

## ABSTRAK

**Latar Belakang:** Penanganan luka kronis diabetik belum optimal dan mahal. Putih telur ayam mengandung substansi mitogen, antioksidan, inhibitor *angiotensin converting enzyme*, dan inhibitor protease yang dapat memperbaiki faktor-faktor penghambat penyembuhan luka serta harganya terjangkau, tapi belum pernah diteliti. Penelitian ini bertujuan untuk mengetahui pengaruh putih telur ayam pada penyembuhan luka kulit kronis diabetik.

**Metodologi:** Penelitian eksperimental dilakukan *in vitro* pada model fibroblas glukosa tinggi, menggunakan rancangan *post-test only control group*, untuk mengetahui pengaruh putih telur ayam pada aktivitas proliferasi dan deposisi kolagen fibroblas. Penelitian *in vivo* pada model tikus diabetik, menggunakan *multifactor random design* untuk mengetahui pengaruh putih telur ayam pada penutupan luka dan *post-test only control group* pada kepadatan kolagen dan epitelialisasi luka. Hasil penelitian diuji dengan ANOVA satu arah, yang dilanjutkan dengan studi *post hoc* LSD untuk data numerik serta Chi Square untuk data kategorik. Kruskal Wallis dan Mann Whitney digunakan bila distribusi data tidak normal atau tidak memenuhi syarat Chi Square. Nilai  $p \leq 0,05$  dianggap bermakna secara statistik. Kemaknaan klinis penelitian *in vivo* dinilai dari *effect size* atau risiko relatif.

**Hasil:** Indeks proliferasi dan indeks deposisi kolagen dari model fibroblas glukosa tinggi dalam putih telur ayam lebih tinggi secara bermakna dibandingkan kontrol pada hari ke-5 pascaperlakuan ( $p \leq 0,05$ ). Penutupan luka, kepadatan kolagen, dan kejadian epitelialisasi lengkap tidak berbeda bermakna antara luka diabetik yang diberi putih telur ayam dibandingkan vehikulum, tetapi putih telur ayam memperlihatkan makna klinis yang lebih besar dibandingkan vehikulum.

**Kesimpulan:** Putih telur ayam memiliki potensi untuk memperbaiki gangguan fungsi fibroblas dan hambatan penyembuhan luka kulit kronis diabetik.

**Kata kunci:** diabetes melitus, filtrasi, hiperglikemia, luka kronis, putih telur ayam.

## ABSTRACT

**Background:** Cutaneous diabetic chronic wound's management remains a challenge. Mitogen, antioxidant, angiotensin converting enzyme inhibitor and protease inhibitor peptides in chicken egg white are able to counter the main factors of non-healing wound, but has not been studied. The study was designed to determine the effects of chicken egg white on cutaneous diabetic chronic wound.

**Methods:** Study was conducted experimentally using high glucose-induced fibroblast model and diabetic rat model. The effect of chicken egg white on fibroblast proliferation and collagen deposition *in vitro* were studied using post-test only control group design on day 5 post-treatment. *In vivo* wound closure was studied using multifactor random design, while collagen density and epithelialisation were studied using post-test only control group. One-way ANOVA with post hoc LSD and Chi square were used to analyze the data. When assumption was violated, Kruskal Wallis and Mann Whitney were used instead. *p*-value  $\leq 0,05$  was considered significant. Cohen's *d* and relative risk were used to describe the effect sizes of the chicken egg white *in vivo*.

**Results:** Fibroblast proliferation index and collagen deposition index of the fibroblast model in chicken egg white media were significantly higher than control on day 5 post-treatment ( $p \leq 0.05$ ). There were no statistically different between diabetic wound treated with egg white and vehiculum on wound closure, collagen density, and epithelialisation, but the effect sizes of the chicken egg white were larger compared to the vehiculum.

**Conclusion:** Chicken egg white shows promise in restoring the fibroblast altered by high glucose stress and improving the diabetic wound healing process.

**Kata kunci:** chicken egg white, chronic wound, diabetes mellitus, filtration, hyperglycemia.