

Platelet-rich Plasma Gel in Wound Closure in Recurrent Cesarean Section Randomized Controlled Trial

Thesis

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لَسْبَدَّانِكَ لَا نَعْلَمُ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

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List of Abbreviations

<i>Abbr.</i>	<i>Full-term</i>
BMP	: Morphogenetic protein
CDMR	: Cesarean delivery on maternal request
CS	: Caesarean Section
DNA	: Deoxyribonucleic acid,
DVT	: Deep Venous Thrombosis
ECM	: Extracellular matrix
EGF	: Epidermal growth factor
FGF	: Fibroblast growth factor
GI	: Gastrointestinal
IL	: Interleukin
LSCS	: Lower segment caesarean section
NIH	: National Institutes of Health
PDAF	: Platelet-derived angiogenesis factor
PDEGF	: Platelet-derived endothelial growth factor
PE	: Pulmonary Embolus
PRP	: Platelet-rich plasma
RBCs	: Red blood cells
SD	: Standard deviation
SPSS	: Statistical package for social science
TGF	: Transforming growth factors

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Abstract

Background: Platelet rich plasma (PRP) is a blood derivative that contains a high value of platelet concentration which acts as a delivery system of many growth factors. Through these release reactions of many growth factors, PRP is believed to have a crucial role in the healing system. **Aim of the Work:** Comparing the use of PRP and the non use of PRP immediately in elective recurrent cesarean section at the time of skin wound closure in women with previous cesarean section as regard: post operative pain, wound healing, wound infection, cosmetic results, patient satisfaction and to assess the cost effectiveness of this intervention for the possibility of standardizing it. **Patients and Methods:** Full history: was taken including. Personal, menstrual, obstetric, present, past and family history. Physical examination: was done including general, abdominal and local examination. Investigation: was done; including, complete blood count (HB), sugar in urine and albumin in urine, ALT, AST, creatinine, BUN, PT, PTT, INR. **Conclusion and Recommendations:** More studies for evaluation of the PRP use as an aid in management of acute wounds with larger number of patients are needed to validate our initial results with more statistical strength levels.

Key words: Platelet rich plasma, blood derivative, platelet concentration

Introduction

Platelet-rich plasma (PRP) is defined as a portion of the plasma fraction of autologous blood having a platelet concentration above baseline ^(1,2). PRP have been used to treat wounds since 1985⁽³⁾

PRP serves as a growth factor agonist ⁽⁴⁾ and has both mitogenic and chemotactic properties ^(2, 5-7). It contains a high level of platelets and a full complement of clotting and growth factors ⁽¹⁾.

The mechanism of action of PRP in wound healing ⁽⁸⁾, that platelet initiate releasing locally acting growth factors ^(7,9,10) such as: Platelet factor 4(PF4) ⁽¹⁰⁻¹²⁾, interleukin-1(IL-1), platelet-derived angiogenesis factor (PDAF) ^(6,10-12), vascular endothelial growth factor (VEGF) ^(2,13,14), epidermal growth factor (EGF) (6, 11-13, 15, 16) platelet-derived endothelial growth factor (PDEGF) ⁽⁶⁾

These growth factors aid healing by attracting undifferentiated cells in the newly formed matrix and triggering cell division ⁽¹⁷⁾.

PRP may suppress cytokine release and limit inflammation, interacting with macrophages to improve tissue healing and regeneration ⁽¹⁸⁾, PRP also play a role in host

defense mechanism at the wound site by producing signaling proteins that attract macrophages ⁽¹⁹⁾.

Previous studies of PRP have demonstrated antimicrobial activity ^(20, 21).

PRP is easy to produce with minimal effort ^(17,22) and can be prepared as needed at the point of care ⁽¹⁸⁾. In a two-step process, whole blood from the patient is first centrifuged to separate the plasma from packed red blood cells and then further centrifuged to separate PRP from platelet-poor plasma ⁽²³⁾. This concentrate is then activated with the addition of thrombin or calcium ^(18,24), resulting in a gelatinous platelet gel ⁽²⁴⁾. Clinically valuable PRP contains at least one million platelets per microliter ^(2,18).

PRP used in the treatment of chronic skin and soft tissue ulcerations ⁽²⁵⁻²⁷⁾ periodontal and oral surgery ^(11,13, 19,22,25), maxillofacial surgery ^(11, 19,25,26), orthopedic and trauma surgery ^(13,18,28,29), cosmetic and plastic surgery ^(17,29), spinal surgery ^(25,26), heart bypass surgery ⁽²⁵⁾, burns ⁽¹²⁾, and pain management.

There is limited application of the use of PRP in gynecology and obstetrics, therefore in our study we try to evaluate the cost effectiveness and the benefits of PRP injection at the site of the skin wound in cesarean section and if it can be used routinely as a standard in the future.

Aim of the work

Comparing the use of PRP and the non use of PRP immediately in elective recurrent cesarean section at the time of skin wound closure in women with previous cesarean section as regard: post operative pain, wound healing, wound infection, cosmetic results, patient satisfaction and to assess the cost effectiveness of this intervention for the possibility of standardizing it.