ABSTRACT

Wound healing is an intricate, sequential, biological process that tends to restore the injured tissue. Chronic wound healing is a growing, clinical problem which requires effective wound management strategies. Researchers are continuously making headways in the development of novel wound dressings and formulations to accelerate the wound healing process, minimize the infection rate, and prevent the attack of microorganisms at wound bed. The aim of the present study was to prepare effective silk derived formulations in combination with plant extracts (*Aloe vera* gel) to speed up the process of wound healing in diabetic mice. Experimental diabetes was induced in albino mice by using alloxan monohydrate. After successful induction of diabetes in mice, excision wounds were created in them via biopsy puncture (6mm). Wound healing effect of silk sericin (5%) and silk fibroin (5%) individually and in combination with *Aloe vera* gel (5%) was evaluated by determining the percent wound contraction, healing time period and histology. The results indicated that the finest biocompatible silk combination was of silk fibroin (5%) and *Aloe vera* gel (5%) in which wounds were healed in 13 days (percent wound contraction ± SEM : 98.33± 0.80). However, wounds in positive control (polyfax) were healed in 19 days with 98.5±0.67 percent contraction ± SEM. Histological results also revealed that wounds treated with silk formulations have increased growth of blood vessels, collagen fibers, and much reduced inflammation. Hence, it can be concluded that silk of *Bombyx mori* is a natural biomaterial which can be utilized to fabricate wound dressings and to prepare more innovative silk based formulations for speedy recovery of chronic wounds.