Hematopoietic

Effects of scaffold-delivered SDF-1 alpha protein in chronic rat myocardial infarction model.

Authors: Yu J., Sievers R.E., Lee R.J.

Publication Date: 2014

Abstract:

The delivery of stromal cell-derived factor (SDF)-1 alpha protein via a bioactive scaffold for the repair of chronically damaged myocardium was investigated using in situ tissue engineering. SDF-1 alpha protein, fibrin, or SDF-1 alpha protein in a fibrin matrix were delivered into the myocardium of a rat ischemic cardiomyopathy model five weeks after myocardial infarction (MI). Echocardiography was performed before and five weeks after treatment. The hearts were examined histologically for angiogenesis, infarct size, and stem cell migration. SDF-1 alpha protein alone and fibrin glue both retarded heart function deterioration by recruiting stem cells into the infarcted myocardium and stimulating neovascularization. SDF-1 alpha delivered with fibrin glue recruited the highest quantity of CD34+ in the infarcted area. SDF-1 alpha and fibrin influence the myocardial microenvironment in a chronic MI through the recruitment of stem cells, resulting in arteriogenesis and preservation of left ventricular function. In situ tissue engineering shown to be a viable approach for the treatment of chronic ischemic cardiomyopathy.

Study of the usefulness of fibrin gel as a biological scaffold for intracerebral transplantation of mesenchymal stem cells. [Italian]

Authors: Bonilla Horcajo C., Otero L., Aguayo C., Rodriguez A., Zurita M., Vaquero J.

Publication Date: 2009

Abstract:

Objetive: To analyze the effect of intracerebral transplantation of adult stem cells obtained from bone marrow stroma in an experimental model of traumatic brain injury. Material and Method: We performed a traumatic brain contusion in 20 adult Wistar rats. At 2 months of injury, 3x10⁶ bone marrow stromal cells as saline suspension of CM, with a total volume of 30 muL, was injected in the area of traumatic brain injury. In 10 animals the injection was made directly over the traumatic brain injury and in other 10 animals the injection was made on the mesh of fibrin gel. The functional evolution of animals was studied from injury to two months after transplantation using the mNSS test and the Rota-rod test. Results: All animals showed a clear and significant functional deficits after traumatic injury, and experienced significant improvement after intracerebral transplantation of bone marrow stromal cells, with no statistically significant differences between experimental groups. Conclusion: The insertion of a mesh of fibrin in the area of brain injury, as support for intralesional administration of CM, in an experimental model of traumatic brain injury, does not seem to be a useful technique to optimize the functional results obtained with this type of therapy cell.

Fibrin glue therapy for severe hemorrhagic cystitis after allogeneic hematopoietic stem cell transplantation.

Authors: Tirindelli M.C., Flammia G.P., Bove P., Cerretti R., Cudillo L., de Angelis G., Picardi A., Annibali O., Nobile C., Cerchiara E., Dentamaro T., de Fabritiis P., Lanti A., Ferraro A.S., Sergi F., di Piazza F., Avvisati G., Arcese W.

Publication Date: 2014

Abstract:

Hemorrhagic cystitis (HC) occurring after allogeneic transplantation significantly affects quality of life and, in some cases, becomes intractable, increasing the risk of death. To date, its therapy is not established. We used the hemostatic agent fibrin glue (FG) to treat 35 patients with refractory post-transplantation HC. Of 322 adult patients undergoing an allogeneic transplantation for hematological malignancy, 35 developed grade >= 2 HC refractory to conventional therapy and were treated with FG, diffusely sprayed on bleeding mucosa by an endoscopic applicator. The cumulative incidence of pain discontinuation and complete remission, defined as regression of all symptoms and absence of hematuria, was 100% at 7days and 83% +/- 7%, respectively, at 50 days from FG application. The 6-month probability of overall survival for all 35 patients and for the 29 in complete remission was 49% +/- 8% and 59% +/- 9%, respectively. In the matched-pair analysis, the 5-year probability of overall survival for the 35 patients with HC and treated with FG was not statistically different from that of the comparative cohort of 35 patients who did not develop HC (32% +/- 9% versus 37% +/- 11%, P = not significant). FG therapy is a feasible, effective, repeatable, and affordable procedure for treating grade >=2 HC after allogeneic transplantation.

Fibrin glue for treatment of severe haemorrhagic cystitis following allogeneic haematopoietic stem cell transplantation.

Authors: Tirindelli M.C., Flammia G., Sergi F., Cerretti R., Cudillo L., Picardi A., De Angelis G., Bove P., Cefalo M.G., Cerchiara E., Altomare L., Allori G., Lanti A., Avvisati G., Arcese W.

Publication Date: 2013

Abstract:

Background: Patients undergoing hematopoietic stem cell transplant (HSCT) are particularly exposed to the risk of developing haemorrhagic cystitis (HC), which is characterized by symptoms ranging from macroscopic haematuria to renal failure. HC signifi- cantly affects quality of life and in some cases becomes intractable leading to patient death. Its therapeutic management has not been established. In this prospective study, we used Fibrin Glue (FG), an haemostatic agent derived from human plasma, to treat 34 patients with refractory post-transplant HC. Materials and methods: Between January 2006 and October 2012, 1116 (249 children and 867 adults) underwent an HSCT at the Rome Transplant Network. Among adults, 554 received an autologous HSCT and no patient developed HC. Of 313 patients undergoing an allogeneic HSCT (HLA sib. n=140, MUD n=71, UCB n=28, Haplo n=74) 45 (14%) developed HC, which was of grade >=II in 34 patients (grade: II n=10, III n=21, IV n=3). All these patients refractory to conventional therapy for HC were treated with FG. During cystoscopy bladder distension was maintained at a constant pressure of 12 mmHg by a carbon dioxide insufflator and FG was diffusely sprayed on bleeding and raw surfaces of bladder mucosa by an endoscopic applicator. The response was evaluated at 10, 30 and 60 days from first FG application. Results: The number of FG application was 1 in 21 patients, 2 in 10 and 3 in 3 with a median FG volume of 10.8 ml (range, 6.3-16). The pelvic pain disappeared within the first 24 hours from FG application in all patients and the complete remission, defined as regression of all symptoms and absence of haematuria, evaluated at 10, 30 and 60 days was achieved in 18%, 61%

and 83% of patients, respectively. The response was independent from platelets recovery and BK viruria and its treatment. Conclusions: FG therapy is an effective, feasible, and reproducible procedure to treat grade >= II refractory HC.

Fibrin glue directly applied on damaged bladder mucosa during cystoscopy is highly effective to treat severe, refractory, haemorrhagic cystitis after allogeneic transplant.

Authors: Tirindelli M.C., Flammia G., Cudillo L., Dentamaro T., Picardi A., Annibali O., Tendas A., Cupelli L., Nobile C., Marchesi F., Cerretti R., Mirabile M., De Angelis G., Girardi K., De Fabritiis P., Avvisati G., Arcese W.

Publication Date: 2010

Abstract:

Background: Hemorrhagic Cystitis (HC) occurring after hematopoietic stem cell transplant (HSCT) significantly affects quality life of patients, prolongs hospitalization and in some cases can become a life-threatening complication. Its management has not been established. Fibrin Glue (FG) is a hemostatic agent derived from human plasma with proven efficacy in repairing damaged tissues. Study design and methods: This study included patients who met the following criteria: grade >=3 HC not responding to hyperhydration, bladder irrigation, antiviral treatments and transfusion support. FG was obtained using Vivostat system, an automatic method for processing and applying FG. During conventional cystoscopy and maintaining bladder distension by a CO2 insufflator, FG was accurately sprayed through a specific applicator on bleeding mucosa. FG polymerized on contact and set over several days. The response to the treatment was defined complete (CR) for disappearance of hematuria, partial (PR) for at least one grade regression of HC and no response (NR). Results: From Jan 06 to Oct 09, 626 patients undergoing an autologous (n = 428) or allogeneic (n = 198) HSCT were registered at the RTN. No autologous HSCT recipients developed HC of severe grade, whereas 18 of 198 patients (9%) undergoing an allogeneic HSCT met the criteria to enter the study. These 18 patients (6 M, 12 F) with a median age of 32.5 years (range, 18-53) had been submitted to a HSCT from HLA identical sib. (n = 4), unrelated CB (n = 4), MUD (n

= 2) or related haploidentical donor (n = 8) for different hematological malignancies. All patients, deeply immunosuppressed with positive BKV viruria >7x10⁶ copies/ml, developed a very severe HC, refractory to all current treatments including antiviral therapy. At time of FG application, HC persisted for a median of 16 days (range, 7-65) and was grade 3 and 4 in 14 and 4 patients, respectively. The number of FG applications was 1 in 15 patients, 2 in 2 and 3 in 1 patient for a median of 11 mL (range, 6.3-16.2) of glue. The treatment was successful in 16 out of 18 patients (89%). All 14 patients with grade 3 HC responded and the response was complete in 12 (86%) and partial in 2 (14%), while of the 4 patients with grade 4 HC: 1 achieved CR, 1 PR and 2 NR. No patient died of HC. Conclusions: FG therapy is a feasible, safe, easy repeatable, not invasive, small time consuming, lightly expensive and highly effective procedure in treating severe, refractory posttransplant HC.

Fibrin glue as a vehicle for mesenchymal stem cell delivery in bone regeneration.

Authors: Lee O.K.

Publication Date: 2008

Abstract:

Not Available

Re: Fibrin Glue Therapy for Severe Hemorrhagic Cystitis after Allogeneic Hematopoietic Stem Cell Transplantation.

Authors: Schaeffer EM

Publication Date: 2016

Abstract:

Not Available