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Metabolic syndrome as a risk factor for the development of breast cancer in women and its impact on prognosis

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Objective: Metabolic syndrome (MS) is a complex metabolic disorder. The aforementioned main components are systemic arterial hypertension, insulin resistance, obesity, and dyslipidemia. Highly acclaimed evidence supports the hypothesis that MS may be associated with breast cancer (BC) development and worse prognosis. The increasing incidence rates of both MS and BC seem to corroborate this theory. This article aims to assess the association between MS and BC development, later diagnosis, and worse prognosis. **Methodology:** An inclusive literature review was conducted on PubMed and SciELO. **Results:** First, excess of adipose tissue characteristic of MS not only enhances the expression of pro-inflammatory factors but also increases the aromatization process. The latter is a neuroendocrine change that occurs in adipocytes and leads to greater estrogen synthesis, which increases the risk for the development of BC. It was concluded that MS is an independent risk factor for BC with a relative risk (RR) of 1.75%. MS is also associated with more aggressive and poorer differentiated tumors. Women with MS have higher rates of BC in stages III and IV. Furthermore, hyperinsulinemia and hyperglycemia are directly related to axillary lymph node involvement, high histological grade, and late staging. Moreover, it is known that women diagnosed with both MS and BC have worse oncologic prognosis. The aforesaid is exemplified by the increased recurrences and decreased survival in BC associated with high fasting plasma insulin levels. Additionally, obese women with BC have a worse prognosis and a higher risk of developing a second primary BC. **Conclusion:** As mentioned above, MS is significantly associated with an increased risk, invasive progression, and adverse outcomes of BC due to neuroendocrine changes, namely, abnormal estrogen levels. It is therefore strongly recommended to adhere to dietary strategies and regular physical activities in order to prevent MS. Consequently, there would be a possibility of reducing the incidence rates of BC.

Keywords: metabolic syndrome; breast cancer; lymph node metastasis; aromatase; estrogen effects.