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





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







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



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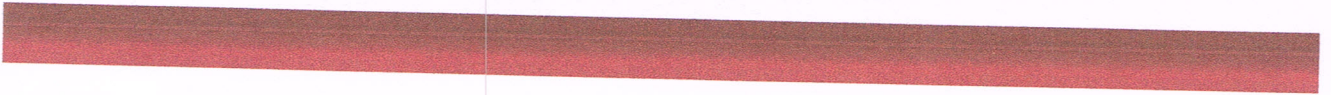
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Research Article



The Efficacy of Multipurpose Contact Lens Solutions were Sold in Indonesia against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Candida albicans* and *Aspergillus niger*

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ABSTRACT

Contact Lens is a lens placed on the cornea of the eye to improve vision. Multipurpose contact lens solution/MPS (Multipurpose solution) is a disinfectant solution of contact lenses that causes of microbial keratitis. This study aims to evaluate the efficacy of antimicrobial MPS were sold in Indonesia against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Candida albicans* and *Aspergillus niger* and determine the contact time in order to achieve maximum antimicrobial effect by the Stand Alone criteria method with variation of contact time 1 hour, 3 hours, 6 hours, and 24 hours, based on International Organization for Standardization (ISO) 14729 guidelines. The results showed that this study indicated all of the MPS have activity as antimicrobial after exposure for 24 hours. MPS B which contained Polyhexamethylene biguanid showed the greatest decrease in the concentration of the challenge organisms with contact time was 6 hours.

Keywords: multipurpose solution, Antimicrobial *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *aspergillus niger* and *candida albicans*

INTRODUCTION

Contact lens is visual aids other than glasses that is placed on the cornea of the eye to improve vision, primarily for cosmetic purpose (Eleonore, 2013). In worldwide including Indonesia, more than 125 million of people use contact lens as an alternative eyesight (Yvonne, 2010; Rumpakis, 2010). The incidence of contact lens associated complications is rare, but if severe, could lead to permanent vision loss. Microbial keratitis is the most serious and sight threatening condition associated with contact lens wear (Yvonne, 2010).

Microbial keratitis is potentially devastating complication of contact lens wears. A large segment of current contact lens research is directed towards the treatment and prevention of conditions resulting from contact lens contamination and colonization by foreign organisms. Breaks in the corneal epithelium were probably important predisposing factors to bacterial keratitis (Eleonore, 2013).

Investigations have documented that contact lens-related microbial keratitis is commonly caused by bacteria such as *Staphylococcus aureus* and *Pseudomonas aeruginosa* (Mohammadinia, 2012) and also caused by fungi such as *Candida albicans* and *Aspergillus niger* (Liesegang, 1980).

Multipurpose contact lens solutions (MPS) are used for cleaning and disinfecting contact lenses. They are designed to adequately clean and disinfect lenses with a simple rinse-and-store method, eliminating the need to mechanically rub the lenses to remove lens deposits. Despite antibacterial properties have been demonstrated, but duration of contact time between the contact lens and

MPS solution has not been determined, so it is necessary to determine the contact time between the MPS with contact lenses (Liesegang, 1980).

This study determined the efficacy of Multipurpose Contact Lens Solutions against *Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Candida albicans* and *Aspergillus niger* and determined the effective contact time of that solution (Jalbert, 2010).

MATERIALS AND METHODS

Five bottles of multipurpose contact lens solutions (MPS), commonly marketed in Indonesia and manufactured by different companies were evaluated.

These test solutions were categorized based on their identified disinfecting ingredient.

The investigator performing the microbiological procedures was blinded with regards to the brand of multipurpose solution during the duration of the study (Eleonore, 2013). The MPS tested are listed in Table 1.

Table 1: Characteristics of the multipurpose contact lens solutions (MPS) tested.

Multipurpose Solution (MPS)	Active substances
A	Polyaminopropyl biguanid 0.0001 %
B	Polyhexamethylene biguanid
C	Polyhexanide
D	Polyhexamethylene biguanid
E	Polyaminopropyl biguanid 0.0001 %

