Western European Journal of Medicine and Medical Science
Volume 2, Issue 8, August, 2024
https://westerneuropeanstudies.com/index.php/3
ISSN (E): 2942-1918 Open Access| Peer Reviewed

PLATELET-RICH PLASMA EFFICACY IN EPISIOTOMY WOUNDS

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ABSTRACT

During vaginal birth, 85% of females suffer from perineal trauma. A major chronic effect of perineal trauma is pain. Prejudice against vaginal birth is the poor life quality and pain. A new treatment for perineal trauma and pain is Platelet rich plasma. The aim of the current research was to find healing advantages of Platelet rich plasma in episiotomy wounds, concerning the time of healing, signs of infection, and intensity of pain. A clinical randomized research was conducted in Tikrit Teaching Hospital, the of Obstetrics and Gynecology Department, in a period between October 2023 until June 2024. The women will be randomized into either group of Platelet rich plasma (30 females) or (30 females) group of control. Facts collected through: standard questionnaire contain the information of sociodemographic characteristics, obstetrical History, and medical history. Assessment of wound healing by: visual analogue scale, Edema, Redness, Ecchymosis. scale, approximation, and Scar Scale of Vancouver, at basal day one, 7th , 14 th, and 28th day. The after treatment Vancouver Scar Scale score was significantly lower among group of Platelet rich plasma (0.45±0.2) than group of control (1.3±0.6). The decrement in the Vancouver Scar Scale score was significantly higher among the group of Platelet rich plasma (-1.85) group than the group of control (-1.3). The commonest side effect of Platelet rich plasma was erythema at site of injection 14(46.7%), followed by ecchymosis 4(13.3%) which resolve after 1 week, no cases of infection or dehiscence scare reported. Platelet rich plasma are safe and had good effect on episiotomy wound healing.

Keywords: Platelet-Rich Plasma in Episiotomy, Episiotomy with Platelet-Rich Plasma

INTRODUCTION

During the second stage of labor, an episiotomy is done with a pudendal block [1] to widen the entrance of the vagina, which improves mother and newborn outcomes. [2,3] It is one of the

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most popular medical operations performed on women in Iraq, with a reported 73.9% success rate. [3] Despite its drawbacks, mediolateral episiotomy is extensively utilized in Arab nations, according to reports. [4] Perineal pain is the most common complaint of episiotomy, [5] which is difficult and stressful for primiparous women and has several negative consequences such as a negative effect on the first experience of motherhood, mothers' inability to care for the infant, [6] delay in mother-infant communication, fatigue, insomnia, confusion, anxiety, and ignoring health educations in relation to maternal-infant care [7]. Improving the wound healing process and minimizing discomfort may enhance women's quality of life. Wound healing is a complicated process that necessitates effective and risk-free therapy. As a result, it is critical to help women recover faster after childbirth by reducing perineal pain and discomfort and improving the healing process.[8] Both pharmacological and non-drug techniques are utilized to alleviate perineal discomfort. [3] Non-drug alternatives include hot and cold compresses, as well as salt water or diluted Savlone in the bathroom. [9,10] In reality, due to the suffering the women had from the perineal injuries caused by her first vaginal delivery, the ladies chose her second birth to be caesarean [11]. The PRP usage for wound healing of episiotomy, is depend on the evidence that an autologous serum containing elevated platelets concentrations with growth factors reduces pain by increment vascularization, pigmentation normalization, and scar smoothing and repair of tissue which is called PRP [12]. Decreasing fear & prejudice against vaginal birth can be achieved. To the best of our knowledge this clinical trial will explain originally that PRP will treat perineal traumas caused by vaginal wall scarring. Therefore, the aim of the current research was to demonstrate the PRP beneficial effect on episiotomy perineal trauma in vaginal delivery and pain treatment, that is a chronic perineal trauma complication.

MATERIAL

This study is a clinical trial randomized type was carried out in clinical trial Department in Tikrit Teaching Hospital in a time between October 2023 until June 2024. Females will be divided randomly into either group of Platelet rich plasma (30 females) or group of control (30 females). Age ≥ 18 years, full-term pregnancy with cephalic presentation, a delivery of spontaneous type in the present pregnancy and an episiotomy of right mediolateral type sutured by thread of catgut were involved in the research. Females who had laceration of perineal, infection signs, hemorrhoids, veins varicosities or hematoma in the perineal region, were excluded. Data collected through: standard questionnaire contain the information of sociodemographic characteristics (Age, educational level, residency, and job), obstetrical History (Parity, Gravidity, abortion, history of gestational diabetes, antepartum hemorrhage, preeclampsia, any drug history during pregnancy), and medical history (diabetes mellitus, hypertension, heart and liver diseases, malignancy, and chronic respiratory diseases) . Assessment of wound healing by: visual analogue scale, Edema, Redness, Discharge, Ecchymosis, scale, Approximation, and Scar Scale of Vancouver, at basal day one, 7th , 14th, and 28th day.

RESULTS

Housewife is the dominant job among PRP 19 (63.3%), and control group 21(70%). Most of the study groups are primigravida 24(80%) for PRP and control group respectively. The

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commonest cause of episiotomy was primiparity 15(50%), 14(46.7%) among PRP and control group respectively, in a none significant relation as shown in table 4.1. The pain intensity measured by VAS show that the mean total score at basal examination (day 1) was (6.4± 1.3) among PRP group and (5.9± 1.5) among control group, in a none significant relation. The total score at 1 week was (3.5 ± 0.9) among PRP group and (4.1 ± 1.2) among control group. The total score at 2 week was (2.3±0.6) among PRP group and (3.1± 0.8) among control group. The total score at 4 week was (0.9±0.6) among PRP group and (1.7±0.8) among control group, in a statistically significant relation as shown in table two. The paired-t test results demonstrated presence of a large significant variance between after and before intervention total in score in PRP group (-5.5), $p < .001$. In the control group the paired-t test indicated that there is a significant large difference between after and before intervention total score in PRP group (-4), $p < .001$. The decrement in the pain score was larger among the group of PRP than the group of the control, as shown in first figure. The healing process measured by REEDA scale show that the mean total score at basal examination (day 1) was (8.6± 1.5) among PRP group and (8.01± 1.4) among control group. The total score at 1 week was (2.9± 1.3) among PRP group and (4.7 ±0.9) among control group, in a statistically significant relation. The total score at 2 week was (1.5±0.8) among PRP group and (2.8±0.9) among control group, in a statistically significant relation. The total score at 4 week was (0.9±0.44) among PRP group and (1.9±0.5) among control group, in a statistically significant relation as shown in third table.

Paired-t test results revealed presence of that there is a major significant variance in time after and before intervention total in REEDA score in PRP group (-7.7), $p < .001$. In the control group results of paired-t test revealed presence of major significant variance between after and before intervention total score in PRP group (-6.1), $p < .001$. The decrement in the score REEDA was larger significantly among the PRP (-7.7) group than the group of control (-6.1), as shown in figure 4.2. The scare formation process measured by VSS scale show that the mean total score at basal examination (day 1) was (2.3±0.8) among PRP group and (2.6 ± 0.7) among control group, in a statistically significant relation. The total score at 1 week was (1.3±0.43) among PRP group and (1.8±0.6) among control group, in a statistically significant relation. The total score at 2 week was (0.9±0.6) among PRP group and (1.53±0.8) among control group, in a statistically significant relation. The total score at 4 week was (0.45±0.2) among PRP group and (1.3±0.6) among control group, in a statistically significant relation as shown in table 4. Paired-t test results revealed presence of a major significant variance in time after and before intervention total in VSS score in PRP group (-1.85), $p < .001$. In the control group the paired-t test revealed presence of a major significant variance in time after and before intervention total score in group of PRP (-1.3), $p < .001$. The decrement in the VSS score was larger among the PRP group than the group of control, as shown in figure 2. The commonest side effect of PRP was erythema at site of injection 14(46.7%), followed by ecchymosis 4(13.3%) which resolve after 1 week, no cases of infection or dehiscence scare reported. Among control group erythema reported among 16(53.3%), infection 1(3.3%) and infection 1(3.3%), as shown in table 4.5.

DISCUSSION

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The commonest age group was 20-25 years, among PRP group (43.3%), in comparison to control group (46.7), followed by age group 26-30 years; (40%) ,(33.3%) respectively, with mean age of the PRP group was (23.7± 8.3), tin comparison to control group (22.4± 9.2). This goes with Mohammed AK in sulimania / Iraq 2023 [13] found that the commonest age group of women undergo episiotomy was 18-25 years (64%), with mean age (23.13± 3.47), and similar to Reda M. Hable in 2021 found the mean age group was 28.56±6.1. [14] The patients level of education in group of PRP was dominantly of primary level 9 (30%) pursued by level of secondary education 7(23.3%), in comparison to control group 10(33.3%), 7(23.3%) respectively. this goes with Woretaw, E et al [15] in 2021 found that the respondents level, around 201 (49%) were had level of primary education and 320 (78.05%). Most of the research groups are primigravida 24(80%) for PRP and control group respectively, this relation was statistically not significant. This goes with Khan NY and Naji SA [17] in Yemen 2022 found that episiotomy was more common among primigravida women (81.7%).

The commonest cause of episiotomy was primipara 15(50%), 14(46.7%) among PRP and control group respectively. This in accordance with Bączek et al[18] in 2022, who found that use of an episiotomy was more prevalent among these women. Eyene F. et al. [19] 2020 discovered that the episiotomy risk was six times larger in primiparous females than in multiparous women. May be the cause is that the perineum of first-time mothers has stronger muscles than that of women who have given birth before, which could increase the length of time it takes for the cephalic pole to release, necessitating an episiotomy. Yang J, and Bai H. reveal that the principle cause behind lager episiotomy level in poor- and middle-income countries are absence of training, national norms of local, and risk of severe injury of perineum [20] The pain intensity measured by VAS show that the after treatment score was lower among PRP group (0.9±0.6) than control group (1.7±0.8). The decrement in the pain score was significantly larger among the PRP group(-5.5), than the control group(-4). This goes with Ali HM et al 2023 [21] found that decreased scores of pain were obtained in the group of PRP in comparison to the group of control; as indicted respectively by scores of Vas (3.22±0.78 vs. 3.09±1.06, 2.18±0.49 vs. 2.45±0.66 and0.73±0.42 vs. 1.5±0.64.

The after treatment REEDA score was significantly lower among PRP group (0.9±0.44) than control group (1.9±0.5). The decrement in the REEDA score was significantly higher among the PRP(-7.7) group than the control group(-6.1). This goes with Ali HM et al 2023 [21] found that the score of REEDA was decreased significantly in the group of PRP in comparison to the group of control at first, second and fourth weeks (1.5±0.49 vs. 1.85±0.7, 1.19±0.46 Vs. 1.65±0.5 and 1.65±0.5 vs. 1.65±0.5).

This may be related to what found by Liao X, et al [22] in 2020 that an increase in angiogenesis, seen by a higher micro-vessel density, was found at week one after treatment with Fat/PRP, and at week four after treatment with Fat only, compared to control. New micro-vessels were noted to be clustered around viable adipocytes. No difference was noted in epithelial thickness and cell proliferation between the groups. Sukgen G et al [23] in 2023 found that PRP treatment stimulates neovascularization and formation of collagen with the assistance of the factors of growth that are released from the platelets granules of Alfa. Elkhouly NI et al [24] found that the group of PRP revealed presence of major decrement in the score of REEDA in comparison with the group of control on day first, seventh day 7, and this was persistent up to 6 months (1.51 ± 0.90 vs. 2.49 ± 1.12).

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The after treatment VASS score was significantly lower among PRP group (0.45±0.2) than control group (1.3±0.6).The decrement in the VASS score was larger significantly among the PRP (-1.85) group than the control group (-1.3).

This goes with Ali HM et al 2023 [61] found that the score of VSS in favor of PRP (1.13±0.57 versus. 1.62±0.75, 1.1±0.52 vs. 1.48±0.65 and 0.5±0.34 versus. 1.1±0.58, in respective. Kabakcı AG and Bozkır MG [25] reported a case of 2nd degree perineal trauma treated with PRP Repeated assessments showed noticeable reduction in pain and improvements in scar healing. Tehranian A et al in a research of the effect of PRP in caesarian section [26]. PRP treated Patients had a decrement of -1.17, or a reduction of 50%, in the score VAS after eighth weeks of the research, the revealed reduction was, a 51% reduction. A identical style was revealed in the group of control: after eight weeks, there was a -1.6 decrease, or a 48% decrement.

Current study reported the commonest side effect of PRP was erythema at site of injection 14(46.7%), followed by ecchymosis 4(13.3%) which resolve after 1 week, no cases of infection or dehiscence scare reported. Among control group erythema reported among 16(53.3%), infection 1(3.3%) and infection 1(3.3%). Abuaf OK [27] , and Gawdat HI [28] found that there were no reports of infection, scarring or post-infammatory hyperpigmentation. While El-Domyati M et al [29], and Fedyakova E et al [30], reported transient post-injection pain or burning in approximately two-thirds (67%) lasting minutes to an hour. Lee Z-H, et al [31] 2019 reported erythema in PRP treated patient which is resolving within days was reported among 119 of 199 subjects. Bruising/ecchymosis at injection sites resolving within 2 weeks reported in (217 subjects) by El-Domyati M et al [29] also edema and tenderness which lasting less than 1 week were less commonly reported by Elnehrawy NYet al [32].

One of well-known episiotomy complication is wound infection, that happened because of mother's microbial flora (the skin, vagina, and gastrointestinal tract) or outer infectious agent (medical personnel infections, surgical techniques of poor quality, and delivery instruments infections and environment) [33].

the wound infections prevalence of episiotomy among control group in this research was 1.7% of patients, which is go with the documented prevalence in double researches from Pakistan (0.04%) and Nigeria (1.9%) [34,35].

Khan NY, et al [17] 2022 found that wound dehiscence was (0.7%).

In a systemic review study done by Zhang W et al [36] found that the PRP is an extract prepared by centrifugation of whole blood. Different inflammatory cytokines, and growth factors and antimicrobial proteins, will be released by activated PRP.

Bioactive molecules of PRP are the source of resolving necrotic tissue, its antimicrobial properties, and wound healing promotion.

A beneficial role for PRP has been shown for man agent of chronic infections of wound. Short-acting and is weaker than antibiotics of antibacterial strength of PRP is the main reason for

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limitations; but, synergistic effect of PRP with antibiotics, demonstrated they should be used in combination for the managent of infections o bacterial origin.

CONCLUSION

Platelet rich plasma are safe and had good effect on episiotomy wound healing. Educational programs for the health staff about the importance of the presence of Platelet rich plasma in healing of wound.

CONFLICT OF INTEREST

[No any financial interest or any conflict of interest exists.]

ACKNOWLEDGEMENTS

Also I wish to express my deep gratitude and sincere thanks to dean of college of medicine, and I would like to present my great gratitude to my all teaching staff members of the Obstetrics and Gynecology Committee, for their effort during my training period. I am particularly grateful to the health care workers, and patients who participated in this study for their willingness to assist by giving me their time and information.

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TABLES

Table 1: The general characteristics of the patients

Characteristics	PRP		Control	
	NO	%	NO	%
Age				
20-25	**13**	**43.3**	**14**	**46.7**
26-30	**12**	**40.0**	**10**	**33.3**
>30	**5**	**16.7**	**6**	**20.0**
Education				
Read and write	**7**	**23.3**	**6**	**20.0**
Primary	**9**	**30.0**	**10**	**33.3**
Intermediate	**4**	**13.3**	**3**	**10.0**
Secondary	**7**	**23.3**	**7**	**23.3**
College	**3**	**10.0**	**4**	**13.3**
Job				
Housewife	**19**	**63.3**	**21**	**70.0**
Employer	**11**	**36.7**	**9**	**30.0**
gravidity				
Primigravida	**24**	**80.0**	**26**	**86.7**

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ISSN (E): 2942-1918 Open Access| Peer Reviewed

>1 gravidity	**6**	**20.0**	**4**	**13.3**
episiotomy cause				
Prim parity	**15**	**50.0**	**14**	**46.7**
Large baby	**9**	**30.0**	**11**	**36.7**
Prolonged 2nd stage	**6**	**20.0**	**5**	**16.7**
Total	**30**	**100**	**30**	**100**

Table 2. Mean total VAS scores in the study groups at different times of follow-up.

Time of Assessment	PRP	Control	P value
	Mean ± SD	Mean ± SD	
Day 1	6.4± 1.3	5.9± 1.5	0.17
1 week	3.5 ± 0.9	4.1 ± 1.2	0.03
2 week	2.3±0.6	3.1± 0.8	0.001
4 week	0.9±0.6	1.7±0.8	0.001

Table 3. The mean total REEDA in the study groups at different times of follow-up.

Time of Assessment	PRP	Control	P value
	Mean ± SD	Mean ± SD	
Day 1	8.6± 1.5	8.01± 1.4	0.27
1 week	2.9± 1.3	4.7 ±0.9	0.001
2 week	1.5±0.8	2.8±0.9	0.001
4 week	0.9±0.44	1.9±0.5	0.001

Table 4. The mean total VSS, scores in the study groups at different times of follow-up.

Time of Assessment	PRP	Control	P value
	Mean ± SD	**Mean ± SD**	
Day 1	**2.3±0.8**	**2.6 ± 0.7**	**0.12**
1 week	**1.3±0.43**	**1.8±0.6**	**0.005**

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2 week	**0.9±0.6**	**1.53±0.8**	**0.006**
4 week	**0.45±0.2**	**1.3±0.6**	**0.001**

Table 5. The side effects of PRP

Side effect	**PRP**		**Control**	
	NO	%	NO	%
Ecchymosis	4	13.3	0	0.0
erythema	14	46.7	16	53.3
wound dehiscence	0	0.0	1	3.3
infection	0	0.0	1	3.3

FIGURES

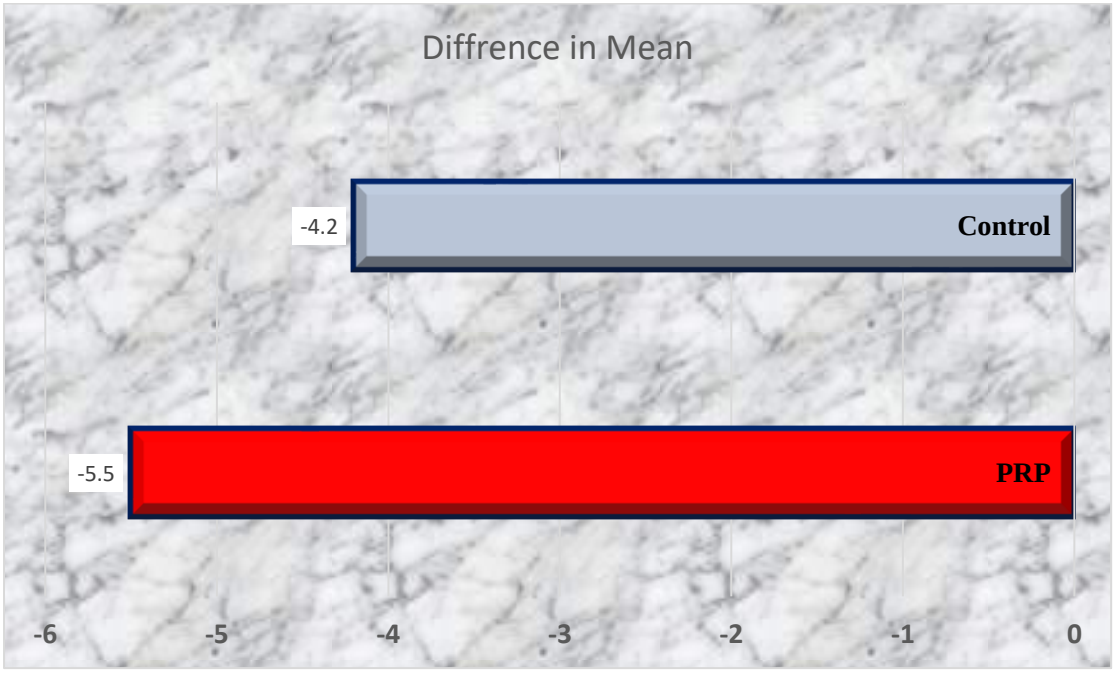

Figure 1: Mean difference from base line assessment of VAS in study groups.

Western European Journal of Medicine and Medical Science
Volume 2, Issue 8, August, 2024
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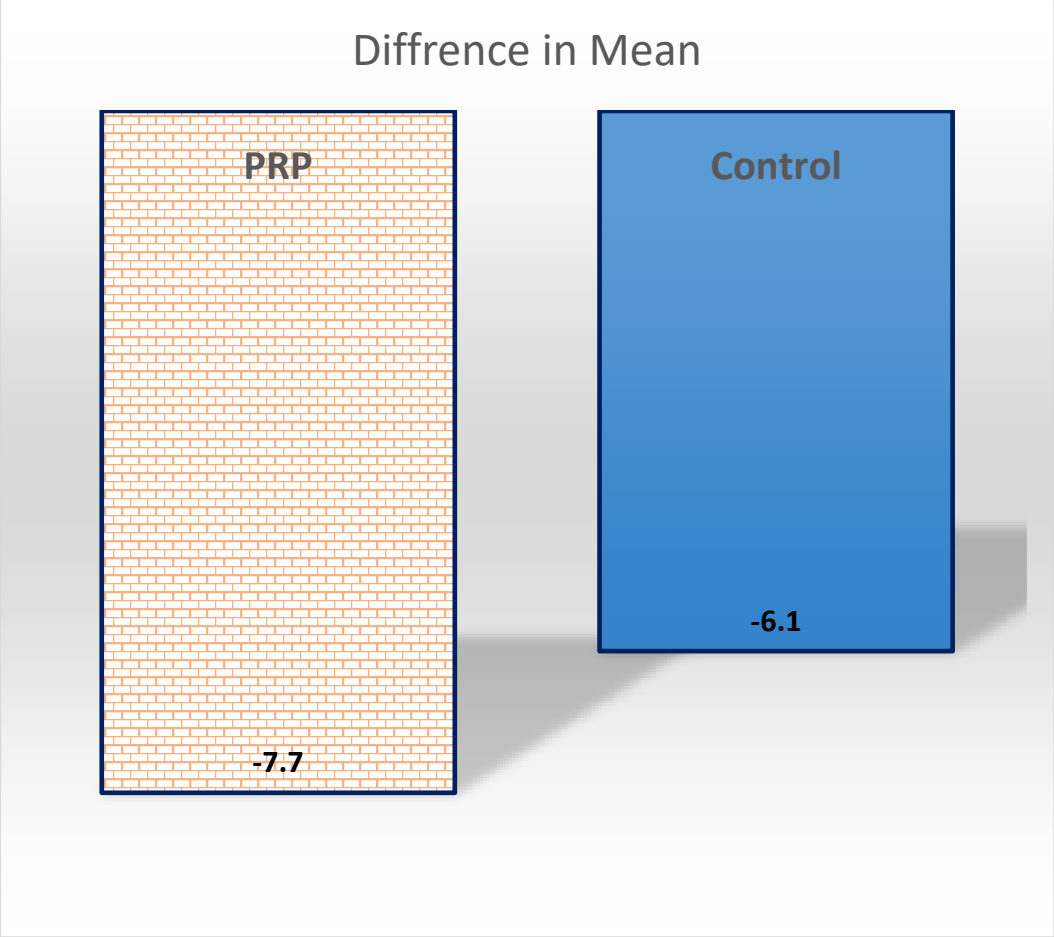

Figure 2. Mean difference the base line assessment of REEDA scale in study groups.

Western European Journal of Medicine and Medical Science
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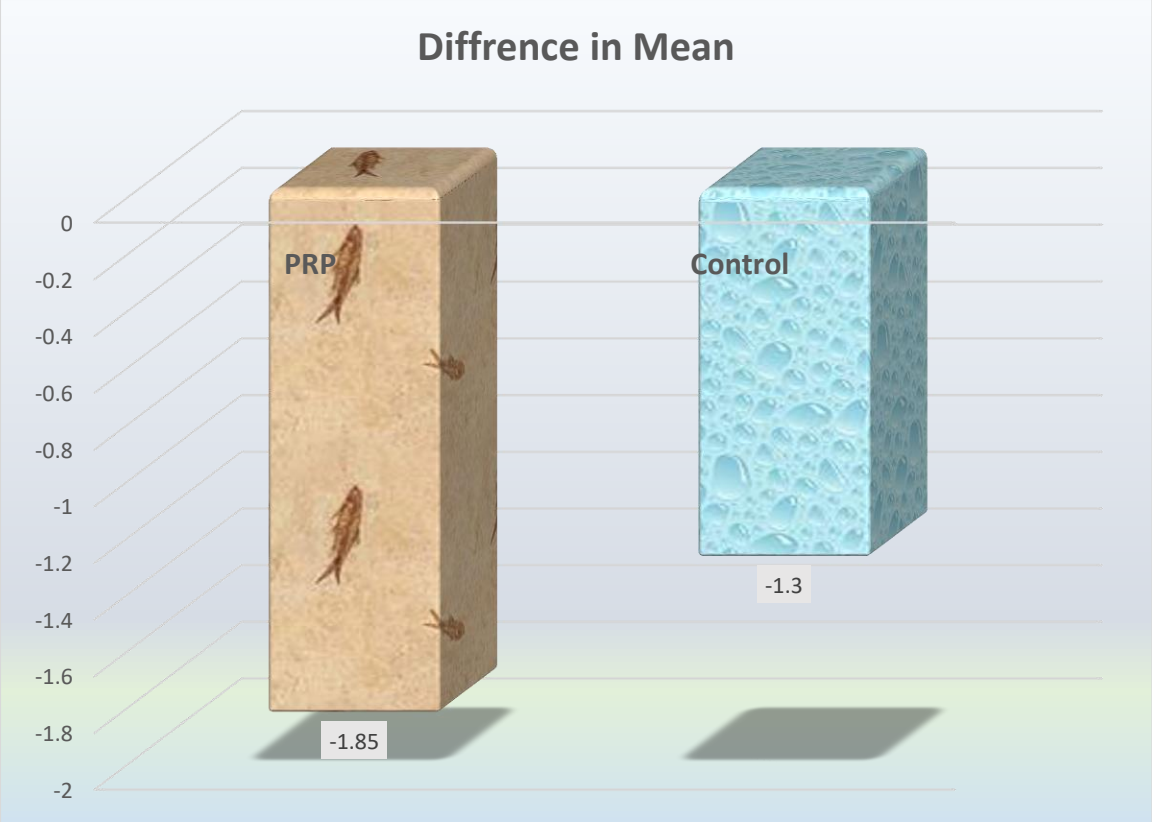

Figure 3. Mean difference from the base line assessment of VSS scale in study groups.