Interference of fulvestrant in the determination of plasma immunoreactive levels of estradiol: a single-center experience with monitoring of treated breast cancer patients and with the transition to a new immunoassay. Illarramendi J, García San Martín MD, Arraras JI, Salgado J, De La Cruz S, Illarramendi JJ, Zabalegui MA. Services of Hematology, Medical Oncology and Clinical Biochemistry. University Hospital of Navarra. Pamplona. Spain.

Introduction: Fulvestrant (FLV) is a widely used drug for the hormone therapy of patients with breast cancer (BC). Patients on FLV therapy may have interferences on the determination of plasma estradiol (E2) with false elevations in the levels of this hormone. Several alerts were issued by regulatory agencies on this subject, that is included in the prescribing information. Many commercial preparations of FLV require proper refrigeration for conservation and transport of the drug. E2 levels may be used as an indirect marker of compliance and exposure to FLV. We also aim to test clinically if a newer improved immunoassay is free of such interference.

Methods: Retrospective study. Single-center academic institution. All patients (p.) had metastatic BC, were postmenopausal, and received standard doses of FLV as monotherapy or in combination with target therapy. E2 levels were measured by the Immulite 2000 Advanced Immunoassay System. During March 2024 we have tested the Access Sensitive Estradiol Assay in p. on maintained treatment with FLV. It is claimed that this immunoassay is free of interferences with FLV in vitro, but we are unaware of clinical confirming data in p. on treatment with FLV.

Results: 45 analytical studies were performed in 22 p. on treatment with FLV using the Immulite immunoassay. 43/45 displayed falsely elevated levels of E2. This effect occurred with the use of 8 different commercial presentations of FLV. 2/45 samples had levels below 28 (23 and 26) pg/ml that were attributed to incomplete compliance. Median value was 54 pg/ml (29-119), with only 4 samples having values over 80 pg/ml. 18 samples from 17 p. were analyzed with the Access Sensitive Estradiol Assay. All of them displayed postmenopausal E2 levels, with results below 15 pg/ml in 16/18 samples.

Conclusions: Our results clinically confirm that the study of E2 with the Access Sensitive Estradiol Assay is free of interferences by FLV in patients on treatment with standard doses and schedules of this drug. On the other hand, immunoassays with cross reactivity may have the potential to serve as an indirect signal of compliance and exposure to this drug.

Keywords: breast cancer, fulvestrant, estradiol, immunoassay.