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Povidone-iodine liposomes--an overview.

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Abstract

In recent years, liposomes have been increasingly explored as novel drug delivery systems, and several liposome-based drug products have been approved in Europe, the USA and Japan. Depending on size, composition and surface characteristics, liposomes interact specifically with biological structures. Liposomal drug products provide a topical activity at the desired locus of action and are deemed more effective and less toxic than conventional drug formulations. The combination of povidone-iodine (PVP-I) and liposomes unites the exceptional microbicidal activity of the antiseptic substance with the excellent tolerability and lack of immunogenicity of liposomes; in addition, liposomes provide a moist molecular film for the wound environment. The multilamellar vesicles act as microreservoirs hence prolonging the release of the active ingredient. Although no commercial product for repeated application on the eye is currently available, PVP-I has been used in ophthalmology not only for pre- and postoperative antisepsis, but also for the treatment of bacterial and viral conjunctivitis and for prophylaxis against ophthalmia neonatorum. For these indications, liposomal formulations with 2.5 and 5.0% PVP-I were developed. These eye drops are isotonic with tear fluid at pH 6. First in vitro tests demonstrated an excellent antimicrobial efficacy, and a placebo-controlled clinical study on volunteers showed a very good local tolerability. A study on rabbits demonstrated positive results of the PVP-I liposome eye drops compared to placebo and the broadspectrum antibiotic Polyspectran in a standardized model of Staphylococcus aureus deep eye infection. The other aim is a well-tolerated liposomal PVP-I hydrogel for improved antiseptic wound treatment with moisturizer. It has been reported that liposomes are enriched at the wound bottom for direct action against infection and support of wound healing. An animal study on the efficacy and tolerability of different formulations of a hydrogel with PVP-I liposomes in deep dermal burn wounds has indicated an outstanding quality of wound healing with smooth granulation tissue, less inflammation, less wound contraction and no hyperkeratotic reactivity, especially with the 3% PVP-I liposome formulation.

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