

Development of Biomaterial Used in Urinary Catheter to Prevent Microbial Adhesion: Effect of Drug Type

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Abstract

Introduction: Catheter associated urinary tract infections (CAUTIs) are the most common type of nosocomial infections. Leading to costly replacement of catheter and there is an urgent demand to develop novel biomaterials.

Aims: To study the effect of drug type (ciprofloxacin, levofloxacin, ampicillin and combinations of levofloxacin and ampicillin) on physicochemical and microbial resistance properties in a pH responsive (2-hydroxyethylmethacrylate) P(HEMA) hydrogel coating for urological devices.

Methods: Synthesized of hydrogels, determined the glass transition temperature (T_g), mechanical property of the films, zone of inhibition, toxicity by MTT test, Swelling ratio (SR) and drug release.

Results: Tensile strength and Young's modulus was the highest upon loading P(HEMA).

Zone of inhibition was the highest when loading the P(HEMA) with levofloxacin or combination of levofloxacin and ampicillin. SR increased at pH 9, the formulations were safe.

Conclusion: P(HEMA) hydrogel was successfully loaded with different antimicrobial agents to decrease bacterial adhesion.