could have implications for search-and-rescue teams, medical emergency teams, and other hazard profession staff.
Keywords: certification; medical staff; phsycho-physiological; training
Prehosp Disast Med 2010;25(5):s100–s101

Seven Day Storage at 4°C of Previously -80°C Frozen AB Plasma

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Background: The Netherlands military mainly uses deep frozen (-80°C) blood products to support operational medical care. Thawed red cells can be stored for 14 days at 4°C, and are directly available for transfusion, whereas -80°C (refrozen from thawed -30°C) AB FFP must be thawed first for 30–40 min. The possibility of extending the shelf life of this thawed plasma to make both products directly available for damage control resuscitation in trauma patients with (massive) blood loss was studied.
Methods: Apheresis leukodepleted AB plasma (n = 42) were frozen at -30°C, quarantined, and released after repeated donor testing. On average, units contain 296 ±14 ml of plasma and have been stored at -30°C for 316 ±20 days. The units were thawed in a water bath at 37°C (Type 2032, Forma Scientific) repacked, frozen, and stored as deep frozen plasma (DFP) at -80°C for 20–40 days, before the final thawing procedure. Each day, before sampling, the units were inspected visually. Samples were drawn into sample pouches using sterile techniques, after thawing from -30°C (Day minus 1), from -80°C (Day 0), and after storage for 5, 7, and 14 days at 4°C respectively. Samples were immediately processed and APTT, PT, INR, fibrinogen, FV, FVII and FVIII were measured within 4 hours, using an automated coagulation analyzer (Destiny Amelung plus, Trinity Biotech).
Results: Apart from a slight prolongation of the APTT, no significant changes were observed when plasma was refrozen and thawed from -80°C. During subsequent storage at 4°C, only the activity of FVII remained stable. Fibrinogen decreased after 14 days of storage, whereas Factor V and VIII decreased after only 5 days of storage. There was no significant difference between 5 or 7 days 4°C stored units. The appearance of the majority of the thawed DFP units changed after 7–14 days storage at 4°C from clear into more turbid solutions, and sometimes even with clots.
Conclusions: All units contained more than 50 IU/dL FV, FVII, FVIII on Day 7 and had a normal APTT, PT, INR and fibrinogen concentration. In May 2009, a maximum storage time of seven days at 4°C of -80°C refrozen AB plasma was implemented, making this thawed plasma readily available together with thawed red cells for damage control resuscitation in combat casualties.
Keywords: blood products; frozen AB plasma; storage; thawed plasma
Prehosp Disast Med 2010;25(5):s101

-80°C Red Cells Plasma and Platelets in Combat Casualty Care

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Background: Since 2004, the Netherlands military mainly uses -80°C frozen blood products to cover operational needs. The experiences with these products based on data collected from two NLD blood bank facilities in Afghanistan during the past 33 months are described in this study.
Methods: Apheresis leukodepleted group O platelets in 5% DMSO/plasma are frozen as a concentrate (±15ml) at -80°C. After thawing, the platelets are resuspended in thawed AB plasma, to be used within six hours. Apheresis leukodepleted AB plasma is thawed from -30°C, repacked and frozen to -80°C before the final thawing procedure. Red cells from leukodepleted group O whole blood are frozen at -80°C in 40% (w/v) glycerol. After thawing and deglycerolization, the red cells are stored for no longer than 14 days at 4°C in AS3, before use. All thawed (and washed) products are in compliance with international regulations and guidelines.

All frozen products are produced in the Netherlands, shipped at -80°C (dry ice), stored in theater at -80°C, thawed on demand (all products) or for liquid storage (red cells). Occasionally, standard liquid red cells are sent from the Netherlands as a supplement, to cover periods of (expected) higher usage.
Results: During the past 33 months, 533 patients (85% Afghan) were transfused with 533 units of standard liquid red cells and 3,380 frozen blood products (1,360 red cell units, 1,425 plasma units and 595 apheresis platelet units). On one location, where all blood products were provided by the Netherlands Military Blood Bank, blood usage and survival were further analyzed. It showed that >90% of the transfused patients were trauma victims, of which, 14% (30 out of 209) required >10 red cell units within 24 hours. In these massively transfused patients, survival improved from 44% (n = 16) to 85% (n =14) after the introduction of a new transfusion policy in November 2007 (1:1 red cell to plasma ratio, with or without platelets). No shortages or transfusion reactions were reported.
Conclusions: Fully tested, frozen blood products, readily available after thawing, proved to be an effective and safe blood support for combat casualty care. A 1:1 red cell to plasma ratio appeared to increase survival in MT patients, also when only -80°C frozen blood products were used.
Keywords: combat casualty care; frozen blood products; storage; thawing
Prehosp Disast Med 2010;25(5):s101

Establishment of NATO Trauma Registry—A Joint Project within the NAT Framework

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In 2004, the Human Factors and Medicine (HFM) panel of the NATO research and technology organization (RTO) arranged a symposium on combat casualty care in order to address the problem of combat injuries in joint operations. The symposium was held together with the American yearly