]. Bone Marrow Transplant 1995; 15:651.
6. Liles WC, Cushing H, Holt S, Bryan C, Hackman RC. Severe adenoviral nephritis following bone marrow transplantation: successful treatment with intravenous ribavirin. Bone Marrow Transplant 1993; 12:409.
7. Kapelushnik J, Or R, Delukina M, Nagler A, Livni N, Engelhard D. Intravenous ribavirin therapy for adenovirus gastroenteritis after bone marrow transplantation. J Pediatr Gastroenterol Nutr 1995; 21:110.
8. Wulffraat N, Geelen S, van Dijken P, Graeff-Meeder B, Kuis W, Boven K. Recovery from adenovirus pneumonia in a severe combined immunodeficiency patient treated with intravenous ribavirin [letter]. Transplantation 1995; 59:927.
9. Mc Carthy AJ, Bergin M, De Silva LM, Stevens M. Intravenous ribavirin therapy for disseminated adenovirus infection. Pediatr Infect Dis J 1995; 14:1003-4.
10. Canonico PG, Kastello MD, Cosgriff TM, et al. Hematological and bone marrow effects of ribavirin in Rhesus monkeys. Toxicol Appl Pharmacol 1984; 74:163.

Portal and mesenteric venous thrombosis in a patient heterozygous for the 20210 A allele of the prothrombin gene

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We give the first description of portal and mesenteric venous thrombosis associated with the 20210 A allele of the prothrombin gene in a 48-year-old woman after splenectomy.

Recently, the 20210 A mutation of the prothrombin gene has been described in patients who have had venous thromboses in unusual sites, such as the superior sagittal sinus and in the Budd-Chiari syndrome.[1,2] Mesenteric thrombosis in patients with idiopathic thrombocytopenic purpura (ITP) undergoing splenectomy is uncommon. The usually transient post-splenectomy thrombocytosis has a not well defined effect on the development of thromboembolism.