ABSTRACT

Coronary Heart Disease (CHD) is a condition where the coronary arteries narrow due to plaque buildup, called atherosclerosis. This research aims to fabricate membranes vascular patch for the treatment of CHD with mechanical properties suitable for the human body. Method electrospinning to create membranes with pores that support cell growth. PLA and collagen were chosen because of their good degradation properties and low risk of immunological reactions. PVA as guest polymer used because of its nature electrospinnable so that it can form composites, materials consisting of different ingredients, combined to produce better properties than the constituent materials individually. Membrane fabrication with composition ratios of 90/10, 80/20, 70/30, and 60/40. Characterization using FTIR, degradability, and SEM, with the best recommended composition 80/20. The results of the FTIR test show the C=O group at the peak of 1,634.00 cm-1 and C-H at the peak of 2,930.19 cm-1, which indicates the presence of PLA as a characteristic of its molecular structure. Collagen, as a protein, indicated the presence of amide I and C-O groups at the peak of 1,077.62 cm-1, which is typical for protein structures. PVA, as guest polymer, there is an O-H group detected at the peak of 3,295.09 cm-1. The degradability test showed promising results with a degradation rate similar to the regeneration process of vascular cells. With a degradation rate of 0,0001 g per day, a 90/10 ratio sample will be completely degraded on the 110th day, corresponding to the vascular regeneration process in 3-6 months. The 80/20 sample degrades more slowly, making it the best sample because it lasts longer. SEM results on sample 80/20, diameter 497.50 ± 53.82 nm. Thus, membrane fabrication vascular patch can be an effective therapeutic alternative for the treatment of CHD.

Keywords: *electrospinning, coronary heart disease, collagen, membrane, polylactic acid*