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THE VALUE OF USING PLATELET RICH PLASMA DURING CAESAREAN SECTION TO ENHANCE SKIN WOUND HEALING IN PREGNANT DIABETIC WOMEN

By

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ABSTRACT

Background: Diabetes is an independent risk factor for bad wound healing during pregnancy. Platelet rich plasma, PRP is a volume of blood having a high concentration of platelets which improves the adhesive properties and the process of wound healing.

Objective: To evaluate the value of using platelet rich plasma during caesarean section to enhance wound healing in pregnant diabetic women.

Methods: This prospective randomized control study was carried out on 60 patients and were divided into two groups, each had 30 patients. The control group included 30 patients with wounds that were cleaned with normal saline and the study group included 30 patients with wounds that were cleaned with normal saline with PRP solution injected in subcutaneous tissue of wound after closure of the sheath. The patients were examined by the physician on day 3, day 7 and day 30 after the procedure. Pain was evaluated by the visual analog scoring system (VAS). The wound healing was evaluated by REEDA scale.

Results: Ecchymosis, discharge, Approximation, oedema score, redness scores (REEDA scale) were significantly improved in in the PRP group compared to the control group. VAS score was significantly decreased in the PRP group compared to the control group after 3rd day post CS. Cosmetic appearance was significantly improved in the PRP group compared to the control group on the 30th day post CS.

Conclusion: PRP seems to be an efficient therapeutic method for wound healing (as revealed by the REEDA score) regarding redness, edema, discharge, and ecchymosis. In addition, better wound healing and cosmoses were recorded in PRP group compared to the control group.

Keywords: Cesarean Section, Platelet Rich Plasma, REEDA scale, Pregnant Diabetic Women

INTRODUCTION

Cesarean section (CS) is a major life-saving surgical obstetric procedure that is highly effective in saving the lives of both the mother and the infant; however, it is recommended only for medically indicated causes. For over a decade, there has been a rapid increase in CS delivery rates across the globe ***(Abdelbaset et al., 2022)***.

Globally, the number of cesarean births recorded each year is more than 18 million, accounting for approximately 19.1% of total births. These numbers have increased from just 7% in 1990 and are projected to increase to nearly one-third (29%) of all births by 2030 ***(Pandey et al., 2023)***.

Patients with diabetes mellitus are at increased risk of bad outcome in pregnancy, including abortion, congenital anomalies, growth abnormalities, intrauterine fetal death, gestational hypertension, preeclampsia, birth injury, and operative delivery. Diabetes is an independent risk factor for bad wound healing during pregnancy. Other risk factors involved in poor wound healing include, anemia, immunosuppressive medications, malnutrition, hypoxemia, chronic medical illness, prolonged surgery and obesity ***(Ornoy et al., 2021)***.

The bad wound healing among diabetic women may be related to high glucose level which lower the ability of immune response to fight organisms and associated tissue hypoxia secondary to vasculopathy especially in long standing diabetics with associated tissue ischemia and reduced immune response and improper wound healing. The risk of wound infection and gapping is increased 4-5 times after elective and non-elective CS ***(Liu et al., 2022)***.

With the development of regenerative medicine, platelet-rich plasma (PRP) has been suggested to confer superior efficacy for wound healing to conventional therapies. PRP is a product derived from fresh whole blood that contains a high concentrate of platelets, which can release a variety of highly concentrative growth factors, including PDGF, transforming growth factor (TGF)-β, VEGF, epidermal growth factor (EGF), fibrinogen, osteocalcin, and insulin-like growth factor (IGF). It is noteworthy that these factors are essential for the regulation of important cellular processes involved in the healing of wounds, including cell proliferation, chemoattractant, and cell metabolism ***(Kawase, 2015)***.

Platelet-rich plasma (PRP) has been used for more than a decade in injectable or gel form, and many studies have demonstrated that PRP stimulates regeneration of the soft tissues (fat, skin, and mucosa) as well as the hard tissues (tendons and bones) ***(Cecerska-Heryć et al., 2022)***.

This study aimed to evaluate value of using platelet rich plasma during caesarean section to enhance skin wound healing in pregnant diabetic women.

PATIENTS AND METHODS

This prospective randomized control study was carried out at obstetrics and gynecology Department, Al-Azhar University Hospital at New Damietta on 60 patients in the period from Sept 20th,2023 to

Sept 20th, 2024. Samples were collected by the systematic random method. The study design was approved by the Local Ethics Committee and written informed consents were obtained. This study included pregnant diabetic women at term with age between 18 to 45, with gestational or pre-gestational diabetics with proper glycemic control, with average body mass index (25:34 kg/m^2), without other associated medical condition and planned caesarean section. But we excluded patients with anemia or platelet disorder, patients with medical disorders as cardiac patients or any immune disorders, patients with placenta previa, with rupture membrane, with multiple pregnancies and with infections eg; (chorioamnionitis, skin infections at site of incision).

The candidate women were divided randomly by closed envelope method into two groups, each contain 30 patients. The control group included 30 patients with wounds that were cleaned with normal saline and the study group included 30 patients with wounds that were cleaned with normal saline with PRP solution injected in subcutaneous tissue of wound after closure of the sheath.

Each subject was subjected to history taking including age, parity, residence, socioeconomic status, number of gestations, CS indication, diabetes onset and medication, clinical examination including vital signs, heart rate, respiratory rate, blood pressure and temperature, abdominal examination and obstetric ultrasound and investigations including CBC, coagulation blood profile, and blood sugar.

Preparation of PRP

The sample was obtained and prepared within 6 hours preoperative. Venous blood (30 ml) was drawn from the patient arm in anticoagulant-containing tubes, the recommended temperature during processing is 21^0c - 24^0c to prevent platelet activation during centrifugation of the blood. The blood was centrifuged at 1,200 rpm for 12 minutes. The blood was separated into three layers: (1) an upper layer that contains platelets and white blood cells, (2) an intermediate layer (the buffy coat) that is rich in white blood cells and (3) a bottom layer that contains red blood cells. The upper and buffy intermediate layers were transferred to an empty sterile tube, the plasma was centrifuged again at 3,300 rpm for 7 minutes to help with formation of soft platelets (erythrocytes & platelets) at the bottom of the tube (pellets). The upper two thirds of the plasma was discarded because it was platelet-poor plasma. Pellets were homogenized in the lower third (5ml) of the plasma to create the PRP; the PRP was ready now for injection, approximately 30 ml of venous blood yields 3-5 ml of PRP.

The prepared PRP solution was transferred within sterile wide pore syringe from the laboratory to the operating theatre. The Caesarean section was done by the usual routine method but before starting and while the anesthetist began, the patient was injected by 1 gm ceftriaxone in 10 cm saline slowly intravenously. The prepared PRP was injected over the subcutaneous space before skin closure.

Postoperative, all patients in the two groups received the same treatment as

follows, 1 gm ceftriaxone daily, metronidazole 500mg/12h iv and paracetamol 500mg\12h iv for 4 days post C.S with no further treatment. The patients were examined by the physician on day 3, day 7 and day 30 after the procedure. Pain was evaluated by the visual analog scoring system (VAS). The wound healing was evaluated by REEDA scale ***(Alvarenga et al., 2015)***.

REEDA as a descriptive scale has 4 points in a categorical score that measures 5 items of healing: Redness (hyperemia), Edema, Ecchymosis, Discharge, and Approximation of the wound edges (coaptation). Each item is rated on a scale of 0 to 3, on day 7and day 30 postpartum. Total scores may range from 0 to 15. A lower score indicates better healing.

Ethical Consideration

The study protocol was approved by the Research Ethics Committee of Faculty of Medicine Al-Azhar University. Before starting the field of work, informed oral consents were taken from the patients. Research data and samples were used exclusively for the sake of this research. The steps of the study, the aims, the potential benefits and hazards were discussed to the patients.

Statistical Analysis

The collected data were coded, processed and analyzed using SPSS program (Version 25) for windows. Descriptive statistics were calculated to include means, standard deviations, medians, ranges, and percentages. For continuous variables, independent t-tests were performed to compare the means of normally distributed data, while Mann–Whitney U tests was used to compare the median differences of the data that were not normally distributed, and chi-square test for categorical data. P values ≤ 0.05 were used as indicators of statistical significance differences.

RESULTS

Table (1) demonstrates the comparison of demographic characters and types of diabetes between studied groups. There were no statistically significant differences between both groups regarding age, BMI, type of DM, HBA1C and RBS at CS.

Table (1): Comparison of demographic characters and type of diabetes between studied groups

	Control group N=30	Study group N=30	Test of significance
Age/ years Mean ±SD	29.70±5.86	28.73±5.48	t=0.660 p=0.512
BMI (Kg/m^2) Mean ±SD	28.99±2.91	29.73±3.22	t=0.927 p=0.358
Type of DM			
Gestational	12(40%)	10(33.3%)	χ^2=0.515
IDDM	13(43.3%)	13(43.3%)	P=0.773
NIDDM	5(16.7%)	7(23.3%)	
HBA1C Mean ±SD	6.38±0.12	6.42±0.12	t=1.54 p=0.129
RBS at CS Mean ±SD	136.87±7.62	133.9±23.31	t=0.663 p=0.510

t: Student t test, χ^2: Chi-Square test

Table **(2)** display the comparison of the *redness* score during follow-up between the studied groups. On the 3rd day, there was a highly statistically significant increase in the score in the study group compared to the control group (P<0.001). On the 7th day, both groups demonstrated insignificant differences in the score. On the other hand, on the 30th day, there was a highly statistically significant increase in the score in the control group compared to the study group (P<0.001). In addition, intergroup comparison revealed that there were highly statistically significant increases in the score in the control group and highly statistically significant decreases in the score in the study group in a gradual manner from the 3rd day to the 30th day (P<0.001). Regarding *Oedema* score during follow-up between the studied groups, there were statistically significant differences in score between both groups at all follow-up periods, being significantly decreased in the control group on the 3rd day compared to the study group and significantly increased in the control group on the 30th day compared to the study group (P<0.05). Likewise, intergroup comparisons revealed a highly statistically significant difference between all the follow-up periods (P<0.001).

Table (2): Comparison of redness and oedema score during follow up between studied groups

	Rating scale	Control group N=30(%)	Study group N=30(%)	Comparison between studied groups	Control group N=30(%)	Study group N=30(%)	Comparison between studied groups
		Redness			Oedema		
On 3rd day	Score 0 Score 1 Score 2 Score 3	17(56.7) 13(43.3) 0 0	0 3(10) 14(46.7) 13(43.3)	χ^2=50.25 P<0.001*	20(66.7) 10(33.3) 0 0	1(3.3) 3(10) 22(73.3) 4(13.3)	χ2=46.96 P=0.001*
On 7th day	Score 1 Score 2 Score 3	21(70) 9(30) -	19(63.3) 11(36.7) -	χ^2=0.300 P=0.584	17(56.7) 12(40) 1(3.3)	26(86.7) 4(13.3) 0	χ2=6.88 P=0.03*
On 30th day	Score 0 Score 1 Score 2 Score 3	0 2(6.7) 21(70) 7(23.3)	22(73.3) 8(26.7) 0 0	χ^2=53.60 P=0.001*	0 1(3.3) 19(63.3) 10(33.3)	28(93.3) 2(6.7) 0 0	χ2=57.33 P=0.001*
Comparison of follow up readings		P1<0.001* P2<0.001* P3<0.001*	P1<0.001* P2<0.001* P3<0.001*		P1<0.001* P2<0.001* P3<0.001*	P1<0.001* P2<0.001* P3<0.001*	

χ^2: Chi-Square test, *Statistically significant,
p1: difference between 3& 7 days, p2: difference between 3 & 30 days, p3: difference between 7&30 days, used test Wilcoxon signed rank test

Table **(3)** demonstrate comparison of *ecchymosis* score during follow-up between studied groups. There were highly statistically significant differences in score between both groups at all follow-up periods, being significantly decreased in the control group on the 3rd day compared to the study group and significantly increased in the control group on the 30th day compared to the study group (P<0.001). Likewise, intergroup comparisons revealed a highly statistically significant difference between all the follow-up periods (P<0.001).

Regarding *discharge* score during follow up between studied groups, there were statistically significant differences in score between both groups at all follow-up periods, being significantly decreased in the control group on the 3rd day compared to the study group and significantly increased in the control group on the 30th day compared to the study group (P<0.05). Likewise, intergroup comparisons revealed a highly statistically significant difference between all the follow-up periods (P<0.001).

Regarding a*pproximation* score during follow-up between studied groups, there were statistically significant differences in score between both groups at all follow-up periods, being significantly decreased in the control group on the 3rd day compared to the study group and significantly increased in the control group on the 30th day compared to the study group (P<0.05). Likewise, intergroup comparisons revealed a highly statistically significant difference between all the follow-up periods (P<0.001).

Table (3): Comparison of ecchymosis, discharge and approximation score during follow up between studied groups

	Rating scale	Control group N=30(%)	Study group N=30(%)	Comparison between studied groups	Control group N=30(%)	Study group N=30(%)	Comparison between studied groups	Control group N=30(%)	Study group N=30(%)	Comparison between studied groups
		Ecchymosis			Discharge			Approximation		
On 3rd day	Score 0 Score 1 Score 2 Score 3	27(90) 3(10) 0 -	14(46.7) 14(46.7) 2(6.7) -	χ^2=13.24 P=0.001*	29(96.7) 1(3.3) 0 0	1(3.3) 0 18(60) 11(36.7)	χ2=56.13 P=0.001*	25(83.3) 4(13.3) 0 1(3.3)	0 12(40) 17(56.7) 1(3.3)	χ2=46.0 P=0.001*
On 7th day	Score 0 Score 1 Score 2	- 27(90) 2(10)	- 15(50) 15(50)	χ^2=11.42 P=0.001*	0 21(70) 9(30)	1(3.3) 27(90) 2(6.7)	χ2=6.21 P=0.045*	0 19(63.3) 11(36.7)	3(10) 24(80) 3(10)	χ2=8.15 P=0.017*
On 30th day	Score 0 Score 1 Score 2 Score 3	0 9(30) 21(70) -	11(36.7) 19(63.3) 0 -	χ^2=35.57 P=0.001*	0 0 17(56.7) 13(43.3)	28(93.3) 2(6.7) 0 0	χ2=60 P=0.001*	0 4(13.3) 15(50) 11(36.7)	29(96.7) 1(3.3) 0 0	χ2=56.8 P=0.0001*
Comparison of follow up readings		P1<0.001* P2<0.001* P3<0.001*	P1<0.001* P2<0.001* P3<0.001*		P1<0.001* P2<0.001* P3<0.001*	P1<0.001* P2<0.001* P3<0.001*		P1<0.001* P2<0.001* P3<0.001*	P1<0.001* P2<0.001* P3<0.001*	

χ^2: Chi-Square test, *Statistically significant,
p1: difference between 3& 7 days, p2: difference between 3 & 30 days, p3: difference between 7&30 days, used test Wilcoxon signed rank test

Table **(4)** demonstrate a comparison of REEDA total score during follow up between studied groups. There were highly statistically significant differences between both groups regarding REEDA total score at all follow up periods being significantly decreased in the study group and significantly increased in the control group (P<0.001). In addition, within group comparisons revealed highly statistically significant increases in REEDA total score from the 3rd day to the 30th day and highly statistically significant decreases in REEDA total score from the 3rd day to the 30th day (P<0.001). Regarding VAS score during follow up between studied groups, there were highly statistically significant differences between both groups regarding VAS score at all follow up periods being significantly decreased in the study group and significantly increased in the control group (P<0.001). In addition, within group comparisons revealed highly statistically significant increases in VAS score from the 3rd day to the 30th day and highly statistically significant decreases in VAS score from the 3rd day to the 30th day (P<0.001).

Table (4): Comparison of REEDA total and VAS scores during follow up between studied groups

REEDA total score	Control group N=30	Study group N=30	Comparison between studied groups	Control group N=30	Study group N=30	Comparison between studied groups
	REEDA total score			VAS score		
On 3rd day Median (min-max)	1(0-7)	9(2-12)	Z=6.6 P<0.001*	5(4-7)	8(6-10)	Z=6.12 P<0.001*
On 7th day Median (min-max)	6(5-11)	6(3-8)	Z=0.884 P=0.377	7(5-8)	4(2-6)	Z=6.41 P<0.001*
On 30th day Median (min-max)	11(7-14)	1(0-3)	Z=6.72 P<0.001*	9(8-10)	1(1-3)	Z=6.82 P<0.001*
Comparison of follow up readings	P1<0.001* P2<0.001* P3<0.001*	P1<0.001* P2<0.001* P3<0.001*		P1<0.001* P2<0.001* P3<0.001*	P1<0.001* P2<0.001* P3<0.001*	

Z: Mann Whitney U test, *Statistically significant,
p1: difference between 3& 7 days, p2: difference between 3 & 30 days, p3: difference between 7&30 days, used test Wilcoxon signed rank test

Table **(5)** demonstrates the comparison of cosmetic appearance between the studied groups. There was a highly statistically significant improvement in the cosmetic appearance between both groups being significantly improved in the study group p<0.001 (76.6% of cases were satisfied about wound cosmetic appearance) while only 40% of control group were satisfied and 3 patients among control group needed secondary sutures.

Table (5): Comparison of Cosmetic appearance between studied groups

Cosmetic appearance	Control group N=30(%)	Study group N=30(%)	Comparison between studied groups
Satisfied	12(40)	23(76.6)	χ^2 =60
Not satisfied	18(60)	7(23.3)	P<0.001*

DISCUSSION

Patients with diabetes mellitus are at increased risk of bad outcome in pregnancy, including abortion, congenital anomalies, growth abnormalities, intrauterine fetal death, gestational hypertension, preeclampsia, birth injury, and operative delivery ***(Kamel, 2018)***. Diabetes is an independent risk factor for bad wound healing during pregnancy. Impaired healing in diabetes is the result of a complex pathophysiology involving vascular, neuropathic, immune, and biochemical components ***(Spampinato et al., 2020)***.

The bad wound healing among diabetic women may be related to high glucose level

which lowers the ability of immune response to fight organisms and associated tissue hypoxia secondary to vasculopathy especially in long standing diabetics with associated tissue ischemia and reduced immune response and improper wound healing. The risk of wound infection and gapping is increased 4-5 times after elective and non-elective CS ***(Kamel, 2018)***.

The aim of the current study was to evaluate value of using platelet rich plasma during caesarean section to enhance wound healing in pregnant diabetic women. Candidate women were divided randomly into two groups (n = 30), the control group in which the wounds were cleaned with normal saline and the study group in which wounds were cleaned with normal saline, and PRP solution was injected in subcutaneous tissue of the wound after closure of the sheath. Regarding the demographic characters, the present study displayed that there were no statistically significant differences between both groups regarding age, BMI, type of DM, HBA1C and RBS at CS. Such outcomes indicated that both groups were comparable and such factors did not interfere with net results of the study.

Regarding the comparison of the redness score, the current study demonstrated that on the 3rd day, there was a highly statistically significant increase in the score in the study group compared to the control group ($P<0.001$). On the 7^{th} day, both groups demonstrated insignificant differences in the score. On the other hand, on the 30th day, there was a highly statistically significant increase in the score in the control group compared to the study group ($P<0.001$). In addition, the intergroup comparison revealed that there were highly statistically significant increases in the score in the control group and highly statistically significant decreases in the score in the study group in a gradual manner from the 3rd day to the 30^{th} day ($P<0.001$).

Concerning oedema score, the current study displayed that there were statistically significant differences in score between both groups at all follow-up periods, being significantly decreased in the control group on the 3rd day compared to the study group and significantly increased in the control group on the 30th day compared to the study group ($P<0.05$). Likewise, intergroup comparisons revealed a highly statistically significant difference between all the follow-up periods ($P<0.001$).

Regarding ecchymosis score, the current study displayed that there were highly statistically significant differences in score between both groups at all follow-up periods, being significantly decreased in the control group on the 3rd day compared to the study group and significantly increased in the control group on the 30^{th} day compared to the study group ($P<0.001$). Likewise, intergroup comparisons revealed a highly statistically significant difference between all the follow-up periods ($P<0.001$).

Concerning discharge score, the current study reported that there were statistically significant differences in score between both groups at all follow-up periods, being significantly decreased in the control group on the 3rd day compared to the study group and significantly increased in the control

group on the 30th day compared to the study group (P<0.05). Likewise, intergroup comparisons revealed a highly statistically significant difference between all the follow-up periods (P<0.001).

In terms of approximation score, the present study demonstrated that there were statistically significant differences in score between both groups at all follow-up periods, being significantly decreased in the control group on the 3rd day compared to the study group and significantly increased in the control group on the 30th day compared to the study group (P<0.05). Likewise, intergroup comparisons revealed a highly statistically significant difference between all the follow-up periods (P<0.001).

Concerning REEDA total score, the current study illustrated that there were highly statistically significant differences between both groups regarding REEDA total score at all follow up periods being significantly decreased in the study group and significantly increased in the control group (P<0.001). In addition, within group comparisons revealed highly statistically significant increases in REEDA total score from the 3rd day to the 30th day and highly statistically significant decreases in REEDA total score from the 3rd day to the 30th day (P<0.001).

In the same line, ***Tehranian et al., (2016)*** conducted a randomized controlled trial, on 140 patients in Tehran, for elective cesarean surgery. The patients were randomly assigned into two groups. The intervention group received PRP after surgery, whereas the control group received the usual care. They revealed at the end of study, the PRP group showed a greater reduction in the edema ecchymosed discharge approximation (REEDA) score compared to the control group (85.5% reduction in the PRP group; 72% in the control group) (P < 0.001).

Likewise, ***Kamel (2018)*** conducted a randomized controlled study done on 120 diabetic women at full term planned for elective CS recruited who were divided into 2 groups, one control group and one study group where PRP was applied. They demonstrated a significant difference between wound healing in favor of PRP group (P<0.0001) in REEDA assessment scoring. Their assessment tools were REEDA scoring system to detect local wound changes as redness, edema, ecchymosis, discharge and approximation of the wound They showed that there was a significant difference between study and control group, but at 1st day the wound of PRP group showing more redness, edema and oozing discharge than the control group with p value 0.0001, however in the next following days 7 and 30, the PRP showing higher significant difference with more improvement of the wound REEDA scaling than the control group with p value less than 0.0001, there were 12 cases of gabbed wound in group 1, 8 of them were managed conservatively while other 4 cases needed secondary sutures, however there was no cases of gabbing in group 2 (p <0.0001).

In agreement, ***Elrahman et al., (2023)*** conducted another Egyptian study on a total of 100 patients underwent elective Cesarean Section received autologous Platelet-Rich Plasma (PRP) as intervention, and 100

subjects act as a control group who were undergone elective Cesarean Section who didn't receive autologous PRP. They displayed that REEDA Score was lower in the PRP group than in the control group.

Regarding VAS score, the present study displayed that there were highly statistically significant differences between both groups regarding VAS score at all follow up periods being significantly decreased in the study group and significantly increased in the control group (P<0.001). In addition, within group comparisons revealed highly statistically significant increases in VAS score from the 3rd day to the 30th day and highly statistically significant decreases in VAS score from the 3rd day to the 30th day (P<0.001).

Also, ***Tehranian et al., (2016)*** displayed that patients treated with PRP experienced a 93% reduction in the VAS score at the end of follow-up, but the control group only observed a 79% reduction (P < 0.001).

Barwijuk et al., (2024) conducted his study on a total of 46 patients who underwent cesarean sections (CS) and were divided into an interventional group, which included 23 women who used the PRP and 23 in the placebo group. They revealed that there was no difference in the pain intensity assessment on the VAS recorded after surgery, but PRP patients required fewer paracetamol doses per day than the control group

In terms of cosmetic appearance, the present study revealed that there was a highly statistically significant improvement in the cosmetic appearance between both groups being significantly improved in the study group (76.6% of cases revealed good cosmetic appearance and high patient satisfaction) compared to the control group (60% of them were not satisfied about cosmetic appearance, and 3 of them needed 2ry sutures).

Kamel (2018) found that the scar showed better results with good healing and better cosmetic appearance together with better pain tolerability after day one postoperatively. In the same line, ***Tehranian et al., (2016)*** revealed that there was a statistically significant improvement in the VSS Scores in PRP group compared to the control group (P<0.05). Similarly, ***Barwijuk et al., (2024)*** displayed that PRP application during CS significantly improved wound healing in both short- and long-term assessment. Also, ***Elkhouly et al., (2021)*** displayed that compared with the control group, the PRP group had a significantly greater reduction in the VSS score beginning on the seventh day (3.71 ± 0.99 vs. 4.67 ± 1.25, $p < 0.001$), and continued till 6 months.

In accordance, in the context of lower extremity diabetic skin ulcers, ***Fang et al., (2024)*** reported that PRP was associated with a higher rate of wound healing (OR, 3.23; 95% CI, 2.42, 4.31 p < 0.0001). Likewise ***He et al., (2022)*** demonstrated the same effect in terms of diabetic foot ulcer.

CONCLUSION & RECOMMENDATIONS

In the context of DM cases undergoing CS, PRP seems to be an efficient therapeutic method for wound healing (as revealed by the REEDA score) regarding redness,

edema, discharge, and ecchymosis. In addition, better wound healing and cosmoses were recorded in PRP group compared to the control group. The results of our study confirmed the results of most of previous studies about the efficacy of PRP technique in promoting wound healing and preventing complications so. We recommend using the PRP technique with caesarean section especially with diabetic women to improve wound healing process and to prevent wound complications after caesarean section.

Conflict of interest

All authors have no conflicts of interest that are directly relevant to the content of this review.

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قيمة إستخدام البلازما الغنية بالصفائح الدموية أثناء الولادة القيصرية لتعزيز التئام جروح الجلد لدي النساء الحوامل المصابات بداء السكري

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خلفية البحث: يؤثر مرض السكري على التئام الجروح أثناء الحمل. قد يكون سوء التئام الجروح بين النساء المصابات بمرض السكري مرتبطًا بمستويات الجلوكوز المرتفعة التي تقلل من قدرة الاستجابة المناعية على محاربة الميكروبات ونقص الأكسجين في الأنسجة المرتبط بالاعتلال الوعائي وخاصة في مرضى السكري منذ فترة طويلة مع نقص تروية الأنسجة وانخفاض الاستجابة المناعية والتئام الجروح بشكل غير صحيح. يزداد خطر إصابة الجرح وظهور الفجوات اربع الى خمس مرات بعد الولادة القيصرية.

البلازما الغنية بالصفائح الدموية هو حجم من الدم يحتوي على تركيز عالٍ من الصفائح الدموية مما يحسن خصائص الالتصاق وعملية التئام الجروح. بعد تطبيق البلازما الغنية بالصفائح الدموية يحفز التئام الجروح عن طريق إطلاق مواد التئام الأنسجة ذات التركيز العالي من الصفائح الدموية مما يسرع التئام الجروح ويحمي من العدوى. يستخدم البلازما الغنية بالصفائح الدموية في شكل هلام أو كحقن مع نتائج واعدة في التئام الجروح بشكل صحيح في كل من الأنسجة الرخوة (الدهون والجلد والغشاء المخاطي) وكذلك الأنسجة الصلبة (الأوتار والعظام).

الهدف من البحث: الهدف من الدراسة الحالية هو تقييم قيمة استخدام البلازما الغنية بالصفائح الدموية أثناء الولادة القيصرية لتعزيز التئام الجروح لدى النساء الحوامل المصابات بالداء السكري.

مواد وطرق البحث: تم تقسيم النساء عشوائيًا إلى مجموعتين (العدد = 30)، المجموعة الضابطة التي تم فيها تنظيف الجروح بمحلول ملحي عادي ومجموعة الدراسة التي تم فيها تنظيف الجروح بمحلول ملحي عادي وحقن محلول البلازما الغنية بالصفائح الدموية في الأنسجة تحت الجلد للجرح.

نتائج البحث:

- لم يتم تسجيل أي اختلافات كبيرة بين المجموعتين فيما يتعلق بجميع الخصائص الديموغرافية.
- تحسنت الكدمات والإفرازات والتقريب و مقياس ريدا ودرجة الوذمة ودرجات الاحمرار بشكل ملحوظ في مجموعة الدراسة مقارنة بالمجموعة الضابطة.
- انخفضت درجة مقياس الالم بشكل ملحوظ في مجموعة الدراسة مقارنة بالمجموعة الضابطة.
- تحسن المظهر التجميلي بشكل ملحوظ في مجموعة الدراسة مقارنة بالمجموعة الضابطة.

الاستنتاج: في سياق حالات مرض السكري الخاضعة لعملية القيصرية تبين أن البلازما الغنية بالصفائح الدموية هي طريقة علاجية فعالة لالتئام الجروح (كما كشف مقياس ريدا) فيما يتعلق بالاحمرار والوذمة والإفرازات والكدمات. بالإضافة إلى ذلك، تم تسجيل التئام الجروح وتحسن في التئام الجروح في البلازما الغنية بالصفائح الدموية مقارنة بالمجموعة الضابطة.

الكلمات الافتتاحية: ولادة قيصرية – بلازما غنية بالصفائح الدموية- مقياس ريدا – نساء حوامل مصابات بالسكري