

EVALUATION OF OSTEOCALCIN IN SERUM WOMEN BREAST CANCER IN IRAQ

Ruqayah Ali Salman¹ and Zainab A. Salman^{2*}

¹Department of Medical Laboratory Techniques, Al-Mussaib Technical Institute, Al-Furat Al-Awsat Technical University, 51009, Iraq

²Department of Basic Science, College of Dentistry, University of Baghdad, Iraq
*e-mail : za1693379@gmail.com

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ABSTRACT : It has been shown in available evidence that osteocalcin can play a part in cancer pathogenesis and osteocalcin gene mutation can contribute to the development of cancer. The aim of this study is to determine serum osteocalcin associated with breast cancer (BC) among Iraqi women population. A sensitive biomarker for detecting early progression of bone metastasis is urgently required. Sixty participants were enrolled in this study. The subjects were divided into two groups: First group 40 women patients with breast cancer, second group 20 included healthy women. Serum was collected for measurement of osteocalcin levels. Compared with healthy controls, women with breast cancer ($P<0.001$) osteocalcin significantly decreased. In conclusion, our results identify decrease serum level of osteocalcin in patients relative to control of breast cancer.

Key words : Breast cancer, serum, osteocalcin.

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INTRODUCTION

In 2018, 2088849 cases of breast cancer were registered worldwide, making 11,6% of all new cases of cancer the world's second largest (Li *et al*, 2021). Breast cancer (BC) accounts for 18% of all cancers in women and is the fifth leading cause of cancer mortality worldwide (Bray *et al*, 2012). According to the most recent WHO estimates, breast cancer is the most common type of cancer in 154 of the world's 185 countries, and it is the leading cause of cancer-related deaths in more than 100 of them (Bray *et al*, 2018). In 2019; 268,600 women newly diagnosed with BC, 41,760 of whom died of the disease were reported by the American Cancer Association (Siegel *et al*, 2019; American Cancer Society, 2019).

According to the most recent Iraqi cancer registry (2016) [Iraqi Cancer Registry (ICR), 2016], in Iraq, BC is the most common type of malignant women and is the second leading cause of death from cancer (Saaed *et al*, 2011). Increased awareness and progress in the screening and therapy of breast cancer patients have resulted in an improved prognosis and survival rate

(Society AC, 2019). The destruction of the breast induced by cancer is the result of a disturbed bone remodel, which has been characterized by the bone metastasis as a "vicious cycle" (Guise *et al*, 2006).

Osteocalcin is a small protein with a length of 49 amino acids (5.8 kDa). It contains 3 gamma-carboxyglutamic acid residues. It has an adversely charged surface which puts five calcium ions in the position of the important bone mineral component of hydroxyapatite (hA). OC is the highest level of non-collagen protein in bones, consisting of almost 2 % of the human body's total protein (Ivaska *et al*, 2004). It is essential for bone metabolism and is used as a clinical marker for bone turnover (Turki *et al*, 2013). Bones are primarily supported by hexagonal mineral hydroxyapatite (HA) (Ivaska *et al*, 2004). In order to play a role in the body's metabolism, Osteocalcin is secreted exclusively by osteoblasts and by nature builds up bones. Bone mineralization and ion homeostasis are also involved (Sachdeva *et al*, 2005).

Fig. 1 (Wang *et al*, 2020) shows the development of osteoclastic and osteoblastic bone metastases. The