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Original Research Article

EFFICACY OF AUTOLOGOUS PLATELET RICH PLASMA IN COMPARISION WITH COLLAGEN GRANULE DRESSING IN CHRONIC NONHEALING ULCER

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Abstract

Background & Method: The study was conducted in department of General Surgery, Index Medical College Hospital and Research Centre, Indore in a period of 12 months, in which 102 patients between 18 to 80 yr age having chronic non healing ulcer was taken. Out of which 51 patients received PRP and 51 patients received collagen granule dressing for 6weeks and followed for the outcome after 6 weeks.

Result: Both the PRP and collagen dressing are repeated once weekly for 6 weeks. At every week the ulcer area and volume is calculated and photographs are taken. Results are assessed at the end of 6weeks for the extent of wound closure on the basis of percentage change of the area and volume.

Conclusion: The result from study showed that PRP is safe and effective treatment with faster healing rates and takes less time to cover the ulcer area in comparison to collagen dressing. The difference between the outcome of 2 dressings was statistically significant (P value <0.05) A large population based study is needed to further consolidate the finding of the present study.

Keywords: autologous, platelet, plasma & collagen.

Introduction:

An ulcer is referred to as chronic non healing when it does not recover fully or doesn't show any sign of improvement after at least 6 weeks of optimal treatment[1]. Chronic venous insufficiency and diabetic foot ulcer are the most common causes of chronic non healing ulcer. Almost 15% diabetic patient develop diabetic ulcer in their lifetime. Approximately 20% of venous ulcer do not heal after 1 yr & 8% do not heal after 5yr.

Traditional regular dressing and wound debridement cannot provide satisfactory results since these treatments are not able to provide the necessary GF's. Various new methods are emerging such as PRP(platelet rich plasma) and collagen granule dressing that has an adjunctive role in a standardized, quality treatment plan[2]. Platelet rich plasma (PRP) helps in enhancing the wound healing by releasing various GF's Also the end process in any wound healing is wound contracture and scar which is composed of collagen fibers so collagen granule play important role in this stage of wound healing[3].

Various studies have been carried out to compare efficacy of PRP & collagen dressing with traditional dressing but not many studies are there to compare effectiveness of PRP with collagen[4]. Hence this study was undertaken to compare the two modern biological methods for promoting healing of chronic ulcer[5].

Aim: To evaluate the efficacy of PRP dressing in comparison with collagen granule dressing in the process of wound healing in chronic non healing ulcer in a period of 6 weeks.

Objective

To evaluate the outcome at the end of 6 weeks by both methods.

To compare the rate of wound healing during the study in both groups.

Material & Method

The study was conducted in department of General Surgery, Index Medical College Hospital and Research Centre, Indore in a period of 12 months, in which 102 patients between 18 to 80 yr age having chronic non healing ulcer was taken. Out of which 51 patients received PRP and 51 patients received collagen granule dressing for 6weeks and followed for the outcome after 6 weeks.

Inclusion criteria

Patient in the age group of 18 to 80 years.

Long standing non healing ulcers.

Ulcer of more than 6 week duration.

Ulcer of less than 25cmsq. in size.

Exclusion Criteria

Patients >80years & <18 years.

Ulcers of less than 6 weeks duration.

Patients with bleeding disorder.

Actively infected ulcers.

Hypersensitivity to collagen.

Patient on anticoagulant medication.

Selected patients were thoroughly examined for length, breath and depth of the ulcer by Clock face method described by Sussman using cotton tip applicator and disposable paper ruler.

Procedure of Collagen Application

Results

Both the PRP and collagen dressing are repeated once weekly for 6 weeks. At every week the ulcer area and volume is calculated and photographs are taken. Results are assessed at the end of 6weeks for the extent of wound closure on the basis of percentage change of the area and volume by- " initial measurement minus assessment day measurement divided by initial measurement."

Table 1: Sex wise distribution

			Dressing		Total
			PRP	Collagen	
Sex	Female	Count	18	11	29
		% within Dressing	35.3%	21.6%	28.4%
	Male	Count	33	40	73
		% within dressing	64.7%	78.4%	71.6%
Total		Count	51	51	
		% within dressing	100%	100%	

Table 2: Site wise distribution of wounds

Site of wound	No. of patients
Back	2
Left upper limb	1
Left leg	23
Left foot	15
Right upper limb	6
Right leg	21
Right foot	29
Sacrum	5
TOTAL	102

Table 3: Comparison of Mean Reduction in Area on the basis of type of dressing

Duration	Dressing	N	Mean (in cm2)	S.D	P value
Area Difference Pre to 2 Weeks	PRP	51	4.521	1.749	
	Collagen	51	3.569	1.020	0.001
Area Difference Pre to 4 weeks	PRP	51	9.369	3.038	
	Collagen	51	7.597	2.026	0.001
Area Difference Pre to 6 weeks	PRP	51	13.256	4.357	
	Collagen	51	11.260	3.079	0.009

Table 4: Association between outcome and type of dressing

Outcome		Dressing		Total
		PRP	Collagen	
Complete	Count	14	5	19
	%	27.5%	9.8%	18.6%
Prolong	Count	37	46	83
	%	72.5%	90.2%	81.4%
Total	Count	51	51	102
	%	100%	100%	100%

Discussion

Wound healing involves a timely expression of various growth factors that promotes cellular proliferation and migration, collagen deposition and formation of new connective tissue matrix[6].

Collagens are Proline-rich proteins that are fibrous with long, stiff, triple stranded helical structure comprising of three α-chains[7]. The major collagen molecules that give tensile strength to skin are heterotrimeric collagen type I, formed by two α 1(I) chains and one α 2(I) chain and homotrimeric collagen type III, formed by three α1(III) chains. The role of collagen in improving wound healing is by stimulating fibroblast activity[8].

Conclusion

The result from study showed that PRP is safe and effective treatment with faster healing rates and takes less time to cover the ulcer area in comparison to collagen dressing. The difference between the outcome of 2 dressings was statistically significant (P value <0.05) A large population based study is needed to further consolidate the finding of the present study.

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