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Commentary

Platelet-Rich Fibrin: Unresolved Questions Relating to Efficacy and Optimal Production Protocol

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ABOUT THE STUDY

Platelet-Rich Fibrin (PRF) is a second-generation platelet concentrate and biomaterial with multiple applications in clinical dentistry [1]. Recent developments in the production of PRF have resulted in several divergent protocols that could be seen to affect the reproducibility and generalizability of the available literature. Additionally, imprecise reporting on PRF production is a further confounding factor with respect to previous trial data. A systematic literature review was conducted between July 2018 and July 2021, following the advancement of basic reporting standards for the production of PRF in scientific publications [2]. The aim of the narrative review was to assess what, if any, clinical benefit could be ascribed to the use of PRF in clinical dentistry, and the quality of the evidence with a specific view to the PRF production process as reported by the authors. A PubMed and Cochrane search was conducted. Human clinical and randomized trials were included. Following the application of exclusion criteria, 50 articles were included within the meta-analysis.

Only 16% of these studies met the published standards for reporting their respective PRF protocols, undermining the certainty of the evidence.

This is especially relevant where comparisons between different formulations of PRF, such as Leucocyte-rich PRF (L-PRF) and Advanced PRF (A-PRF), were made. One split-mouth study found no significant difference between these two formulations after impacted third molar removal [3], although such comparisons would likely have been more useful in the field of socket preservation. Similarly, there was some evidence that the use of PRF in conjunction with other biomaterials, such as human allograft, produced a positive effect on socket preservation that was greater than that of its individual constituents, but the evidence was undermined by small sample sizes and multiple uncorrected comparisons [4]. In other disciplines, such as orthodontics, the use of PRF was unlikely to become incorporated into routine practice based on the limited or indemonstrable benefits from the included studies. The utility of the autologous blood product was also influenced by the availability of a comparably effective modality, such as a simple induced blood-clot in the regenerative endodontic procedure, where venepuncture in a paediatric patient appears unnecessary in the absence of definitive benefit. Conversely, where the alternative is less pleasant, such as a connective tissue graft for mucogingival surgery, and PRF can provide a comparable result, the technique may be favoured by patients and clinicians a like [5]. Again, small, split-mouth studies enable the inference of tentative conclusions.

Clinical academics are frequently undermining the quality of their own research, which is often otherwise carefully designed, through imprecise reporting of their PRF production protocol, rendering reproduction impossible and therefore sowing confusion within the literature. This narrative review avoided meta-analysis as such reviews already exist and many studies have been recycled over the course of several meta-analyses [6]. The basic scientific ideals of reproducibility and robust testing of hypotheses (such as the assertion that one PRF protocol is superior to another) have been difficult to maintain in respect of research relating to the use of PRF in clinical dentistry, due to various influences, ranging from the proprietary nature of the PRF armamentarium, to inaccurate reporting and citation of various centrifugal speeds and relative centrifugal force values for a given publication. Future research would be best served by the controlled comparison of PRF formulations in different clinical scenarios, with the PRF protocol clearly described to include the centrifugation device and tubes used, the relative centrifugal force expressed at the maximum or minimum value as a function of the distance to the rotor arm, and the spin speed and time [7]. This will, over time, improve the quality of the evidence-base relating to PRF in clinical dentistry.

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