

86898_Auto_Edited.docx

Name of Journal: *World Journal of Experimental Medicine*

Manuscript NO: 86898

Manuscript Type: MINIREVIEWS

Understanding Wound Healing in Obesity

Wound Healing in Obesity

Asha Cotterell, Michelle Griffin, Mauricio A Downer, Jennifer B Parker, Derrick Wan, Michael Longaker

Abstract

Obesity has become more prevalent in the global population. It is associated with the development of several diseases including diabetes mellitus, coronary heart disease, and metabolic syndrome. There are a multitude of factors impacted by obesity that may contribute to poor wound healing outcomes. With millions worldwide classified as obese, it is imperative to understand wound healing in these patients. Despite advances in the understanding of wound healing in both healthy and diabetic populations, much is unknown about wound healing in obese patients. This review examines the impact of obesity on wound healing and several animal models that may be used to broaden our understanding in this area. As a growing portion of the population identifies as obese, understanding the underlying mechanisms and how to overcome poor wound healing is of the utmost importance.

Key Words: obesity, wound healing, adipokines, **tissue fibrosis, diabetes, preclinical animal models, hypertrophic skin scarring, wound tension, metabolic syndrome**

Cotterell A, Griffin M, Downer MA, Parker JB, Wan D, Longaker M. Understanding Wound Healing in Obesity. *World J Exp Med* 2023; In press

Core Tip: Obesity induces a chronic low-grade inflammatory state through increased release of adipokines, cytokines, and chemokines from excess adipose tissue. The chronic low-grade inflammation is thought to contribute to a dampened immune response during the inflammatory phase of wound healing leading to delayed wound healing. While there are several animal models used to study wound healing, they have not been widely applied to studying the effects of obesity on wound healing leading to a gap in the literature on this topic.

INTRODUCTION

Obesity has become more common over the past 40 years, with approximately 33% of the population being classified as overweight or obese (1). In adults, ¹obesity is defined as a body mass index (BMI) of 30.0 kg/m² or greater (2–4). Obesity accounts for up to 7% of total healthcare costs in developed nations, classifying it as a significant expenditure of national healthcare budgets (3). Obesity is associated with the development of several ²diseases including diabetes mellitus, coronary heart disease, hypertension, and certain forms of cancer, and has been associated with a decreased lifetime expectancy (2–4). Delayed wound healing seen in patients with diabetes mellitus, commonly associated with obesity, can be attributed to changes in the macro- and microvasculature, decreased production of growth factors, and poor quality of granulation tissue (5,6). Impaired wound healing can be caused by changes in the four phases of wound healing – hemostasis, inflammation, proliferation, and remodeling (Fig.1).

Due to the significant rise in obesity worldwide, it is important to understand the role that that this disease may have on wound healing. The purpose of this review is to highlight the impact of obesity on cutaneous wound healing and discuss future studies that must be performed to advance our understanding of the subject. We also aim to review the phases of wound healing and how they are impacted in obese states.

CONCLUSION

Approximately one third of the global population is classified as obese or overweight. With millions of patients sustaining cutaneous wounds annually, it is imperative to investigate the impact of obesity on wound healing and how to augment cutaneous wound healing in this growing population. Dysregulation of inflammatory responses due to production of pro-inflammatory mediators at baseline may contribute to poor wound healing outcomes.

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