

ORAL PRESENTATION

**THE EFFECT OF DIFFERENT MEDICINAL HERBS ON DIFFICULT WOUND HEALING IN EXPERIMENTAL *IN VITRO* SKIN AND BONE FORMATION MODEL**

Fulya Gülbağca<sup>1</sup>, Pınar Kılıçaslan Sönmez<sup>2</sup>, Mahmud Özkut<sup>2</sup>, Mesut Mete<sup>3</sup>, Fatma Şimşek<sup>1</sup>, Tahir Burhan<sup>4</sup>, Sevinç İnan<sup>5</sup>, Mehmet İbrahim Tuğlu<sup>2</sup>

<sup>1</sup>Department of Histology and Embryology, Faculty of Medicine, İzmir Katip Celebi University, İzmir, Turkey, [fulyagulbagca@gmail.com](mailto:fulyagulbagca@gmail.com)

<sup>2</sup>Department of Histology and Embryology, Faculty of Medicine, Manisa Celal Bayar University, Manisa, Turkey,

<sup>3</sup>Department of Neurosurgery, Faculty of Medicine, Manisa Celal Bayar University, Manisa, Turkey,

<sup>4</sup>Department of Gastroenterology, Faculty of Medicine, Manisa Celal Bayar University, Manisa, Turkey,

<sup>5</sup>Department of Histology and Embryology, Faculty of Medicine, İzmir Ekonomi University, İzmir, Turkey

**Objective / Purpose:** Skin and bone wound healing is particularly hard to heal in situations such as diabetes. Since the desired treatment can not be obtained in the classical treatments, the patients use Medical Herbs (MH) unconsciously for support purposes. MH need to be added to the treatment by proving benefits and harmful effects with the medical methods based on the evidence. In this study, the effects of wound healing in culture media on the TSB samples used by patients were examined.

**Material and Methods:** Pomegranate (*Punica granatum*, PG), *Ganoderma lucidum* (Lingzhi-Reishi mushroom, GL) and Inula viscosa (*Arum italicum*, IV) were selected as examples of MH. L-929, osteoblast cells derived by differentiation of Mesenchymal Stem Cell (MSC) and MSCs were proliferated in culture medium to be confluent. Semiconfluent cells, a wound pattern was created by a scratch with a pipette tip. A high-glucose medium was used to simulate a difficult wound condition. The effect of TSB was calculated by depending on the wound closure process. Characterization of the cells was determined by Stro-1 (+), CD90 (+) and CD45 (-) for MSC. Alizerin red and Von Kossa histochemistry, osteonectin and osteocalcin positivity were used for osteoblastic differentiation.

**Results:** It was observed that MSC cells proliferated in a similar manner to L-929 cells. They were confluent and exhibited similar behavior in wound closure. In the osteoblastic differentiation, bony like tissue with mineralized calcium formed as calcified islets. In the created wound model, cell proliferation and migration were standardized for comparison of the MH effect. All three MH produced a faster and more effective wound closure compared to those of control.

**Conclusion / Discussion:** There was significant effect of MH for wound healing. They have to be investigated by in vivo experiments which may go to phase studies for support to treatment protocols. Thus, it was thought that effective treatment with less costs and more patient life quality could be achieved by MH.

**Keywords:** Medicinal Plant, Wound Healing, Culture, Fibroblast, Mesenchymal Stem Cell, Osteoblastic Differentiation.

**References:**

- [1] Abdul Jalil MA, Shuid AN, Muhammad N. Osteoporotic fracture healing: potential use of medicinal plants from the tropics. *Curr Drug Targets*. 2013 Dec;14(14):1651-8.
- [2] Chaturvedi AP, Tripathi YB. Methanolic extract of leaves of *Jasminum grandiflorum* Linn modulates oxidative stress and inflammatory mediators. *Inflammopharmacology*. 2011 Oct;19(5):273-81.
- [3] Rahman N, Rahman H, Haris M, Mahmood R. Wound healing potentials of *Thevetia peruviana*: Antioxidants and inflammatory markers criteria. *J Tradit Complement Med*. 2017 Feb 14;7(4):519-525.



ORAL PRESENTATION

**MEDICINAL HERBS USED AS A SUPPORT FOR CANCER TREATMENT IN CULTURE**

Pınar Kılıçaslan Sönmez<sup>1</sup>, Fulya Gülbağça<sup>2</sup>, Mahmud Özkut<sup>1</sup>, Mesut Mete<sup>3</sup>, Fatma Şimşek<sup>2</sup>,  
Tahir Burhan<sup>4</sup>, Sevinç İnan<sup>5</sup>, Mehmet İbrahim Tuğlu<sup>1</sup>

<sup>1</sup>Department of Histology and Embryology, Faculty of Medicine, Manisa Celal Bayar University, Manisa, Turkey, [kicsln.pnr@gmail.com](mailto:kicsln.pnr@gmail.com)

<sup>2</sup>Department of Histology and Embryology, Faculty of Medicine, İzmir Katip Celebi University, İzmir, Turkey,

<sup>3</sup>Department of Neurosurgery, Faculty of Medicine, Manisa Celal Bayar University, Manisa, Turkey,

<sup>4</sup>Department of Gastroenterology, Faculty of Medicine, Manisa Celal Bayar University, Manisa, Turkey,

<sup>5</sup>Department of Histology and Embryology, Faculty of Medicine, İzmir Ekonomi University, İzmir, Turkey

**Objective / Purpose:** Cancer treatment is difficult and often unsuccessful where patients requires to use Medicinal Herbs (MH) as a supportive therapy. Unconsciously used MH can be useless or even harmful. In this study, the effect of MH as a support to paclitaxel (PT) therapy was examined in breast cancer cell lines.

**Material and Methods:** Pomegranate (*Punica granatum*, PG), Ganoderma Lucidum (Lingzhi-Reishi mushroom, GL) and Inula viscosa (*Arum italicum viscosa*, IV) were selected as examples of MH. MCF-7, MDA-MB-231, NR67 and 4T1 were used as breast cancer cell lines. TBS extracts were used in combination with PTX to investigate inhibition of proliferation by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium (MTT). Vascular endothelial growth factor (VEGF), endothelial nitric oxide synthase (eNOS) and Terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) staining were evaluated for vascularization, oxidative stress and apoptosis.

**Results:** It was determined that PT with MH significantly inhibited the proliferation of breast cancer cell line in a different degree by their agresivity. In the immunohistochemical evaluations performed with H-score, it was seen that VEGF staining was significantly decreased and e-NOS and TUNEL staining were increased when they were used together.

**Conclusion / Discussion:** MH produced more meaningful results when used in conjunction with the PT. It was understood that this supporting effect was caused by decreased vascularity and increased oxidative stress with apoptosis which induced cell death. It was thought that the use of MH would be important in terms of reducing the costs and side effects of classical drugs used in cancer treatment for more life quality of patient.

**Keywords:** Medicinal Plant, Breast Cancer, Cell Line, Vascularization, Oxidative Stress, Apoptosis.

**References:**

- [1] Kwan YP, Saito T, Ibrahim D, Al-Hassan FM, Ein Oon C, Chen Y, Jothy SL, Kanwar JR, Sasidharan S. Evaluation of the cytotoxicity, cell-cycle arrest, and apoptotic induction by *Euphorbia hirta* in MCF-7 breast cancer cells. *Pharm Biol.* 2016 Jul;54(7):1223-36
- [2] Xu C, Wang Q, Feng X, Bo Y. Effect of evodiagenine mediates photocytotoxicity on human breast cancer cells MDA-MB-231 through inhibition of PI3K/AKT/mTOR and activation of p38 pathways. *Fitoterapia.* 2014 Dec;99:292-9.
- [3] Nguyen MT, Ho-Huynh TD. Nam Dia long, a Vietnamese folk formula, induces apoptosis in MCF-7 cells through various mechanisms of action. *BMC Complement Altern Med.* 2017 Dec 4;17(1):522.