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Research Article

**A DESCRIPTIVE STUDY ON THE ROLE OF LEPTIN IN ORAL
WOUND HEALING IN TYPE II DIABETIC PATIENTS****Dr Muneeba Rasheed¹, Dr Javaria Jamil², Dr Muhammad Yasir³**¹Bahawal Victoria Hospital, Bahawalpur, ²Nishter Medical University, ³Lahore Medical and Dental College, Lahore.**Article Received:** February 2019**Accepted:** March 2019**Published:** April 2019**Abstract:**

Introduction: Diabetes mellitus is one of the most common chronic diseases in nearly all countries and continues to increase in numbers and significance, as economic development and urbanization lead to changing lifestyles characterized by reduced physical activity and increased obesity.

Objectives of the study: The main objective of the study is to analyze the role of leptin hormone in oral wound healing in type II diabetic patients.

Material and methods: This cross sectional study was conducted at Bahwal Victoria Hospital, Bahawalpur during January 2018 to October 2018. The data was collected from those patient who was suffering from type II diabetes from last 5 years. The data was collected from 100 patients through randomly sampling technique. The diabetic patient of both genders were considered for this study. For this purpose we collect the data to analyze the role of leptin hormone in wound healing process. The data were analyzed by using immunochemical assay.

Results: The differences between the control and diabetic groups at the three measuring time periods were extremely highly significant ($P = 0.000$). Totally, the means of expression after 21 days were noticed by higher values than that after 14 days in both control and diabetic groups, while the means of expression after 7 days were the lowest one.

Conclusion: It is concluded that leptin plays an important role in oral wound healing in normal patients as compared to diabetic patients. But it is not clear that why leptin is not helpful in diabetic patients. Leptin may promote wound healing in rat's normal oral mucosa more than in diabetic.

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INTRODUCTION:

Diabetes mellitus is one of the most common chronic diseases in nearly all countries and continues to increase in numbers and significance, as economic development and urbanization lead to changing lifestyles characterized by reduced physical activity and increased obesity. Leptin, a 16-kDa non-glycosylated polypeptide anti-obesity hormone consisting of 146 amino acids, is a product of the obese gene [1]. Although leptin is mainly produced by white adipose tissue, recent studies have demonstrated that leptin is also produced by placenta, stomach, skeletal muscles, brain and pituitary gland. Leptin is known to exhibit a variety of physiological actions on body weight homeostasis, lipid metabolism, hematopoiesis, thermogenesis, ovarian function, bone formation, angiogenesis and wound healing. The leptin receptor (Ob-R) is expressed in various tissues including the hypothalamus, adipose tissue, skeletal muscle and hepatocytes [2]. The multifunctionality of leptin and the wide distribution of its receptor suggest that leptin plays a variety of physiological roles not only as a systemic hormone but also as a local growth factor [3].

Wound healing requires a well-orchestrated integration of complex biological and molecular events of cell migration, cell proliferation, and extracellular matrix deposition. Over 100 known physiologic factors contribute to wound healing deficiencies in individuals with diabetes. Diabetes is a major cause of mortality globally, and it has been estimated that 400 million people worldwide will suffer from it by 2030 [4]. Despite the fact that hereditary qualities seems to assume an essential part in the advancement of diabetes, examine recommends that dietary decisions driven by natural and financial components are of critical significance. Amazing eating regimens assume an essential part in diabetes avoidance [5]. Suitable dietary adherence can enhance insulin affectability and glycemic control, and consequently add to way of life change and general personal satisfaction. Nonetheless, past research recommends that dietary adherence is seemingly among the most troublesome foundations of diabetes administration. Higher HEI scores demonstrate nearer adherence to current dietary rules for singular food and supplement gatherings [6]. For the sufficiency segments, for example, vegetables and natural product, a higher score demonstrates higher utilization. Dietary proposals depend on the useful effects of devouring products of the soil and expressly

stress their constructive outcomes of decreasing corpulence and certain sorts of growths [7].

Objectives of the study

The main objective of the study is to analyze the role of leptin hormone in oral wound healing in type II diabetic patients.

Material and methods:

This cross sectional study was conducted at Bahwal Victoria Hospital, Bahawalpur during January 2018 to October 2018. The data was collected from those patient who was suffering from type II diabetes from last 5 years. The data was collected from 100 patients through randomly sampling technique. The diabetic patient of both genders were considered for this study. For this purpose we collect the data to analyze the role of leptin hormone in wound healing process. The data were analyzed by using immunochemical assay.

Biochemical analysis:

For the process of immuno histochemical staining, 5 μ sections were prepared from each paraffin block and were deparaffinized in xylene solution and then dehydrated in graded alcohol series. To block the internal peroxidase activity, hydrogen peroxide (3%) in phosphate buffer solution was used. Then, antigen retrieval was done in a microwave oven (Panasonic 1380W) for 10 min, under the pressure of almost 2 atmospheres in 120°C. The samples were placed in phosphate buffer saline (PBS) immediately after each mentioned step. The positive control was used according to the manufacturer's instructions. The negative control was prepared by the replacement of primary antibody with PBS.

Statistical analysis:

The statistical analysis was carried out using Statistical Package for Social Sciences version 19 (SPSS Inc., Chicago, USA). Descriptive statistics such as mean, standard deviation, and proportion were used.

RESULTS:

The differences between the control and diabetic groups at the three measuring time periods were extremely highly significant ($P = 0.000$). Totally, the means of expression after 21 days were noticed by higher values than that after 14 days in both control and diabetic groups, while the means of expression after 7 days were the lowest one (Figure 01).

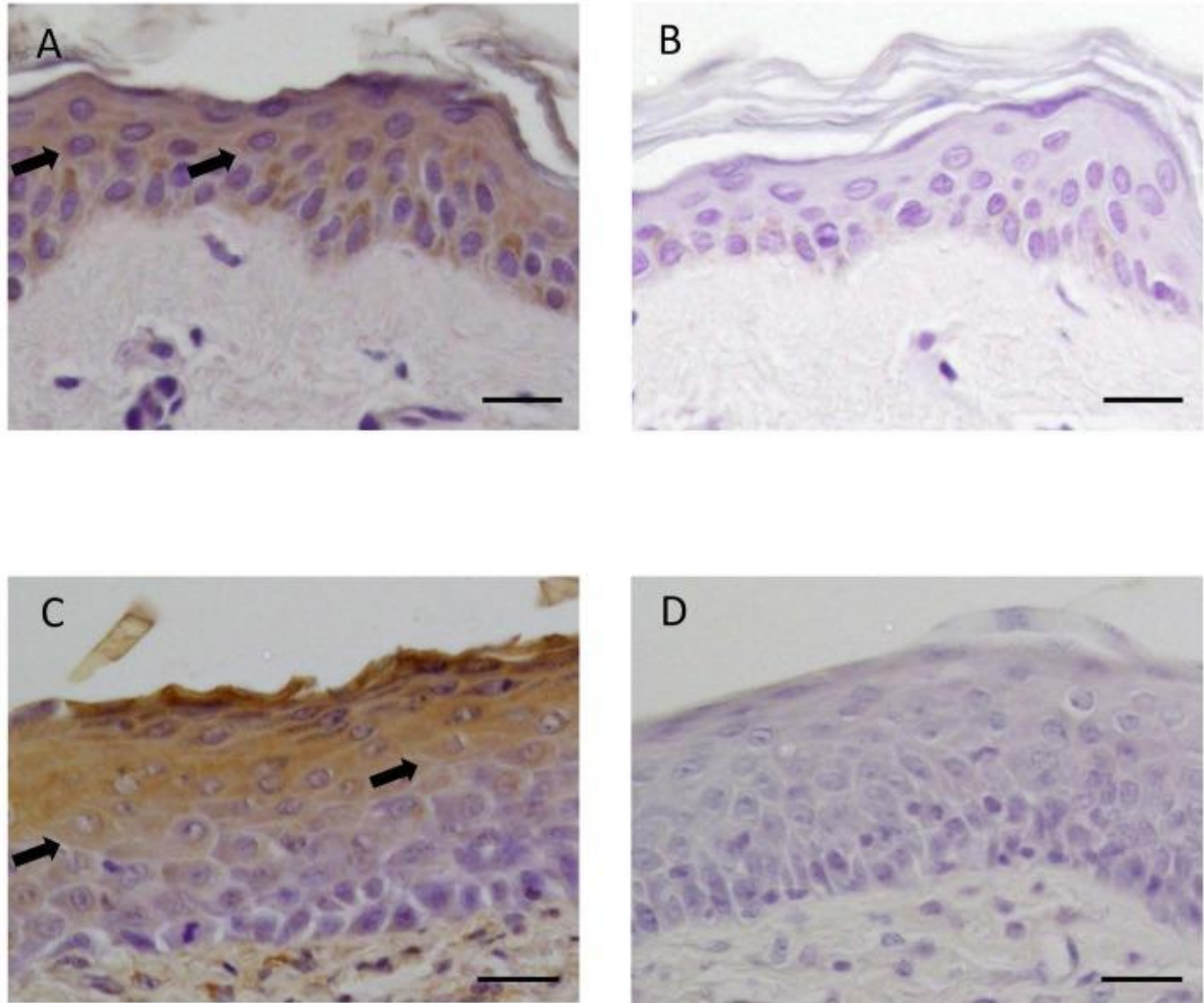


Figure 01: Expression of leptin in oral wound healing

The mean values of leptin expression in oral mucosa among control and diabetic rats at the three measuring points of time were demonstrated. Control group showed higher means of expression of leptin after 7, 14, and 21 days than the diabetic group

DISCUSSION:

Leptin is widely known as an anti-obesity hormone produced and secreted mainly by adipose tissue. Accumulating evidence shows that leptin is also produced/secreted by a variety of tissues/cells such as placenta, skeletal muscles and brain other than adipose tissue and that Ob-R, a most potent specific receptor, also expressed various cells/tissues such as hypothalamus, hepatocytes and endothelial cells. Despite the evidence shown by recent studies that local or systematic administration of cells and/or proangiogenic molecules could significantly improve angiogenesis and wound closure, diabetic wounds

remain a significant clinical problem [6]. However, it has been suggested that both systemic and topical leptin accelerate wound repair in diabetic mice, possibly through the direct interaction of leptin with its receptors in wounded skin, but do not appear to significantly stimulate wound angiogenesis [8]. In the present study, we evaluated the expression of leptin during healing of the incisional oral mucosal wound in both normal and diabetic rats to elucidate the role of leptin in promoting wound healing. The results of this study revealed that leptin was expressed in the epithelium and vascular endothelial cells and some stromal cells in subepithelial connective tissue [9]. This expression is more intense in the control group than the diabetic group. These findings suggest several possibilities regarding the mechanisms by which leptin promotes wound healing. One possibility is that leptin promotes wound healing by enhancing the epithelial cell proliferation and maturation. Another

possibility is that leptin stimulates angiogenesis in the connective tissue beneath the wound and promotes wound healing in the oral mucosa by accelerating the supply of nutrients, oxygen, and even some bioactive substances [2]. The oral mucosa serves many functions. The major one is the protection of the deeper tissues of the oral cavity; others include acting as a sensory organ and serving as the site of the glandular activity and secretion [10].

CONCLUSION:

It is concluded that leptin plays an important role in oral wound healing in normal patients as compared to diabetic patients. But it is not clear that why leptin is not helpful in diabetic patients. Leptin may promote wound healing in rat's normal oral mucosa more than in diabetic.

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