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Minimizing Medical Error-Related Adverse Events With Platelet-Rich Plasma: A Protocolized Approach to Safety

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ABSTRACT

Platelet-rich concentrates (PRCs), derived from a patient's blood, are being used in various fields of medicine, including dermatology, for an increasing number of indications. Although considered a generally safe procedure for dermatologic indications, there have been reports in the last several years linking this treatment to cases of blood-borne infections including HIV and hepatitis.[1] Patient safety should always be the primary focus for physicians and other health care professionals, and systems-based protocols should exist within care settings to minimize errors. Herein, we review our protocol to decrease the risk of complications related to transmission of blood-borne infections and other medical errors related to PRCs.

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INTRODUCTION

Platelet-rich concentrates (PRCs), including both platelet-rich plasma (PRP) and platelet-rich fibrin (PRF), have been increasing in popularity, with uses extending to various fields including orthopedics, dentistry, aesthetics, and dermatology. These concentrates are an autologous serum and contain platelets, growth factors, and fibrin. PRP specifically has evolved as a treatment modality with numerous uses in the field of dermatology, including alopecia, skin rejuvenation, scarring, pigmentary disorders, and wound healing, among others. Combined use has been reported for synergistic benefits along with various techniques, including lasers, microneedling, dermal fillers, and autologous fat grafting.[2]

BACKGROUND

Given the autologous nature of PRCs, the safety profile of PRCs is excellent, which likely contributes to their increasing popularity, especially in dermatology. The majority of adverse events are localized, including injection-site pain, bruising, and edema, with other complications being uncommon or rare.[3] However, a review of the PubMed database (including search terms "platelet-rich concentrates," "platelet-rich plasma," "platelet-rich fibrin," "HIV," "Hepatitis B" and Hepatitis C") revealed no reported cases of HIV, hepatitis B or hepatitis C in association with PRCs at the time of query (August 31st, 2023). Nevertheless, news outlets have reported cases of these blood-borne viruses related to the administration of PRP in the United States,[1] resulting potentially from medical errors or negligence/lack of safety protocols (or both).

Patient safety and minimization of medical errors are at the center of clinical medicine. Medical errors tend to occur from the convergence of different contributory factors. Although human factors are often implicated, blaming individuals does not address nor prevent the errors from being repeated. Instead, there is a trend towards a systems-based approach, whereby care facilities recognize the potential for errors and focus on designing systems where errors are less likely to occur, along with a just culture, where workers are motivated to engage in the prevention of errors.[4]

Safety Approach for PRP

Below, we describe the various steps taken at our center to minimize errors during the administration of PRCs (PRP specifically), keeping a systems-based approach to patient safety in mind. Specifically, we review the protocol we use to minimize medical error-related adverse events. Two checklists, described below (Checklist Part I and Checklist Part II), are used as part of our protocol. Evidence supports the use of checklists for improving patient safety in healthcare settings, while reducing the incidence of adverse events, leading to improved communication between staff members and importantly, minimizing human error.[5]

Prior to administration of PRP, the following are reviewed with the patient by the treating physician: the clinical indication, the evidence for PRP treatment as well as reasonable alternatives. Contraindications are reviewed on intake form (Checklist Part I) and all questions are reviewed once again by the physician.

CHECKLIST PART 1. Patient Self-Reported Questionnaire of Contraindications for PRP

1. Have you been diagnosed or advised by a healthcare provider that you have any of the following?

	Y	N
Low platelet count (thrombocytopenia)		
Low fibrinogen (hypofibrinogenemia)		
Other problems with clotting (coagulation)		
Chronic infections (including HIV, Hepatitis B or Hepatitis C)		
Chronic liver disease		

2. Are you currently taking any medications that lead to anticoagulation (in other words, thin the blood)? Circle the answer below.

	Y	N

CHECKLIST PART II. Procedure Safety Checks

	SETTING UP
	Ensure the centrifuge is empty (no other tube is present)
	Unwrap a PRP tube for the patient (this step should be done in patient's room)
	Label PRP tube with patient's name using a permanent marker in front of patient
	Ensure that a portable sharps container is present next to the patient

	PROCEDURAL STEPS
	Prior to blood draw, show the patient the label with their name on it
	Place the labeled tube in the centrifuge and spin
	Upon completion of spinning, show patient label prior to drawing and administering PRP

Written informed consent from the patient is obtained after discussing the potential adverse events and is documented in the patient's chart.

Additional safety precautions are then taken on the day of the procedure. Firstly, sessions with PRP are only done in rooms where there is a centrifuge (an alternative would be a mobile cart). As such, the only tube placed in the machine belongs to the patient. The patient's tube (labeled in front of the patient by permanent marker) and blood do not leave the treatment room, and no tubes from other patients come in from outside the room. Additionally, we ensure a portable sharps container is placed on the equipment tray so the injector does not need to traverse the room to dispose of each syringe. Finally, there are name checks at three points in time, where the patient is shown their label: right before the blood draw, once the tube has completed spinning, and once again prior to administration. A checklist (Checklist Part II) reflecting this process is completed by our staff and documented within the patient's chart.

CONCLUSION

The popularity of PRCs in dermatology and other specialties is increasing. Therefore, physicians and other healthcare professionals need to be equipped to prevent complications, as safety is paramount for these procedures. Given the busy nature of practices, individual errors may occur. Robust safety protocols in clinics minimize such errors and prevent patient harm.

DISCLOSURES

The authors have no conflicts of interest to disclose.

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