

Seal and Heal Miracle Ointment: Effects of Cryopreserved and Lyophilized Amniotic Membrane on Experimentally Induced Diabetic Balb/C Mice

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Abstract : Healing restores continuity and form through cell replication; hence, conserving structural integrity. In response to the worldwide pressing problem of chronic wounds in the healthcare delivery system, the researcher aims to provide effective intervention to preserve the structural integrity of the person. The wound healing effects of cryopreserved and lyophilized amniotic membrane (AM) of a term fetus embedded into two (2) concentrations (1.5 % and 1.0 %) of absorption-based ointment has been evaluated in vivo using the excision wound healing model 1x1 cm size. The total protein concentration in full term fetus was determined by the Biuret and Bradford methods, which are based on UV-visible spectroscopy. The percentages of protein presence in 9.5 mg (Mass total sample) of Amniotic membrane ranges between 14.77 - 14.46 % in Bradford method, while slightly lower to 13.78 - 13.80 % concentration in Biuret method, respectively. Bradford method evidently showed higher sensitivity for proteins than Biuret test. Overall, the amniotic membrane is composed principally of proteins in which a copious amount of literature substantially proved its healing abilities. After which, an area of 1 cm by 1 cm skin tissue was excised to its full thickness from the dorsolateral aspect of the isogenic mice and was applied twice a day with the ointment formulation having two (2) concentrations for the diabetic group and non-diabetic group. The wounds of each animal were left undressed and its area was measured every other day by a standard measurement formula from day 2,4,6,8,10,12 and 14. By the 14th day, the ointment containing 1.5 % of AM in absorption-based ointment applied to non-diabetic and diabetic group showed 100 % healing. The wound areas in the animals treated with the standard antibiotic, Mupirocin Ointment (Brand X) showed a 100% healing by the 14th day but with traces of scars, indicating that AM prepared from cryopreservation and lyophilization, at that given concentration, had a better wound healing property than the standard antibiotic. Four (4) multivariate tests were used which showed a significant interaction between days and treatments, meaning that the ointments prepared in two differing concentrations and induced in different groups of the mice had a significant effect on the percent of contraction over time. Furthermore, the evaluations of its effectiveness to wound healing were all significant although in differing degrees. It is observed that the higher the concentrations of amniotic membrane, the more effective are the results.

Keywords : wounds, healing, amniotic membrane ointments, biomedical, stem cell

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