

TITLE: FUNGAL BIOFILMS IN HEMODIALYSIS FLUIDS: A RISK FACTOR FOR PATIENTS UNDERGOING RENAL REPLACEMENT THERAPY

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ABSTRACT: Hemodialysis is a process of blood clearance that occurs with the aid of a machine called a dialyser that acts as an artificial kidney. Inside the dialyser, the blood is exposed to dialysate, a solution composed by purified water and minerals. However, the absence of any type of antimicrobial in the water makes it susceptible to microbial contamination downstream of the water treatment, which contributes to the development of biofilms in the dialysate path way of the proportionating system of hemodialysis machines. This study aimed to evaluate the ability of biofilm formation by fungal isolates in the dialysate and its constituent solutions. Strains of *Aspergillus* (*A. niger* and *A. terreus*, n = 18), *Fusarium* (*F. oxysporum*, n = 10) and *Penicillium* (*P. bravicompectum* and *Penicillium* spp., n = 7) were recovered from the water circuit of a hemodialysis facility. The biomass of the biofilms were determined by the crystal violet method and its ultrastructures were visualized by scanning electron microscopy (SEM). *Fusarium* strains were the most homogeneous group in biofilm-forming ability on both dialysate and other solutions. *Aspergillus* showed high variability in biofilm formation. The biomass formed in the dialysate, for all strains of *Penicillium*, was greater than that formed in the concentrated acidic or basic. SEM analysis of biofilms showed dense aggregation of hyphae, presence of conidial structures and matrix. The demonstration that fungal biofilm can be formed in dialysis fluids strengthens the need for the inclusion of fungi and, in particular, biofilms, in quality of dialysis fluid since the morbidity and mortality of patients with chronic renal failure are associated with dialysis practices.

Keywords: biofilms, hemodialysis, water microbial contamination.

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