



Statins and Breast Cancer: Evaluating the Cholesterol Level and Effect on Female Mortality Rates

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How to cite: Advani A, Jamal N, Ahsan Shabbir, Haresh Kumar. Statins and Breast Cancer: Evaluating the Cholesterol Level and Effect on Female Mortality Rates. *Innov Res Appl Biol Chem Sci*. 2026;4(1). DOI: <https://doi.org/10.62497/irabcs.208>
Available from: <https://irjpl.org/irabcs/article/view/208>

Dear Editor-in-Chief,

Breast cancer continues to be one of the leading causes of cancer death worldwide, with an especially dismal prognosis in cases of metastasis [1]. Recent studies have shown that there is a potential therapeutic benefit to statins, which inhibit the enzyme HMG-CoA reductase, not only in the treatment of atherosclerotic and vascular disease and dyslipidemia but also in breast cancer [2]. Unlike previous studies that demonstrated indirect inhibition by blocking serum lipoproteins, statins work through direct inhibition of the mevalonate pathway intracellularly [3].

This metabolic pathway has a close association with cholesterol metabolism, which is highly important for breast cancer biology. Cholesterol is an obligatory substrate that is required for estrogen synthesis, known to be a key factor in the development of malignancy in breast cancers that express hormone receptors. Moreover, the major product of the pathway, 27-hydroxycholesterol (27-HC), acts as a selective estrogen receptor modulator and an activator of LXRs that lead to

the development of tumors and metastases [4].

The system described above is additionally complicated by obesity, which, according to the World Health Organization, is a BMI greater than 30 Kg/M² [5]. Obesity changes systemic lipid profile and leads to an increase in cholesterol turnover, especially in postmenopausal women where fat becomes the main source of estrogen production [6]. This systemic link between a cholesterol-rich system, obesity, and rapid tumor development indicates the significance of metabolic control. In this regard, the role of nutrition and physical activity, in addition to medications, should be discussed in order to achieve the best possible lipid profile.

It should be noted that although these results indicate the effectiveness of optimal lipid levels for patients suffering from breast cancer, there is not enough scientific evidence of their validity. Prospective trials are needed to prove this.

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Accepted Manuscript