ABSTRAK

Pengaruh *Seeding* Sel Punca Amnion Terhadap Ekspresi PDGF, VEGF, FGF, *Occludin*, *Claudin*-4 Dan Karakterisasi Histologi Proses Penyembuhan Luka Model *Repair* Fistula Vesikovagina

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Latar Belakang : Fistula vesikovagina adalah salah satu masalah di negara berkembang. Kegagalan repair fistula dipengaruhi oleh proses penyembuhan luka, infeksi dan sistem imunologi. Pada proses penyembuhan luka, disebutkan peran *growth factors* seperti PDGF, VEGF dan FGF. Beberapa studi juga mulai mengaitkan peran *tight junction* terhadap proses penyembuhan luka, terutama *occludin* dan *claudin*. Amnion merupakan bahan yang ideal untuk rekayasa jaringan. Selain sebagai sumber sel punca, amnion juga dapat digunakan sebagai *scaffold* untuk proliferasi dan differensiasi sel punca itu sendiri.

Tujuan : Menjelaskan proses penyembuhan luka dengan pemberian *seeding* sel punca amnion pada amnion kering dalam kasus fistula vesikovagina berdasarkan ekspresi PDGF, VEGF, FGF, ocludin, *claudin*-4 dan karakterisasi histologi.

Metode : merupakan penelitian *post test only control group design.* Subjek penelitian adalah kelinci *New Zealand* betina dengan berat 3 – 4,5 kg yang dibagi menjadi 4 kelompok (K=kontrol/penjahitan primer), (P1=penjahitan ditambah *fresh-dried* amnion), (P2=penjahitan dengan *seeding* sel punca), (P3=penjahitan dengan injeksi sel punca) dengan sampel 12 tikus perkelompok. Masing-masing kelompok dibagi menjadi 2, dan dilakukan terminasi pada hari ke-4 dan hari ke-21. Pada hari ke-4, dilakukan pengukuran ekspresi PDGF, VEGF dan FGF. Sedangkan *occludin*, *claudin* dan karakterisasi histologi fibroblas, reepitelialisasi, angiogenesis, deposisi kolagen diukur hari ke 21.

Hasil : Rerata PDGF pada P2 merupakan hasil tertinggi (P2=7,70) namun uji signifikansi P2 dan P3 yakni p=0.562 yang menunjukkan hasil tidak bermakna. Rerata ekspresi VEGF dan FGF pada P2 lebih tinggi secara signifikan dibanding kelompok lain . Rerata ekspresi *occludin* dan *claudin*-4 pada P2 merupakan hasil tertinggi dengan rerata 5,40. Namun uji signifikansi dengan P2 dengan P3 menunjukkan hasil tidak bermakna yakni p=0.92 dan p=0.268. Angiogenesis lebih tinggi P2 secara bermakna, namun tidak berbeda bermakna dengan P3. Namun maturasi fibroblast, reepitelisasi dan deposisi kolagen tidak ada perbedaan antara kelompok kontrol, P1, P2 dan P3.

Kesimpulan: Penggunaan sel punca mesenkimal yaitu amnion yang di *seeding* pada *fresh-dried amnion* dapat mempengaruhi penyembuhan luka berdasarkan ekspresi pada PDGF, VEGF, FGF, *occludin*, *claudin*-4 dan karakterisasi histologi.

Kata kunci : Fistula vesikovagina, sel punca amnion, VEGF, PDGF, FGF, *claudin*-4, *Occludin*.

ABSTRACT

Effect of Amniotic Stem Cell Seeding On Expression of PDGF, VEGF, FGF, Occludin, Claudin-4 and Histology Characterization of Histology on The Vesicovaginal Fistula

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Background *: Vesicovaginal fistula is one of the problems in developing countries. Fistula repair failure is affected by the process of wound healing, infection and the immunological system. In the process of wound healing, mentioned the role of growth factors such as PDGF, VEGF and FGF. Several studies have also begun to link the role of tight junctions in the process of wound healing, especially occludin and claudin. Amnion is an ideal material for tissue engineering. Amnion can also be used as a scaffold for the proliferation and differentiation of stem cells themselves.*

Aims *: Explain the wound healing process by giving amniotic stem cell seeding to dry amnion in the case of vesicovaginal fistula based on expression of PDGF, VEGF, FGF, occludin, claudin-4 and histological characterization.*

Method *: This study is a post test only control group design study. Subjects were female New Zealand rabbits weighing 3 - 4.5 kg divided into 4 groups (K = primary control / suturing), (P1 = suturing plus fresh-dried amnion), (P2 = suturing with stem cell seeding), (P3 = suturing by injection of stem cells) with a sample of 12 group mice. Each group was divided into 2, and termination was done on the 4th day and 21st day. On the 4th day, PDGF, VEGF and FGF were measured. Whereas occludin, claudin and histological characterization of fibroblasts, re-epithelialisation, angiogenesis, collagen deposition were measured day 21.*

Result : *The mean PDGF on P2 was the highest result (P2 = 7.70) but the significance test of P2 and P3 was p = 0.562 which showed no significant results. The mean expression of VEGF and FGF on P2 was significantly higher than other groups. The average expression of occludin and claudin-4 in P2 was the highest result with a mean of 5.40. However, the significance test with P2 and P3 showed no significant results, namely p = 0.92 and p = 0.268. Angiogenesis was significantly higher P2, but not significantly higher than P3. However, fibroblast maturation, reepithelialization and collagen deposition were not different between the control groups, P1, P2 and P3.*

Conclusion: *The use of mesenchymal stem cells namely amnion which is seeded in fresh-dried amnion can affect wound healing based on expression on PDGF, VEGF, FGF, Occludin, Claudin-4 and histological characterization.*

Keyword *: Vesicovaginal fistula, amnion stem cell, VEGF, PDGF, FGF, Claudin-4, Occludin.*