Original Article

Indian Journal of Genetics and Molecular Research
Volume 11 Number 2, July-December 2022
DOI: http://dx.doi.org/10.21088/ijgmr.2319.4782.11222.1

Role of APRP in Thermal Burns

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How to cite this article:
Indira Ramasamy, Neljo Thomas, Ravi Kumar Chittoria/Role of APRP in Thermal Burns/Indian J Genet Mol Res. 2022; 11(2):45–47.

Abstract

The efficacy of Autologous Platelet Rich Plasma (APRP) for adult thermal burns for better wound bed preparation. APRP is an increasingly popular adjunct in surgical, medical and aesthetic interventions. Their beneficial effects lie in their ability to deliver a high concentrate of growth factors. In our study APRP was utilised in a subject with adult thermal burns to evaluate the efficacy and mechanism of action of a non-invasive intervention approach using APRP.

Keyword: Autologous Platelet Rich Plasma; Thermal burn; Wound bed.

INTRODUCTION

Autologous Platelet Rich Plasma is a blood product rich in platelets, growth factors and chemokines. Since 1990s role of PRP is being discussed as an agent in tissue repair.[1] Now a days it is widely studied for its role in scar reduction.[2] It is prepared by centrifuging blood of patient. Blood is separated into 3 layers as Platelet poor plasma (PPP) at top, PRP in middle and RBC at bottom. RBC and PPP are discarded sequentially. PRP obtained is added with thrombin. Here in this study, we are evaluating the effect of APRP in preparation of wound bed in a patient with thermal burns.

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Received on: 18.07.2022

Accepted on: 18.08.2022

MATERIALS AND METHODS

This study was conducted in tertiary care centre in department of Plastic Surgery after getting the department ethical committee approval. Informed consent was obtained for examination and clinical photography. A 16-year-old female with no known comorbidities presented with an alleged suicidal self immolation with kerosene causing her to sustain 2nd degree and 3rd degree burn involving both lower limb from ankle to thigh (Fig. 1). Patient was treated with local injection of APRP (Fig. 2). Autologous platelet rich plasma (APRP) obtained by standard double centrifugation protocol using 10cc of the patient's blood was used for better wound bed preparation of the thermal wound with APRP being injected over 2 sittings over 4 days. Subsequently skin grafting was done.

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Fig. 1: Thermal burn involving both the lower limb from ankle to thigh.

Fig. 2: Application of APRP in the thermal wound for wound bed preparation.

RESULTS

There was better wound bed preparation on application of APRP and the uptake of the skin graft was better (Fig. 3).

Fig. 3: Post APRP skin grafting was done.

DISCUSSION

Autologous platelet rich plasma (APRP) as the name implies refers to the plasma derived from the patient's own blood with a platelet count higher than the platelet counts in the peripheral blood of the patient. Historically having been used to treat thrombocytopenia, the use in other specialties became widespread with its use in sports medicine to treat musculoskeletal injuries.[4] Its use in wound management results from the observation that wounds have a proinflammatory environment that impairs healing. In addition, wounds have a high protease activity that impairs functioning of growth factors. APRP has also been shown to stimulate human dermal fibroblast proliferation and thus increasing the deposition of TYPE I collagen, the above mechanism being proposed to its use in scar management. Application of activated APRP also provides 5 to 10 times the normal concentration of growth factors that include PDGF, VEGF, TGF-β locally also accelerating wound healing. Addition of calcium salts also helps in activation of platelets.

Usually, around 1 to 1.5 ml of APRP can be obtained from 10 ml of patient's blood. Hence, the disadvantage of the use of APRP lies in its use in wounds of a large surface area that would require a large volume of blood which in a patient with a chronic non healing wound or a traumatic wound requires consideration.

CONCLUSION

Autologous platelet rich plasma is an effective measure in the preparation of wound bed before skin grafting but requires large randomized trials in tertiary care centres for large scale application to explore the potential of APRP in the preparation of wound bed.

REFERENCES

1. Pierce GF, Mustoe TA, Altrock BW, et al. Role of platelet-derived growth factor in wound healing. J Cell Biochem 1991; 45: 319–326.
2. Alser OH and Goutos I. The evidence behind the use of platelet-rich plasma (PRP) in scar management: a literature review. Scars, Burns & Healing, Volume 4, 2018.

3. Baryza MJ, Baryza GA. The Vancouver Scar Scale: an administration tool and its interrater reliability. J Burn Care Rehabil. 1995 Sep-Oct;16(5):535-8.
4. Mishra A, Harmon K, Woodall J, Vieira A. Sports medicine applications of platelet rich plasma. Curr Pharm Biotechnol. 2012 Jun; 13(7):1185-95.