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Platelet Concentrates as Local Antibiotic Delivery System: Systematic Scoping Review

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Objectives In the field of modern medicine, the search for effective strategies to combat bacterial infections while minimizing systemic side effects, antimicrobial resistance and limited tissue penetration remains a critical effort. Consequently, there has been a growing interest in developing innovative approaches to deliver local antibiotics. Autologous platelet concentrates (APCs) offer promise in delivering antibiotics directly to infection sites. Despite interest, a comprehensive evaluation of APCs' effectiveness in antibiotic delivery is lacking. Therefore, this systematic scoping review aims to fill this gap to provide a global understanding of the efficacy of APCs in delivering antibiotic therapy

Methods The protocol was adopted from the guidelines of the Joanna Briggs Institute on systematic scoping reviews. Three electronic databases (PubMed, Scopus, Web of Science) have been explored. Two authors separately carried out the electronic literature search and data extraction. Articles addressing the use of APCs as local antibiotic delivery system were included. The results of the selected studies were classified under the following subheadings: antibiotic loading capacity of APC, release kinetics of antibiotic and antibacterial effects of loaded APCs

Results 14 articles including 10 in vitro studies, 1 in vitro and clinical study, 1 in vitro and animal study, 1 ex-vivo study, 1 clinical study were selected. The antibiotic loading capacity and release was confirmed in all studies using doxycycline, gentamicin, linezolid, vancomycin, metronidazole and penicillin. In addition, the antibacterial effect was obtained against *E. coli*, *P. aeruginosa*, *S. mitis*, *H. influenzae*, *S. pneumoniae*, *S. aureus*

Conclusions The incorporation of antibiotics into APCs facilitated the effective release of antimicrobial agents at optimal concentrations, potentially reducing the incidence of post-operative infections, substituting or augmenting systemic antibiotic treatment while retaining APCs inherent healing properties. Additional research is needed to validate APCs loaded with antibiotics as a viable topical antibiotic delivery method in dentistry