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TITLE

LOCAL ANTIBIOTIC DELIVERY SYSTEMS FOR THE TREATMENT OF *OSTEOMYELITIS*. THE USE OF FIBRIN CLOT AS A CARRIER. AN *IN VITRO* AND *IN VIVO* PHARMACOKINETIC STUDY

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Osteomyelitis, an inflammatory process accompanied by bone destruction, is caused by infective microorganisms. Systemic administration of antibiotics in chronic osteomyelitis is characterized by questionable antibiotic penetration into the infected areas, mandatory hospitalization for prolonged administration of antibiotics and systemic side effects especially because antibiotic therapies are usually long lasting. Aware of these problems, ortopaedic surgeons have been looking for an effective alternative method of local antibiotic administration. Local and sustained availability of drugs have proven to be more effective in achieving therapeutic outcomes.

Carriers used for the local delivery of antibacterial agents may be classified as nonbiodegradable (bone cement beads) or biodegradable (fibrin-clot, bone-substitutes, polylactade polymers).The disadvantages of bone cement beads include reduce biocompatibility with bone, short duration of drug release and the need for surgical removal at the completion of antibiotic release. The biodegradable carriers do not require surgical removals. Among the biodegradable implants which are still in experimental stages, we studied in vitro and in vivo the fibrin clot-antibiotic complex as a new drug delivery system.

In vitro the maximum levels of antibiotic after the incorporation into fibrin clot were obtained on the first day, progresses rapidly at first decreasing gradually over a period of 60 days. In vivo, in all tissues around the implant, the concentration of antibiotic exceeded the MIC against the common causative organisms of osteomyelitis, for at least 10 days.

Although it is necessary to perform similar experiments using bone in pathological states, these experimental results imply the clinical applicability of this DDS.