Case Report

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Role of Autologous Platatelet Rich Plasma in Wound Bed Preparation of Nerotising Facitis

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Abstract

Necrotizing fasciitis results in gross morbidity and mortality if not treated early. Necrotizing fasciitis is a potentially fatal infection involving the subcutaneous tissue and fascia. It is commonly known as flesh-eating disease. APRP helped as an adjuvant therapy for optimizing the outcome in various indications of plastic surgery. In our case report, we discuss the role of Autologous Platelet Rich Plasma (APRP) as an adjunct therapy in wound bed preparation of necrotizing fasciitis.

Keywords: Necrotizing fascitis; Autologous platelet rich plasma; Wound bed preparation.

INTRODUCTION

Necrotizing fasciitis is classified based on polymicrobial or monomicrobial, anatomy, and depth of infection. Polymicrobial NF mostly occurs in immunocompromised individuals. Monomicrobial NF is less common and affects healthy individuals who often have a history of trauma. Patients with NF can present with symptoms of sepsis, systemic toxicity, or evidence of skin inflammation, with pain that is disproportional to the degree of inflammation.[1,2] Hyperacute cases present with sepsis and quickly progress to multiorgan failure, while subacute cases remain indolent, with soft tissue infection. Laboratory and radiologic tests can be useful in deciding which patients require surgical consultation. Once NF is diagnosed, next steps include early wound debridement, excision of nonviable tissue, and wide spectrum cover with intravenous antibiotics. Post debridement of necrotic tissue which will cause raw area, which will be initially unhealthy for wound cover. Autologous platelet rich fibrin plasma that is rich in growth factors is successful regenerative option available in plastic surgery.[3,4] In our study we used APRP (Autologous platelet rich protein) an adjunct for preparing wound bed in the management of Necrotizing fasciitis.

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MATERIALS AND METHODS

This study was conducted in the department of plastic surgery in a tertiary care centreafter obtaining the departmental ethical committee approval. Informed written consent was taken from the patient. The study is a prospective observational type done on a 60 year old male with known co-morbidities including hypertension & coronary artery disease with ejection fraction of 25%. Patient presented with raw area (fig. 1) over left lower limb & perineum of one month duration. He was

apparently well one month back when he developed multiple blebs over left lower limb & perineum which ruptured leaving raw area with rapid progression of wound infection with foul smelling discharge. He was diagnosed with clinically as a case of necrotizing fasciitis. He underwent multiple debridement in referral surgery department after that he was referred to department of plastic surgery for further wound care. There are various modalities of regenerative wound care out of which here we used Autologous platelet rich plasma (fig. 2) as a regenerative modality for wound care. APRP was used for the wound bed preparation in our case. After taking informed consent 4.5 ml of whole blood was taken from peripheral vein with sterile precautions and 0.5 ml of 3.2% Sodium Citrate was added to make it 5 ml (blood: anticoagulant at 9:1). The centrifugation tube was placed in centrifugation apparatus. The solution was centrifuged at 3000 rpm for 10 minutes. Three portions were seen after first centrifugation. Upper portion containing plasma and platelets, middle portion containing White blood cells (WBCs) with some platelets (Buffy coat) and lower portion containing red blood cells (RBCs). Middle and lower portions are discarded. Upper portion was transferred taken in a new tube for re-centrifugation at 4000 rpm for 10 minutes. Following which two portions were seen. Upper 2/3rd portion containing platelet poor plasma and lower 1/3rd portion containing platelet rich plasma & erythrocyte with platelet Clump.[5] Lower 1/3rd portion was used for APRP therapy. The APRP was injected to the raw area at multiple sites (figure 3) and edges of the woundand followed by covered with a sterile dressing and applied over the wound. Three sittings were done 5 days apart and the wound bed was reassessed after 3 weeks. Till wound bed got ready cadaveric human skin (allograft) was used as biological dressing. Wound bed was reassessed every weekly till wound bed got ready for cover by skin graft or flap.

RESULTS

After 3 weeks, the wound bed got ready with appearance of healthy granulation tissue (fig. 4). The future plan is to cover the raw area with skin grafting.

DISCUSSION

Necrotizing fasciitis are severe and may be fatal. Early identification and treatment are necessary. Usually, a multidisciplinary approach is required. To properly care for such individuals, early repair and efficient rehabilitation are also imperative. Studies that span multiple disciplines and institutions are necessary. Necrotizing Fasciitis can have a complicated and time consuming course of treatment. Management of the infection begins with antibiotic treatment. In the majority of cases with NF (70–90%) the reasonable pathogens are two or more, suggesting the use of broad spectrum antibiotics. The value of antibiotic treatment in NF is relatively low, and early and aggressive drainage and debridement is required. In NF of the extremities, the clinician should consider amputating the infected limb, although this will not reduce the risk of mortality. Finally, postoperative management of the surgical wound is important, along with proper nutrition of the patient.In our study we used Autologous platelet rich plasma as an adjuvant therapy in wound bed preparation of necrotising fasciitis.[6] Both haemostasis and the process of healing a wound depend heavily on platelets. Keratinocyte, fibroblast, and endothelial cell migration, proliferation, and activities are all aided by the release of cytokines and growth factors by platelets. Chronic wounds experience a delay in the inflammatory stage of recovery.[7,8] They do not heal because they lack the development factors. Growth factors are generated from platelets and can be found in platelet rich plasma (PRP), platelet rich fibrin (PRF), and platelet rich plasma (PRF). Application of therapies produced from platelet-rich plasma is helpful in this regard. Action of platelet is release of bioactive proteins responsible for attracting macrophages, mesenchymal stem cells, and osteoblasts. These cells are known to promote removal of necrotic tissue and enhances tissue regeneration and healing.It is also helpful in acceleration of wound healing.[9] Platelet-Rich Plasma (PRP) is defined as a portion of the plasma having a higher concentration of platelet. It consists of platelets with clotting and growth factors. The APRP preparation method is simpler, requires little handling, and is not dependent on an anticoagulant or thrombin activator. The necessary items are conveniently available in a hospital. A special architecture that aids in the healing process is provided by the activity of autologous growth factors and the biomechanical stiffness of plasmatic proteins after fibrin formation.[10,11] In addition to fibrin, fibronectin, and vitronectin, growth factors from activated platelet alpha-granules also play a significant role in tissue repair. These growth factors are hepatocyte growth factor (HGF), fibroblast growth factor-b (FGFb), PDGF, vascular endothelial growth factor (VEGF), epidermal growth factor (EGF), and angiopoietin-I.[12] In our

investigation, APRP aided as the adjuvant in the wound bed preparation.

CONCLUSION

This is a preliminary study to assess the use of APRP in Necrotizing Fasciitis as wound bed preparation. A large multicentric, double blinded control study with statistical analysis is required to further substantiate the results.

Conflicts of interest: None

Author's contributions: All authors made contributions to the research, is putatively expected to be useful article.

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