Original Research Article

"Comparison of Platelet rich plasma mesotherapy versus Vitamin C hyaluronic acid mesotherapy for facial skin rejuvination"

ABSTRACT

Mesotherapy is a treatment that allows skin layers to be bio-stimulated and and is one of the most powerful ways to rejuvenate the skin.

Mesotherapy also stimulate the fibroblast and lead to more desired type of collagen formation for skin rejuvenation[1]

Mesotherapy earlier was done using derma roller with fine needles which caused pain, bleeding and infections in patients.

In lieu of that recently needless mesotherapy have been advocated by various authors which is a safe and less invasive procedure. This technique utilizes weak electric current for bio-rejuvination with electrophoresis and iontophoresis[1]. During this procedure ,active substances can also be transported into the skin with the use of electroporation (electric fields) and ultrasounds. Electroporation is achieved through high voltage electrostatic field.

Certain authors have proposed various products for mesotherapy sessions including platelet rich plasma , Vitamic C etc to obtain beneficial results[2]

Role of platelet rich plasma are new combination studies for the improvement of skin remodeling with lesser side effects[3].It has major growth factors like transforming growth factor beta, vascular endothelial growth factor and epidermal growth factors. It stimulates collagen and elastin production which thickens and tightens thinning skin, effectively smoothing wrinkles and fine lines[4] Because it boosts collagen, it's also a great treatment for improving overall skin texture and tone[3]

Vitamin C with hyaluronic acid has become very popular in both esthetic medicine and cosmetology. The importance of vitamin C lies behind its powerful scavenging and antioxidant effect as it usually accumulates in the immune cells as PMNs and macrophages and significantly enhances chemotaxis, phagocytic, opsonization, degranulation, and killing functions of immune cells[2] It is mainly responsible for cohesion of connective tissue and skin elasticity[6] Preparations using hyaluronic acid increases fibroblast activity and as a result increases collagen production and bio-stimulation of skin[2]

Thus a study is aimed to compare the effectiveness and safety of needleless mesotherapy with PRP versus needleless mesotherapy with vitamin C hyaluronic acid for skin rejuvenation.

A null hypothesis is also proposed stating that there is no patient satisfaction after needless mesotherapy with PRP versus needleless mesotherapy with Vitamin C hyaluronic acid.

INTRODUCTION

The term “mesotherapy” is derived from the Greek words “mesos” meaning “middle” or “mean” and “therapeia” meaning “to treat medically,” i.e. Intradermotherapy, or administering an injection to the middle layer of skin [1]. Mesotherapy is a technique that uses injections of vitamins, enzymes, hormones, and plant extracts to rejuvenate and tighten skin, as well as remove excess fat.

Mesotherapy for the first time was developed in 1952 by Dr. Michel Pistor, a French physician in order to treat vascular diseases and pain. He also coined the term “mesotherapy.” In 1976, Pistor founded the French Society of Mesotherapy in 1964 and The French National Academy of Medicine[1] recognised mesotherapy as a medical speciality in 1987. The French National

Academy of Medicine[2] recognised mesotherapy as a medical speciality in 1987. Layers of fat and connective tissue beneath the skin are treated using mesotherapy by injecting drugs, reagents, and plant extracts into them. [2]. This technique involves micro-injections of therapeutic substances, such as hyaluronic acid, vitamins, minerals, and amino acids into the superficial papillary dermis of the skin.[3]. The technique uses very fine needles to deliver a series of injections into the middle layer (mesoderm) of skin[2]. Previously, the injections were given at different depths- from 1 to 4 millimeters into the skin depending on the skin type.

Mesotherapy earlier was done using derma roller with fine needles which caused pain, bleeding and infections in patients. In lieu of that recently needless mesotherapy have been advocated by various authors which is a safe and less invasive procedure. No-needle mesotherapy, a form of treatment that replaces needle therapy, has recently gained a lot of popularity. One of the most current ideas that might become a ground-breaking method to reverse the ageing process is mesotherapy. This technique utilizes weak electric current for bio-rejuvination with electrophoresis and iontophoresis[3] . Active compounds can also be injected into the skin during this treatment using ultrasounds and electroporation (electric fields). High voltage electrostatic fields are used to achieve electroporation. The impact of this field, however brief only milliseconds—causes pores in the cell membrane that are several nanometers large to open.

Various constituents of the polycomponent mesotherapy may include Hyaluronic acid Vitamins-A,C ,various minerals and coenzymes[4] and the recent literature suggests the use of PRP formulations has shown good results.

The extracellular matrix, which plays a significant role in maintaining the health of the oral tissues and the healing and repair process, is the basic mechanism underlying the usage of hyaluronic acid[7] and vitamin C together. The primary factors driving its activity are promoting cellular migration, proliferation, and vasculature while also repairing the integrity of the dermal and epidermal layers. [6]. HA plays an important role in hydration of the extracellular space due to it's ability to attract water molecules. Some clinical experiments have proved that HA microinjections can stimulate fibroblasts[6] by expressing collagen type-1, MMP-1 and tissue inhibitor of matrix metalloprotinases (TIMP-1).

Despite the fact that relatively few research specifically mention advantages for face and neck skin rejuvenation, PRP has been used in aesthetic treatment as well [7]. And the reason PRP is used is because it has a a significant number of thrombocytes (platelets)[9]. After being activated by

aggregation initiators, platelets produce a number of growth factors into their -granules. The process of stimulating fibroblast collagen synthesis is aided by a number of growth factors and cytokines [7]. The concentrated platelet granules that have been triggered by aggregation inducers secrete a variety of growth factors, such as Transforming growth factor (TGF), vascular endothelial growth factor (VEGF), and insulin-like growth[21] factor are examples of growth factors (GF).There are more than 30 bioactive substances in these α-granules[8]

In the literatures ,no study has been conducted as of our knowledge which compared the PRP mesotherapy with Hyaluronic acid+ Vitamin C mesotherapy.

So we aimed to compare the effectiveness and safety of needleless mesotherapy with PRP versus needleless mesotherapy with vitamin C hyaluronic acid for skin rejuvenation.

1.1 AIMS

To clinically evaluate and compare the efficacy and safety of needlessless mesotherapy for facial skin rejuvenation using PRP versus Vitamin C with hyaluronic acid.

1.2 OBJECTIVES

Postoperative assessment of all patients will be done under the following parameters-

1. The effect of platelet rich plasma mesotherapy versus Vitamin C hyaluronic acid mesotherapy procedure on skin rejuvenation using Global Esthetic assessment scores, Linkert's patient satisfaction scale and portable skin hydration analyzer.

2. To study safety of PRP versus hyaluronic acid Vitamin C mesotherapy by evaluating skin reactions like allergies, rashes and skin eruptions.

METHADOLOGY

MATERIAL REQUIRED

1)Diagnostic instruments (mouth mirror, tweezer, straight probe)

2)Topical local anesthesia solution (2% lignocaine with adrenaline)

3) PRP

4) Serum viles containing vitamin C hyaluronic acid

5) Mesotherapy unit

6) EMLA cream

7) Cotton pellets

8) Centrifugation machine

9) Test tubes

10) Anti coagulant Dextrose A

METHOD OF COLLECTION OF DATA

The study will be conducted on thirty-two patients reporting to OPD of OMFS requiring mesotherapy sessions. Patients will be examined, screened and selected based on inclusion and exclusion criteria starting from December 2020 .This study aims to compare the efficacy and safety of PRP mesotherapy versus vitamin C hyaluronic acid needleless mesotherapy. Patients will be randomly allocated in two groups and randomization will be done using chit system.

Group A (Needless mesotherapy with PRP)

Group B (Mesotherapy with Vitamin C hyaluronic acid)

Both groups will consist of 16 patients each.

Aesthetic outcomes will be assessed using two grading scales and skin analyzer for objective evaluation.

Inclusion criteria

1) Acne scars

2) Static and dynamic wrinkles

3) Periorbital depigmentation

4) Facial skin tightening procedures.

5) Facial scarring.

6) Skin ageing

7) Fine lines

Exclusion criteria

1. Patients with systemic disease or possible compromised immune system.
2. Patients with a history of allergy or hypersensitivity to drugs, antibiotics or anti-inflammatory agents.
3. Patients with a history of bleeding disorder.
4. Patient not willing to undergo treatment.
5. Patients having keloid scarring or keloid tendency.
6. Pregnancy and lactation.

PRE-OPERATIVE EVALUATION

1. Patients will be selected based on the inclusion and exclusion criteria
2. Complete medical history and clinical examination.
3. No medical history or sensitivity to any drug.

The study will incorporate three sessions of needleless mesotherapy for facial skin rejuvenation amongst the two groups.

Two study groups will be-

Group A (needleless PRP mesotherapy)

Group B (needleless serum(Vitamin C Hyaluronic acid mesotherapy)

Every session will be given for a time period of 45 minutes into the facial skin.

Follow up will be done after 1 week , 4 week and 6 week respectively.

The Global Esthetic Improvement scale and Linkert's patient satisfaction scale will be used to evaluate the scores preoperatively and on all the follow-ups.

- A skin hydration analyzer will be used for objective evaluation in all follow ups.
- All the evaluation will be done by a second operator.
- For safety, all the patients will be evaluated for skin reactions like skin rashes, eruptions and allergies.
- Patient will be seated in the dental chair and facial sites will be evaluated.

GROUP A- MESOTHERAPY WITH PR

- By venipuncture blood will be drawn and collected in tubes with in acid citrate dextrose (ACD) tubes. After that centrifugation of the blood using a 'soft' spin will be done and PRP will be prepared
- During each session after PRP prepration, it will be applied to the patients and mesotherapy will be provided. Before that EMLA(Eutectic mixture of local anaesthesia) cream will be applied on the facial skin surface 45 minutes before commencement of the session. Remove any amount of dirt from the skin using cotton pellets. A massage to relax the facial muscles might also be needed.
- Using a syringe or cotton pellets, the prepared PRP concentrate will be applied over the skin surface superficially. After that mesotherapy session will be started for 45 minutes. Coolant is applied to prepare the target facial area. Repeatedly, the application of PRP and mesotherapy will be done. Patients are instructed to use ice packs post operatively.
- Three sessions will be needed after every 1 week.

FOR GROUP B- VITAMIN C with HYALURONIC ACID

- Serum containing Vitamin C with Hyaluronic acid will be applied on the skin surface after deep cleansing the facial skin area. Using the same technique vitamin C with hyaluronic acid will be applied on the superficial skin surfaces for 45 minutes as for the PRP group. Patients are instructed to use ice packs post operatively.
- Three sessions will be needed after every 1 week.

- Follow up will be done on-

(D0)- The day of mesotherapy , using both grading scales, will be measured pre-operatively and skin hydration analyzer will be done..

(D1)-1st month post operatively, evaluation of esthetic improvement by GAIS scale, Linkert's scale and skin hydration analyzer will be done for all patients.

(D2)- 4TH month post operatively, evaluation of esthetic improvement by GAIS scale, Linkert's scale and skin analyzer.

(D3)-6TH month post operatively, evaluation of esthetic improvement by GAIS scale, Linkert's scale and skin analyzer.

The patients response will be recorded and evaluation will be done using two grading scales-

1.GAIS scale

2. Linkert's patient satisfaction scale.

Both the scales used in this study are pre- validated and freely available.Global esthetic improvement scale by comparing a live assessment of subject with degree 1 showing exceptional improvement and degree 5 showing worsened improvement

Degree 1	Exceptional improvement	Excellent corrective result
Degree 2	Very improved patient	Marked improvement of the appearance but not completely optimal
Degree 3	Improved patient	Improvement of appearance ,better compared with initial condition but a touch up is advised
Degree 4	Unaltered patient	The appearance substantially remains the same compared with the original condition.
Degree 5	Worsened patient	The appearance has worsened compared to the original condition.

Patient satisfaction will be recorded by using Linkert scale originally introduced by RENSIS LENKERT in 1932, A five point scale could be labeled according to agreement level. A well designated scale states the opinion,attitude or belief being in clear terms –

Data collection will be done by using Linkert's scale to evaluate patient satisfaction on the scale of 1 to 5 where 1 is not very satisfied and 5 is a satisfied patient.The data will be organized in a tabular form to evaluate the number of satisfied and unsatisfied patients.

List 1 . Scoring criteria

Score 5	Completely satisfied
Score 4	Somewhat satisfied
Score 3	Neither satisfied nor dissatisfied
Score 2	Somewhat dissatisfied
Score 1	Very dissatisfied

DATA ANALYSIS

Data will be analysed using Statistical Package for Social Sciences (SPSS) version 27. Categorical variables will be summarized as frequency. Continuous variables will be summarized as Means & Standard Deviation. Graphs will be prepared on Microsoft Excel.

Categorical variables will be compared by using Chi square test. Continuous variables will be checked for normal distribution. If it will achieve normality then Independent Sample t-test will

beused for intergroup comparison, else its non-parametric analogue i.e., .Mann Whitney U test will be used. The level of statistical significance will be set at 0.1.

RESULTS

The study was done to clinically evaluate and compare the efficacy and safety of needlessless mesotherapy for facial skin rejuvenation using PRP versus Vitamin C with hyaluronic acid. A null hypothesis was also put forward stating that there is no significant difference between the two groups.

Thirty two patients, Sixteen in Group A (Needless mesotherapy with PRP) and sixteen in Group B (Mesotherapy with Vitamin C hyaluronic acid) were taken in the study.

Group A, 16 patients, 5 males with mean age (35.4) years, Std. Deviation (6.1887) and 11 female patients with mean age of (31.5) years, Std. Deviation (8.2020).

Group B, 16 patients (all females) with a mean age of (29.18), Std. Deviation (4.2617) (Table 1 and Graph 1) , which met inclusion criteria were included in this study. These patients went through the mesotherapy procedure for facial skin rejuvenation. Aesthetic outcomes were assessed using two grading scales and skin hydration analyzer for objective evaluation. The data collection was analyzed and composed. Comparison was done on Linkert scale, GAIS score and hydration analyser.(Table 2 Graph 2)

1) ANALYSIS OF LINKERT SCALE-

INTERGROUP-

No significant difference was seen between the two groups at any interval between the two groups. The difference did not reach the level of level of significance. Hence both the treatment modalities were equally effective on patients . ($P < 0.05$) (Table 3 Graph 3)

INTRAGROUP-

GROUP A-

The patient satisfaction on Linkert scale at various intervals of time was compared using Friedmann test. The difference reached the level of significance at all the time intervals. Thus, the results showed that mesotherapy with PRP is an effective treatment modality when compared with the pre treatment values. (p>0.05)

GROUP B-

The patient satisfaction on Linkert scale at various intervals of time was compared using Friedmann test. Though a positive change in satisfaction level was present when compared to the pre treatment values but it failed to reach the level of significance. (P < 0.05) (Table 4 Graph 4)

2) ANALYSIS OF GAIS SCALE-

INTERGROUP-

No significant difference was seen between the two groups at any interval between the two groups.The difference did not reach the level of significance. Hence both the treatment modalities were equally effective on patients . (P > 0.05)(TABLE 5)(GRAPH 5)

INTRAGROUP-

GROUP A –

The GAIS at various intervals of time was compared using Friedmann test. The difference reached the level of significance. On pair wise comparison using Wilcoxon signed rank test, significant difference was seen between Pre op and Post op 6^{th} month values. Thus, the results showed that mesotherapy with PRP is an effective treatment modality when compared with the pre treatment values. (P value >0.05)

GROUP B

The GAIS at various intervals of time was compared using Friedmann test. The difference failed to reach the level of level of significance. Though the positive change in satisfaction level was present when compared to the pre treatment values but it failed to reach the level of significance. ($P < 0.05$)(TABLE 6)(GRAPH 6)

3) ANALYSIS OF HYDRATION

INTERGROUP-

The patient satisfaction on Hydration analyzer between group A and group B was compared using mann whitney u test. The difference failed to reach the level of significance. Hence both the treatment modalities were equally effective on patients . ($P < 0.05$)(TABLE 7)(GRAPH 7)

INTRAGROUP-

GROUP A-

The patient satisfaction on Hydration scale at various intervals of time was compared using Friedmann test. The difference reached the level of significance at all the time intervals. Thus, the results showed that mesotherapy with PRP is an effective treatment modality when compared with the pre treatment values. Indicating that needless mesotherapy with PRP shows positive outcome when compared to the pre treatment values and gives sufficient hydration to the skin. (P value > 0.05)

GROUP B

The hydration analyser at various intervals of time was compared using Friedmann test. The difference reached the level of significance, with higher being reported at Post op: 6^{th} month. Thus the results showed that mesotherapy with Hyaluronic acid with Vitamin C has significant difference between Pre op and Post op 6^{th} month. (P value > 0.05)(TABLE 8 GRAPH 8)

Hence, hydration showed positive outcome in both the groups.

In conclusion, we can state that both the treatment modalities are equally effective for hydration improvement using PRP and Hyaluronic acid with Vitamin C. The result also proves that there is no difference in the satisfaction level between group A and group B when intergroup comparison was done.

The results also proves that significant change from pre treatment values is seen in both the groups when intra group comparison was performed. But, the results proved that group A is better when compared to group B.

GROUPS	N	%
GROUP A: needleless PRP mesotherapy	16	50
GROUP B: needleless serum(Vitamin C Hyaluronic acid mesotherapy	16	50
TOTAL	32	100

Table 1: DEMOGRAPHIC PROFILE OF STUDY POPULATION

		N	Mean	SD	P[a] value
GROUP A	FEMALE	11	31.545	8.2020	.125 ns
	MALE	5	35.400	6.1887	
GROUP B	FEMALE	16	29.188	4.2617	NA
	MALE	16	3.438	.8921	
GROUP A		8	32.750	7.6463	0.114
GROUP B		8	29.188	4.2617	

Table 2- COMPARISON OF BOTH THE GROUPS WITH RESPECT TO MEAN AGE

		N	Mean	SD	MEAN DIFFERENCE	P^b value
PRE OP	GROUP A	16	3.063	.7719	3.5625	.239 ns
	GROUP B	16	3.438	.8921		
POST OP: 1st week	GROUP A	16	3.188	.8342	-0.3750	.239, ns
	GROUP B	16	3.500	.5164		
POST OP: 1st month	GROUP A	16	3.500	.8165	-.3125	.379,ns
	GROUP B	16	3.267	.7988		
POST OP: 4th month	GROUP A	16	3.500	.8165	0.233	0.564,ns
	GROUP B	15	3.313	.9465		
POST OP: 6th month	GROUP A	16	3.813	.6551	0.2875	0.323,ns
	GROUP B	16	3.063	.7719		

TABLE 3- COMPARISON OF PATIENT SATISFACTION ON LENKERT SCALE BETWEEN TWO GROUPS AT DIFFERENT INTERVALS OF TIME.

	GROUP A		GROUP B	
	Mean	SD	Mean	SD
Pre op	3.063	.7719	3.438	.8921
Post op: 1st week	3.438	.8921	3.500	.5164
Post op: 1st month	3.188	.8342	3.267	.7988
Post op: 4th month	3.500	.5164	3.313	.9465
Post op: 6th month	3.500	.8165	3.625	.6191
P[c]	**0.021*, sig**		**0.0660,ns**	
p[d]	Preop, Post op: 1st week < Post op: 6th month		NA	

TABLE 4- COMPARISON OF PATIENT SATISFACTION ON LENKERT SCALE FOR GROUP A AND GROUP B AT DIFFERENT INTERVALS OF TIME.

		N	Mean	SD	MEAN DIFFERENCE	P[b] value
PRE OP	GROUP A	16	3.063	.6801	0.2447	.171 ns
	GROUP B	16	2.688	.7042		
POST OP: 1st week	GROUP A	16	2.625	.6191	0.2795	.724, ns
	GROUP B	16	2.750	.9309		
POST OP: 1st	GROUP A	16	2.500	.6325	0.2016	.696,ns

month	GROUP B	16	2.375	.5000		
POST OP: 4th month	GROUP A	16	2.500	.8165	0.3023	0.867,ns
	GROUP B	15	2.438	.8921		
POST OP: 6th month	GROUP A	16	2.375	.8062	0.3272	0.926,ns
	GROUP B	16	2.438	1.0308		

TABLE 5- COMPARISON OF GAIS SCALE BETWEEN TWO GROUPS AT DIFFERENT INTERVALS OF TIME.

	GROUP A		GROUP B	
	Mean	SD	Mean	SD
Pre op	3.063	.6801	2.688	.7042
Post op: 1st week	2.625	.6191	2.750	.9309
Post op: 1st month	2.500	.6325	2.375	.5000
Post op: 4th month	2.500	.8165	2.438	.8921
Post op: 6th month	2.375	.8062	2.438	1.0308
P[c]	**0.024*, sig**		**0.381,ns**	
p[d]	Preop, Post op: 1st week > Post op: 6th month			

TABLE 6- COMPARISON OF GAIS SCALE BETWEEN TWO GROUPS AT DIFFERENT INTERVALS OF TIME

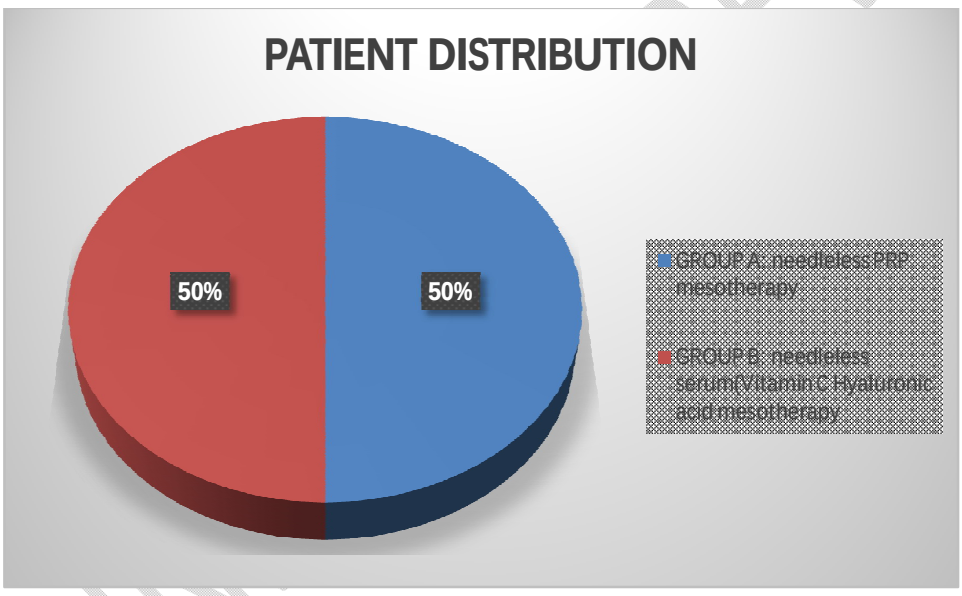
		N	Mean	SD	MEAN DIFFERENCE	P^b value
PRE OP	GROUP A	16	19.406	2.0984	0.2447	.696,ns
	GROUP B	16	19.475	3.8743		
POST OP: 1st week	GROUP A	16	20.356	3.2492	0.2795	.985, ns
	GROUP B	16	19.869	2.9955		
POST OP: 1st month	GROUP A	16	20.325	2.6941	0.2016	.590,ns
	GROUP B	16	20.900	3.0362		
POST OP: 4th month	GROUP A	16	22.656	3.6458	0.3023	0.897,ns
	GROUP B	15	22.194	2.6782		
POST OP: 6th month	GROUP A	16	23.044	2.7001	0.3272	0.724,ns
	GROUP B	16	23.275	1.8142		

TABLE 7- COMPARISON OF HYDRATION ANALYZER BETWEEN TWO GROUPS AT DIFFERENT INTERVALS OF TIME.

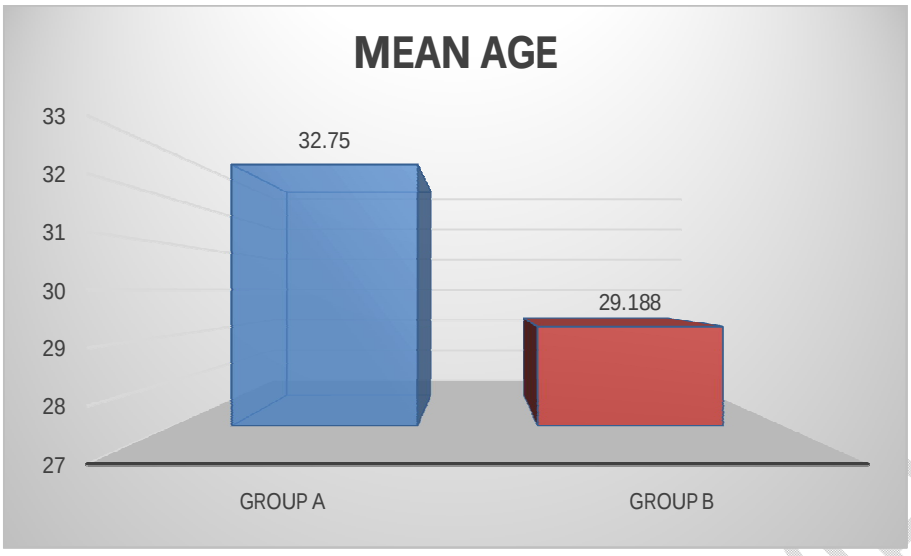
	GROUP A		GROUP B	
	Mean	SD	Mean	SD
Pre op	19.406	2.0984	19.475	3.8743
Post op: 1st week	20.356	3.2492	19.869	2.9955
Post op: 1st	20.325	2.6941	20.900	3.0362

month				
Post op: 4th month	22.656	3.6458	22.194	2.6782
Post op: 6th month	23.044	2.7001	23.275	1.8142
P[c]	**0.001*, sig**		**0.001*, sig**	
p[d]	Preop, Post op: 1st week, Post op: 1st month < Post op: 6th month		Preop, Post op: 1st week, Post op: 1st month < Post op: 6th month	

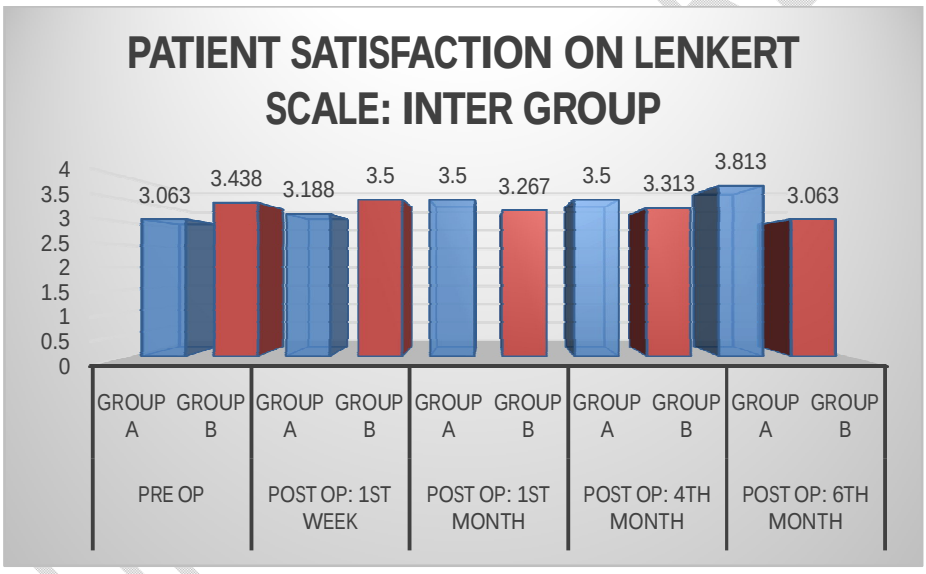
TABLE 8- COMPARISON OF HYDRATION ANALYZER FOR GROUP A AND GROUP B AT DIFFERENT INTERVALS OF TIME.



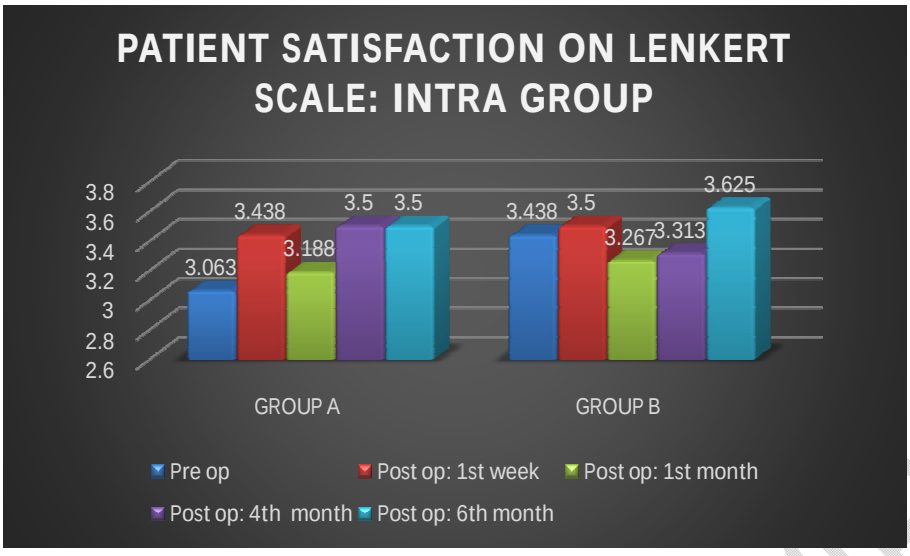
GRAPH 1- PATIENT DISTRIBUTION.



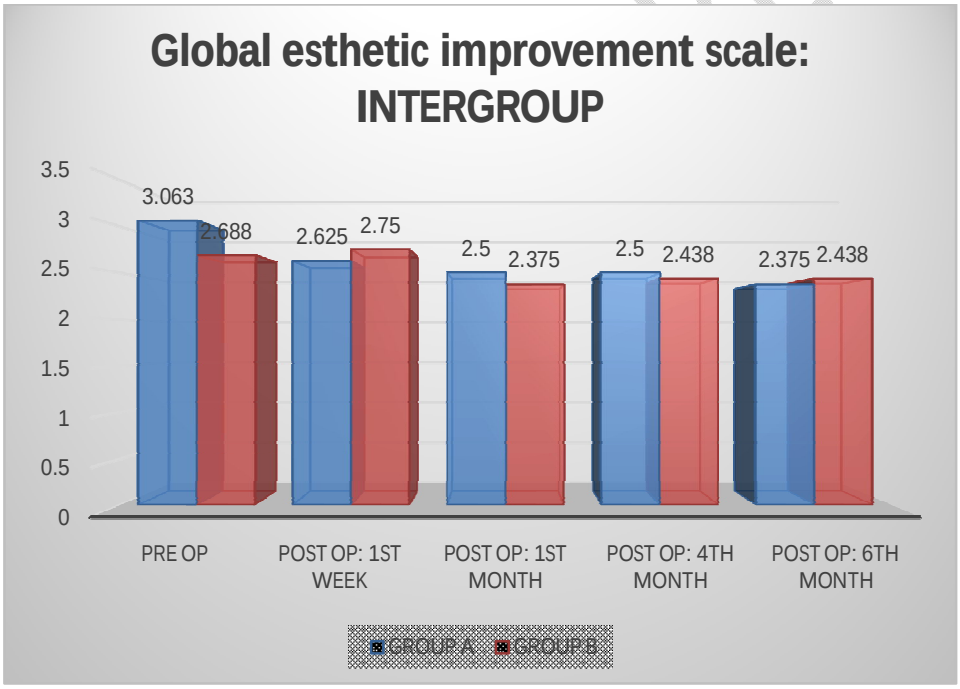
GRAPH 2- COMPARISON OF MEAN AGE AMONG BOTH THE GROUPS



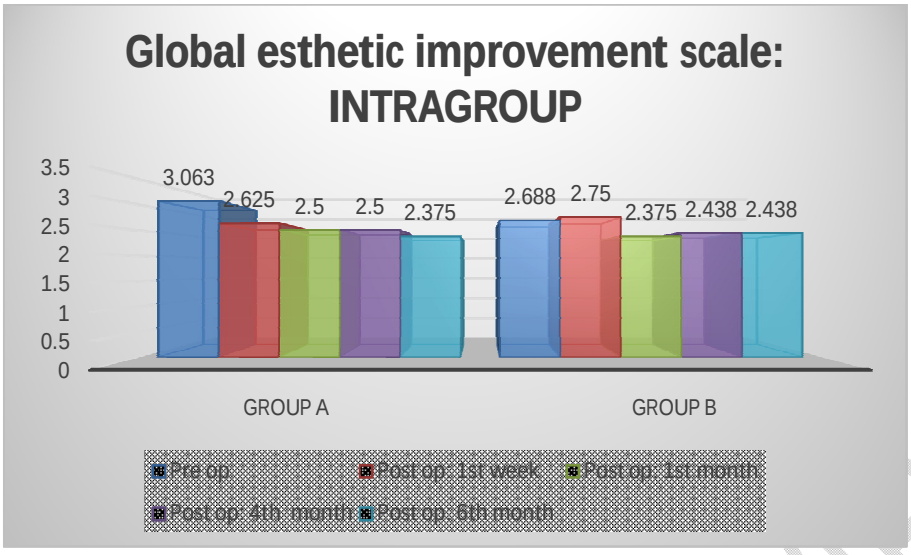
GRAPH 2- COMPARISON OF PATIENT SATISFACTION ON LENKERT SCALE BETWEEN TWO GROUPS AT DIFFERENT INTERVALS OF TIME



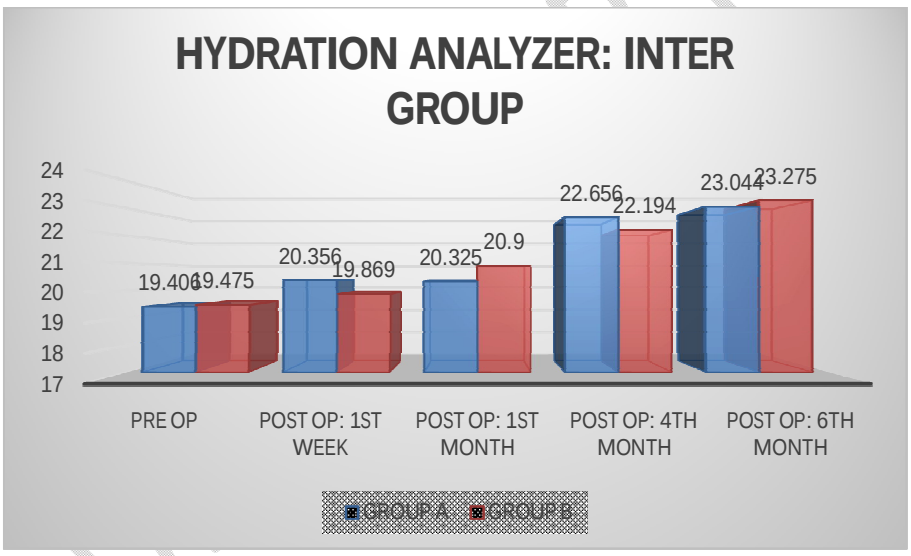
GRAPH 3- COMPARISON OF PATIENT SATISFACTION ON LENKERT SCALE FOR GROUP A AND GROUP B AT DIFFERENT INTERVALS OF TIME



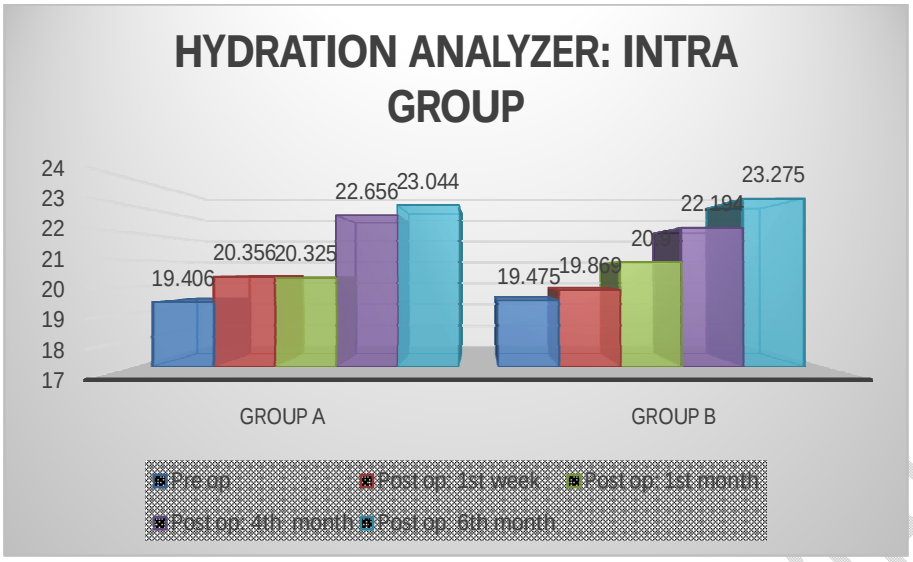
GRAPH 4- COMPARISON OF GAIS BETWEEN TWO GROUPS AT DIFFERENT INTERVALS OF TIME



GRAPH 5- COMPARISON OF GAIS BETWEEN TWO GROUPS AT DIFFERENT INTERVALS OF TIME



GRAPH 6- COMPARISON OF HYDRATION ANALYZER BETWEEN TWO GROUPS AT DIFFERENT INTERVALS OF TIME.



GRAPH 7- COMPARISON OF HYDRATION ANALYZER FOR GROUP A AND GROUP B AT DIFFERENT INTERVALS OF TIME.

DISCUSSION

UV radiation from the sun is the main environmental element contributing to dullness in human skin. The dermal connective tissue is most negatively impacted by the skin damage caused by solar radiation, which include faster collagen synthesis and degradation as well as heightened inflammatory processes[1]. These processes— Laxity, telangiectasia, wrinkles, colour changes, and coarseness, dryness, and loss of tensile strength—are directly to blame for the clinical appearance of photoaged skin. The preservation and restoration of youthful skin is the goal of mesotherapy for skin rejuvenation.

Mesotherapy increases the biosynthetic capacity of fibroblasts and the reconstruction of an optimal physiologic environment, the enhancement of cell activity[4], and the synthesis of collagen, elastin, and hyaluronic acid. Skin texture maintenance and restoration are the goals of mesotherapy in skin rejuvenation. Intradermal HA injection has been shown to boost fibroblast activity and tissue water retention in some clinical studies.

For the purpose of preserving and regaining youthful skin, the current study offers a key to minimally invasive skin rejuvenation technique's comparative clinical evaluation[3] using needleless mesotherapy with two formulations (platelet rich plasma and hyaluronic acid) [8].

Both hyaluronic acid and PRP are employed as alternatives for mesotherapy and are becoming well-liked in the treatment of facial skin renewal.

The current study supports mesotherapy with PRP as a potential treatment for facial skin rejuvenation, with hydration analyzer results significantly different from pre-treatment values.

A total of 32 patients were taken in the study which were divided into two groups. Group A consisted of 16 patients on which needless mesotherapy[9] was done using PRP and Group B consisted of 16 patients on which needless mesotherapy was done using Hyaluronic acid. The analysis were done using Linkert's , Global aesthetic improvement scale and Hydration analyser.

After the 6th month follow up using hydration analyser, significant difference was seen in both the groups (P value 0.001). Though in intergroup analysis there was a positive outcome when compared to the pre-treatment values but the results failed to reach the level of significance. Analysis of linkert scale showed significant differences in the intragroup comparison in Group A when compared to Group B.

Thus, the results showed that mesotherapy with PRP is an effective treatment modality when compared with the pre treatment values. Analysis of Global esthetic improvement scale also showed statistical difference in Group A when compared to the group B. The comparison was done using Wilcoxon signed rank test.

According to the findings of the current study, the treatment may have primarily affected the moisture of facial skin through increasing collagen synthesis. This suggests that long-term progress when hydration analysis was done on the 6th month follow up showed better treatment results.

A study conducted by Antonella Savoia et al as a clinical test of a new mesotherapy procedure for face rejuvenation using minimally invasive methods. Formulation A, which had hyaluronic acid along with vitamins, amino acids, minerals, coenzymes, and antioxidants; and Formulation B, which contained hyaluronic acid along with idebenone. The findings were consistent with our study, which found that minimally invasive mesotherapy had a statistically significant and durable impact on facial rejuvenation. It has been reported by Ozlem Karabudak Abuaf et al that when the mean optical densities (MOD) of PRP were compared to the MOD of pre-treatment, an 89.05

percent improvement was discovered. On the PRP side, the mean MOD of collagen fibres was unquestionably higher (p 0.001). According to our study, the PRP-to-saline improvement ratio was 1.93:1 (89.05% to 46.01%). Using numerous growth factors and cell adhesion molecules, Platelet Rich Plasma (PRP) promotes skin renewal, according to the findings of our study

Barbara Hersant et al conducted a prospective research to evaluate and look at the synergistic of hyaluronic acid and autologous platelet-rich plasma (a-PRP) injections on facial skin rejuvenation. They came to the conclusion that using a-PRP and HA in combination offers a highly significant increase in face look and skin elasticity compared to using a-PRP or HA alone.

Martine Baspeyras et al aimed to assess the efficacy of non reticulated HA-based mesotherapy on skin elasticity. There results stated that intradermally microinjected HA might be of value to improve suppleness of ageing skin. Their results were in accordance to our study stating that HA filler in sustainable in improving skin elastic parameters.

A study conducted by N. Vineeta et al , states that there is no significant difference in improvement of skin when Vitamin C mesotherapy when done in 10 patients with four sessions each. They evaluated the pre and post treatment photographs along with skin biopsies. The study shows similar results with our's in terms of pre and post treatment photographs but biopsies were not taken in our study. Mesotherapy alone with Vitamin C did not show improvement in our study as well.

Heba Gawdat et al when comparing between readymade growth factors and autologous platelet-rich plasma (PRP) found a significant improvement in the area where autologous PRP was used concluding that platelet-rich plasma is effective and safe for skin rejuvenation, comparable to readymade growth factors.

A study by Francesco Lacarrubba et al states that mesotherapy with HA may be an effective treatment for skin photoaging, as confirmed by ultrasound. Though, we only confirmed our results with Patient satisfaction scale and hydration analyser, our results showed intragroup significant difference when HA was used for rejuvenation.

Anne Grand-Vincent in their study claims that injection solution of the biosynthetic ability of fibroblasts is stimulated by tiny amounts of active substances (hyaluronic acid, vitamins, antioxidants), which also boost collagen and elastin formation and provide active necessary components for a fibroblasts environment. The investigation of dermis density revealed an increase

in dermal thickness and density, improving skin firmness with a considerable increase in dermis thickness (20%) and density (24%), indicating neocollagen activity.

On review of literature , similar comparisons between HA and PRP were not found previously. Thus the present study is unique as the comparison has been done between HA and PRP for the first time.

Advantage of this study is that both techniques (PRP and HA) are painless and minimally invasive with no major complications reported during the study.

Disadvantage of this study was the smaller sample size.Thus to be more conclusive the study can be conducted with a larger sample size.

The present study proves needless mesotherapy using PRP is a better treatment modality when compared to the mesotherapy using hyaluronic acid.

CONCLUSION

The study was done to compare the needleless mesotherapy using two formulations- HA and PRP. Patient satisfaction scale, Global aesthetic improvement scale and Hydration analyser was used to determine the results in our study.

The results of the study proves that amongst the two groups (Hyaluronic acid using PRP and Hyaluronic acid using Vitamin C), the clinical experience using Platelet Rich Plasma (PRP) was found to be better when compared with mesotherapy using hyaluronic acid alone.

Thus, it can be concluded that the stimulation of dermal fibroblast proliferation by PRP increased type I collagen and has the potential to promote the remodelling of skin. Considering limited studies on clinical efficacy and safety, further studies are required to investigate the mechanism and safety on these products before clinical application.

SUMMARY

The present study confirms that mesotherapy with PRP may be useful in the treatment of facial skin rejuvination, as supported by Hydration analyser showing significant changes when compared to the pre treatment values.

A total of 32 patients were taken in the study which were divided into two groups. Group A consisted of 16 patients on which needless mesotherapy[9] was done using PRP and Group B consisted of 16 patients on which needless mesotherapy was done using Hyaluronic acid. The analysis were done using Linkert's , Global aesthetic improvement scale and Hydration analyser.

The results proved that both the treatment modalities are equally effective for hydration improvement using PRP and Hyaluronic acid with Vitamin C. The result also proves that there is no difference in the satisfaction level between group A and group B when intergroup comparison was done.

The results also proves that significant change from pre treatment values is seen in both the groups when intra group comparison was performed. But, the results proved that group A is better when compared to group B.

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