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Original article

Impact of body mass index on the clinical outcomes of patients with HER2-positive metastatic breast cancer

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ABSTRACT

Background: Overweight and obesity are associated with an increased risk of developing many types of cancer, including breast cancer. Moreover, increased body mass index (BMI) seems to be associated with a worse prognosis in patients with HER2-positive early breast cancer. However, little is known about the impact of BMI on the clinical outcomes of HER2-positive metastatic breast cancer (MBC).

Methods: This was a multicenter retrospective cohort study including 329 consecutive patients with HER2-positive MBC treated with first-line trastuzumab-based regimens. BMI at the time of MBC diagnosis was collected. World Health Organization BMI categories were used: underweight <18.5, normal 18.5–24.9 Kg/m^2, overweight 25–29.9 Kg/m^2, and obese ≥30 Kg/m^2. The analyses were conducted using two categories: BMI < 25.0 (normal/underweight) and BMI ≥ 25 (overweight/obese). Progression-free survival (PFS) and overall survival (OS) rates were estimated using Kaplan-Meier method. Univariate and multivariate survival analyses were performed using the Cox's proportional hazards model. Disease response to therapy was analyzed using univariate and multivariate logistic regression.

Results: Overall, 176 (53.5%) patients were normal/underweight and 153 (46.5%) overweight/obese. Median PFS was 14.8 months in BMI < 25 group and 15.7 months in BMI ≥ 25 group (adjusted-HR 0.88; 95% CI 0.66–1.17; p = 0.387). Median OS was 58.6 months in BMI < 25 group and 52.6 in BMI ≥ 25 group (adjusted-HR 0.88; 95% CI 0.59–1.31; p = 0.525). Overall response rate was 71.7% and 65.9% (p = 0.296) and clinical benefit rate was 82.1% and 83.3% (p = 0.781) in BMI < 25 and BMI ≥ 25 groups, respectively.

Conclusions: BMI does not seem to be associated with clinical outcomes in HER2-positive MBC patients.

1. Introduction

Body mass index (BMI) is a weight-for-height ratio that has been

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used for decades by the World Health Organization (WHO) to assess quantitatively a person's relative body fatness [1]. It categorizes individuals into four groups: underweight (<18.5), normal weight (18.5–24.9), overweight (25.0–29.9) and obese (≥30.0). Despite its limitations, this standardized measure is now commonly used worldwide. Epidemiological studies including more than 68.5 million participants in 195 countries showed that the prevalence of obesity is 12.0% among adults worldwide [2]. Projections are alarming as it is estimated that by 2025 the prevalence of obesity will reach 18% and 21% in men and women respectively [3]. Obesity has been associated with an increased risk of developing many types of cancer including breast cancer [4]. In addition, pre- and postmenopausal breast cancer survivors appear to have an increased mortality risk if they are obese at time of diagnosis [5]. The limited data available in the metastatic setting suggest no impact of BMI on the outcome of patients treated with first line chemotherapy in unselected breast cancer patients [6].

Breast cancer is a heterogeneous disease composed of different subtypes [7]