Use of leucocyte-depleted platelet concentrates reduces the incidence of transfusion reactions and of HLA sensitisation. Platelet concentrates prepared from Rh(D)-positive donors should generally not be given to Rh(D)-negative women of child-bearing potential. Ideally platelet concentrates should also be ABO-compatible with the recipient.

ABO compatibility. Platelets express the ABO blood group antigens and the plasma component of platelet concentrates may contain alloantibodies from the donor (see Blood Groups, p.1057). Ideally, ABO-identical platelet concentrates should be used, but ABO-compatible concentrates are often used and incompatible concentrates may be used in an emergency. However, the use of ABO-mismatched platelets can reduce the efficacy of the platelet transfusion. Also, acute haemolytic reactions can occur after infusion of mismatched platelets if the infused plasma contains high antibody titres or the volume of plasma infused is large. Some have suggested that screening donors for high antibody titres should be routine in order to avoid this, but there is no consensus as to the definition of critical titre. There have been mixed reports on whether the use of ABO-mismatched platelets has an effect on the recipient's long-term clinical course.

Reviews.

1. Lozano M, Cid J. The clinical implications of platelet transfusions associated with ABO or Rh(D) incompatibility. *Transfus Med Rev* 2003; **17:** 57–68.

HLA antibodies. Platelets obtained from single donors have been used in patients receiving multiple transfusions of platelet concentrates to reduce the formation of antibodies to HLA. Some practitioners suggest[1] that patients who are likely to need long-term platelet support should be typed for HLA A and B antigens and screened for HLA antibodies. Leucocyte-depleted platelets and UVB-irradiated platelets have also been tried. A study[2] in 530 patients found that the incidence of platelet refractoriness was reduced from 13% of those patients receiving pooled platelet concentrates to 3% and 5% of those receiving leucocyte-depleted and UVB-irradiated platelets, respectively. A meta-analysis[3] of this and earlier small studies also concluded that leucocyte depletion reduced the risk of alloimmunisation and platelet refractoriness. Some guidelines[4] have nonetheless considered that there is no convincing evidence of clinical benefit from routine use.

1. Dan ME, Schiffer CA. Strategies for managing refractoriness to platelet transfusions. *Curr Hematol Rep* 2003; **2:** 158–64.
2. The Trial to Reduce Alloimmunization to Platelets Study Group. Leukocyte reduction and ultraviolet B irradiation of platelets to prevent alloimmunization and refractoriness to platelet transfusions. *N Engl J Med* 1997; **337:** 1861–9.
3. Vamvakas EC. Meta-analysis of randomized controlled trials of the efficacy of white cell reduction in preventing HLA-alloimmunization and refractoriness to random-donor platelet transfusions. *Transfus Med Rev* 1998; **12:** 258–70.
4. British Committee for Standards in Haematology, Blood Transfusion Task Force. Guidelines on the clinical use of leucocyte-depleted blood components. *Transfus Med* 1998; **8:** 59–71. Also available at: http://www.bcshguidelines.com/pdf/trans129.pdf (accessed 27/10/05)

Uses and Administration

Blood platelets assist in the haemostatic process (p.1045) by aggregating to form a platelet thrombus, and by releasing factors involved in initiating coagulation.

Transfusions of platelet concentrates are given to patients with thrombocytopenic haemorrhage (see p.1051). They are also given prophylactically to reduce the frequency of haemorrhage in thrombocytopenia associated with the chemotherapy of neoplastic disease (see p.640).

◊ References.

1. Fresh-frozen Plasma, Cryoprecipitate, and Platelets Administration Practice Guidelines Development Task Force of the College of American Pathologists. Practice parameter for the use of fresh-frozen plasma, cryoprecipitate, and platelets. *JAMA* 1994; **271:** 777–81.
2. Brozović B, *et al.* Platelet and granulocyte transfusions. In: Contreras M, ed. *ABC of transfusion.* 3rd ed. London: BMJ Books, 1998: 17–22.
3. Schiffer CA, *et al.* Platelet transfusion for patients with cancer: clinical practice guidelines of the American Society of Clinical Oncology. *J Clin Oncol* 2001; **19:** 1519–38. Also available at: http://www.jco.org/cgi/reprint/19/5/1519.pdf (accessed 27/10/05)
4. British Committee for Standards in Haematology, Blood Transfusion Task Force. Guidelines for the use of platelet transfusions. *Br J Haematol* 2003; **122:** 10–23. Also available at: http://www.bcshguidelines.com/pdf/platelettrans040703.pdf (accessed 27/10/05)
5. Heal JM, Blumberg N. Optimizing platelet transfusion therapy. *Blood Rev* 2004; **18:** 149–65.
6. Stroncek DF, Rebulla P. Platelet transfusions. *Lancet* 2007; **370:** 427–38.

Preparations

USP 31: Platelet Concentrate; Platelets.

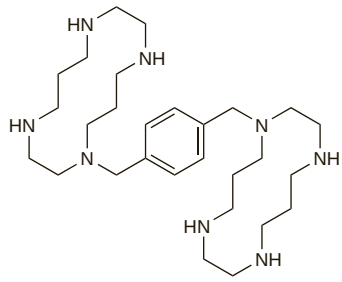
Plerixafor *(USAN, rINN)*

AMD-3100; JM-3100; Plérixafor; Plerixaforum; SDZ-SID-791; SID-791. 1,1′-(1,4-Phenylenebismethylene)bis(1,4,8,11-tetraazacyclotetradecane).

Плериксафор

$C_{28}H_{54}N_8$ = 502.8.

CAS — 110078-46-1 (plerixafor); 155148-31-5 (plerixafor hydrochloride).



Profile

Plerixafor is a CXCR4 receptor antagonist. It is under investigation for the mobilisation of haematopoietic stem cells for collection and subsequent autologous or allogeneic transplantation.

Policresulen *(rINN)*

Acidum Metacresolsulfonicum c. Formaldehydo; *m*-Cresolsulphonic acid-formaldehyde condensation product; Dicresulene polymer; Dihydroxydimethyldiphenylmethanedisulphonic acid polymer; Formaldehydhaltig Metakresolsulfonsyra; Formaldehydipitoinen Metakresolisulfonihappo; Metacresolsulfonic Acid-Formaldehyde; Metacresolsulphonic Acid-Formaldehyde; Methylenebis(hydroxytoluenesulphonic acid) polymer; Policrésulène; Policresuleno; Policresulenum; Polikresuleeni; Polikresulen; Polímero de dicresuleno; Polycresolsulfonate. α-(4-Hydroxy-2-methyl-5-sulfobenzyl)-ω-(4-hydroxy-5-sulfo-*o*-tolyl)poly[(4-hydroxy-2-methyl-5-sulfo-*m*-phenylene)methylene]; 2-Hydroxy-*p*-toluenesulfonic acid, polymer with formaldehyde.

Поликрезулен

$(C_8H_9O_4S)(C_8H_8O_4S)_n(C_7H_7O_4S)$.

CAS — 9011-02-3; 101418-00-2.

ATC — D08AE02; G01AX03.

ATC Vet — QD08AE02; QG01AX03; QG51AD02.

Profile

Policresulen is used as a topical haemostatic and antiseptic. It is also used similarly in veterinary medicine.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Albocresil; ***Braz.:*** Albocresil; ***Chile:*** Albocresil†; ***Cz.:*** Vagothyl; ***Fr.:*** Negatol†; ***Ger.:*** Albothyl; ***Hong Kong:*** Albothyl; ***Hung.:*** Vagothyl; ***Indon.:*** Albothyl; ***Ital.:*** Emaftol; Negatol; ***Malaysia:*** Albothyl; ***Mex.:*** Albothyl; ***Philipp.:*** Albothyl; ***Pol.:*** Albothyl; Vagothyl; ***Port.:*** Nelex; ***Rus.:*** Vagothyl (Ваготил); ***S.Afr.:*** Nelex†; ***Singapore:*** Albothyl; ***Switz.:*** Negatol; Negatol Dental.

Multi-ingredient: ***Arg.:*** Proctyl; ***Braz.:*** Proctyl; ***Cz.:*** Faktu; ***Fin.:*** Faktu†; ***Ger.:*** Faktu; ***Hong Kong:*** Faktu; ***Indon.:*** Faktu; ***Mex.:*** Proctoacid; ***Philipp.:*** Faktu; ***Port.:*** Faktu; ***Singapore:*** Faktu†; ***Switz.:*** Faktu.

Polygeline *(BAN, pINN)* ⊗

Poligelina; Polygéline; Polygelinum.

Полигелин

CAS — 9015-56-9.

ATC — B05AA10.

Description. Polygeline is a polymer prepared by cross-linking polypeptides derived from denatured gelatin with a di-isocyanate to form urea bridges.

Incompatibility. Intravenous preparations of polygeline contain calcium ions and are incompatible with citrated blood.

Adverse Effects

As for Gelatin, p.1072.

Hypersensitivity. Fatal reactions after polygeline infusion have been reported in 2 patients with bronchial asthma.[1,2] Both patients were undergoing epidural analgesia with bupivacaine and polygeline was given to correct hypotension that had not responded to infusion of crystalloids. One patient developed focal seizures.[2] Both patients developed refractory bronchospasm and cardiac arrhythmias and died despite intensive resuscitation attempts.

Licensed drug information recommends that prophylaxis with histamine H_1- and H_2-antagonists should be given to patients with known allergic conditions such as asthma. Similar advice has been offered[3] for patients undergoing anaesthesia and receiving polygeline following findings of an increased incidence of severe histamine-related reactions in such patients. Nevertheless, severe respiratory distress developed in an asthmatic patient given polygeline under spinal anaesthesia despite premedication with bronchodilators and antihistamines.[4]

There is a possibility of cross reactivity between polygeline and succinylated gelatin (see Gelatin, p.1072).

1. Freeman MK. Fatal reaction to haemaccel. *Anaesthesia* 1979; **34:** 341–3.
2. Barratt S, Purcell GJ. Refractory bronchospasm following "Haemaccel" infusion and bupivacaine epidural anaesthesia. *Anaesth Intensive Care* 1988; **16:** 208–11.
3. Lorenz W, *et al.* Incidence and clinical importance of perioperative histamine release: randomised study of volume loading and antihistamines after induction of anaesthesia. *Lancet* 1994; **343:** 933–40.
4. Kathirvel S, *et al.* Severe life threatening reaction to Haemaccel in a patient with bronchial asthma. *Eur J Anaesthesiol* 2001; **18:** 122–3.

Precautions

Precautions that should be observed with plasma expanders are described under Dextran 70, p.1060, and should be considered when polygeline is used for this purpose.

Polygeline preparations contain calcium ions and therefore should be used with caution in patients being treated with cardiac glycosides.

Pharmacokinetics

Like gelatin, polygeline is excreted mainly in the urine. The half-life is about 5 to 8 hours.

Renal impairment. In a study[1] in 52 patients with normal or impaired renal function given 500 mL of polygeline 3.5% about 50% of the dose was excreted in the urine within 48 hours in those with normal renal function. Excretion of polygeline in those with renal impairment, based on the patient's glomerular filtration rate (GFR), was found to be:

- GFR 31 to 90 mL/minute: unimpaired
- GFR 11 to 30 mL/minute: slightly reduced
- GFR 2 to 10 mL/minute: reduced to 27% in 48 hours
- GFR 0.5 to 2 mL/minute: reduced to 9.3% in 48 hours

The mean half-life of the elimination phase was 505 minutes in those with adequate renal function, increasing to 985 minutes in those with end-stage renal failure. Polygeline 500 mL of 3.5% solution could be given twice weekly for 1 to 2 months even in patients with total anuria.

1. Köhler H, *et al.* Elimination of hexamethylene diisocyanate cross-linked polypeptides in patients with normal or impaired renal function. *Eur J Clin Pharmacol* 1978; **14:** 405–12.

Uses and Administration

Polygeline is a plasma volume expander used as a 3.5% solution with electrolytes in the management of hypovolaemic shock (p.1183). The rate of infusion depends on the condition of the patient and does not normally exceed 500 mL in 60 minutes although it may be greater in emergencies. Initial doses for hypovolaemic shock usually consist of 500 to 1000 mL; up to 1500 mL of blood loss can be replaced by polygeline alone. Patients losing greater volumes of blood will require blood transfusion as well as plasma expanders.

Polygeline is also used in extracorporeal perfusion fluids, as a perfusion fluid for isolated organs, as fluid replacement in plasma exchange, and as a carrier solution for insulin. For plasma exchange, up to 2 litres of polygeline may be given as sole replacement fluid.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Haemaccel†; ***Austral.:*** Haemaccel; ***Austria:*** Haemaccel; ***Belg.:*** Haemaccel†; ***Braz.:*** Haemaccel; ***Chile:*** Haemaccel†; ***Cz.:*** Haemaccel†; ***Ger.:*** Haemaccel; ***Gr.:*** Haemaccel†; ***Hong Kong:*** Haemaccel†; ***India:*** Haemaccel; ***Indon.:*** Haemaccel; ***Irl.:*** Haemaccel†; ***Israel:*** Haemaccel†; ***Ital.:*** Emagel; Gelplex; ***Malaysia:*** Haemaccel†; ***Mex.:*** Haemaccel; Phygelin; ***Neth.:*** Haemaccel; ***Norw.:*** Haemaccel†; ***NZ:*** Haemaccel; ***Port.:*** Haemaccel; ***S.Afr.:*** Haemaccel; ***Singapore:*** Haemaccel; ***Switz.:*** Haemaccel†; ***Thai.:*** Haemaccel; Plasmax; ***UK:*** Haemaccel.

Protein C

Autoprothrombin IIA; Factor XIV; Proteína C.

ATC — B01AD12.

ATC Vet — QB01AD12.