Indigenous Membrane Cartridges for Hemodialysis

Problem Statement: Most hemodialysis instruments, accessories, and consumables are imported in India, including the Hemodialysis Fistula Maturation (HFM) dialyser. Indigenous dialysis cartridge development is the country's unmet demand and needs for quality and affordable healthcare requirements. There are lakhs of patients suffering from kidney failure and are heavily dependent on dialysis using imported cartridges. However, only one-third of the patients can afford this treatment. Even though the technology itself is well known and doable in India, it requires coordination among various domain expertise for improvisation in terms of cost-effectiveness and performance.

Uniqueness of the Solution: The researchers have developed a novel composition of dialysis-grade membranes at low-cost prices. These indigenous membrane cartridges exhibit excellent compatibility with human blood. In addition, these have high uremic toxins removal efficiency and high permeation flux with minimal side reactions.

Current Status of Technology: While the animal trials are underway, the experiments in later stages will be on humans to reduce the risk of failure of the dialyser developed. The preliminary results suggest the performance of the developed membranes is far better than that of the commercial ones, and hopefully, these will be tested on the large animal models.

Societal Impact: India is prone to be a dialysis hub due to increasing diabetes and cardiovascular patients. From the Indian point of view, most dialyser instruments, accessories and consumables are imported – a reason why the foreign companies have a monopoly in the Indian market and generate massive revenue. However, the success of the proposed technology will lead to indigenous, low cost, high performing hemodialysis membranes. Therefore, it has a high potential to fulfil the existing unmet demand of hemodialyser at an affordable price, thus impacting a large section of society.

Patent(s): Filed and Granted

Relevant Industries: Healthcare, Medical Devices, Materials.

Faculty: Prof. Jayesh Bellare, Chemical Engineering.