ABSTRACT

Wound healing is an orderly, complex and biological process that leads to the restoration of injured tissues. The healing mechanism of acute wounds is an organized process where keratinocytes, microvascular cells, fibroblasts and immune cells play a crucial role in the repair of integrity of tissues. To heal the wounds, different moist and antimicrobial wound dressings are being introduced by different scientists and their demand is increasing day by day. The aim of the present study was to prepare the potent silk sericin based hydrogel in combination with plant extract and AgNPs to accelerate the acute wound healing process. Experimental excision wounds were created in mice by using 6mm biopsy puncture. Wound healing potential of silk sericin (2%) individually and in combination with Curcumin (2%), banana peel powder (2%) and AgNPs (2%) was estimated by calculating the percent wound contraction, histology, healing time period and biochemical tests. The results showed that the sericin and banana peel powder hydrogel has good healing effects on wound healing in which wounds were healed in 11 days (percent wound contraction ±SEM: 86.928 ± 0.424). However, wounds treated with polyfax (positive control) were healed in 13 days with 73.83±2.976 percent contraction ±SEM. Histological evaluation also shown that wounds covered with hydrogel have more healing ratio than uncovered wound and have mitogenic and cytoprotective effects on the cells. It also stimulates the production of collagen and very low immune responses are produced. Biochemical tests also revealed that Hence it can be concluded that silk sericin based hydrogel in combination with plant extract and AgNPs can be used as natural biomaterial in wound dressing for rapid healing of acute wounds.