USE OF GLYCOSAMINOGLYCANS TO IMPROVE THE HEMOCOMPATIBILITY OF DIALYSIS MEMBRANES

Roberto Nese (TNW-AOT), Odyl ter Beek (TNW-AOT), Edwin Kellenbach (Biochem Oss), Dimitrios Stamatialis (TNW-AOT)

1. Introduction

Recent studies affirm that the number of patients with end stage renal disease (ESRD) is constantly increasing. This situation demands innovations in hemodialysis technology, such as more continuous dialysis therapies that can increase the mobility and life expectancy of patients[1].

2. Objectives

The development of continuous dialysis therapies requires dialysis membranes with excellent hemocompatibility. To achieve this, we aim to incorporate Glycosaminoglycans (GAGs) to dialysis membranes. GAGs are linear polysaccharides that can be found in human's kidneys and provide natural anticoagulating properties.

3. Methods

We aim to fabricate membranes from a polymer solution with blended GAGs. In this study we optimized the fabrication process of the membranes, we performed material analysis and staining to verify the presence of the incorporated GAGs, we tested the membranes' water permeance and toxin removal efficiency from human plasma, and we aim to perform biological assays to assess the improved hemocompatibility.

4. Results

In accordance with our previous study[2], we expect to observe that one specific type of GAG, Danaparoid, shows improved anticoagulating properties when compared to other types of GAGs, membranes without GAGs and other commercial membranes.

5. Conclusion

We obtained membranes with good transport properties, making them suitable for dialysis. However, further dialysis experiments with full human blood are necessary to verify the improved hemocompatibility and toxin removal compared to commercial dialysis membranes and lab-made membranes without GAGs.

6. References

1. Stamatialis, Dimitrios, WS (2017). 9813221755
2. Kim, DooLi, et al. (2024). 122669.