

ABSTRACT

Diabetes mellitus is a metabolic disease that disrupts the balance of the blood sugar regulation system due to insulin resistance. In most cases, insulin injections are required every day for years. So that it will cause patient disobedience due to the pain caused. This study aims to make polymer microneedle as an alternative to transdermal drug protein delivery without needles so that it will not cause pain during its use. The manufacture of microneedle in this study uses two polymeric materials that are very abundant in Indonesia and have affordable prices, namely PVA as a synthetic polymer and Alginate as a natural polymer that has a high enough viscosity. The method carried out in this study is by formulating the two polymeric materials with the right ratio, namely PVA-Alginate 0.2 grams, PVA-Alginate 0.25 grams, and PVA-Alginate 0.3 grams which will then be printed catrige microneedling at room temperature to produce a good polymer microneedle. The best results obtained were polymer microneedle with 0.25 gram PVA-Alginate formulation with a needle height of 1182 μm with a base diameter of 289 μm and a needle tip diameter of 42.36 μm . As well as other needles that have a needle height of 1190 μm with a base diameter of 284 μm and a needle tip diameter of 37.36 μm . This shows that the needles formed meet the standards of a good micron needle, and the difference between one needle and another is not significant. In addition, the FTIR results also show that the use of this solution is safe because it does not cause new functional groups.

Keywords: *Alginate, Catrige Microneedling, Diabetes, Microneedle, Polyvinyl alcohol.*