ATTACHMENT OF A CLINICAL STRAIN OF *Staphylococcus epidermidis* TO WORN AND UNWORN SILICONE HYDROGEL CONTACT LENSES

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ABSTRACT

Silicone hydrogel contact lenses (CL) are the newest kind of disposable lens commercially available. The copolymerization of silicone elastomers with hydrogels improves the oxygen transmissibility of silicon hydrogel CL when comparing to the conventional hydrogel CL, contributing to a better oxygen supply to the corneal tissues. However, despite this great advantage, this type of CL is usually more hydrophobic and thus is expected to be more prone to microbial colonization. The aim of this work was to study the attachment of a clinical strain of *S. epidermidis* (9142) to worn and unworn silicone-hydrogel CL through dynamic adhesion assays.
The silicone hydrogel CL used in this study were Balafilcon A (Purevision™, Baush&Lomb), Galyfilcon A (Acuvue®Advance™ with Hydraclear, Jonhson&Jonhson Vision Care), Lotrafilcon A (Focus® Night & Day™, Ciba Vision) and Lotrafilcon B (O_2Optix™, CibaVision). A conventional hydrogel Etafilcon A (Acuvue®, Jonhson&Jonhson) was also assayed. The worn CL were obtained from a group of human volunteers that used the silicone hydrogels during 1 month and the conventional hydrogel for a period of 15 days, in a daily wear schedule. The attachment assays were performed in a parallel plate flow chamber at laminar flow.
The attachment experiments revealed that unworn silicone hydrogels are more prone to bacterial colonization than worn CL. Contact angle measurements, performed with Millipore water, demonstrated that after wear silicone-hydrogel CL become less hydrophobic, which may explain the decrease in the extent of bacterial adhesion to worn CL. In addition the reduction on contact angles formed on this type of lenses may be due to the adsorption of amphiphilic molecules present in the lachrymal tear film such as proteins and lipids. The conventional hydrogel Etafilcon A showed a different behaviour compared with the silicone hydrogels, concerning both hydrophobicity and bacterial attachment. This CL becomes hydrophobic after wear and exhibit an increase in bacterial colonization. This result may be due to a greater loss of the free water content enhancing the interactions between the lens surface and the bacteria.