Premenopausal women undergoing chemotherapy are at risk of premature ovarian failure and long term side-effects caused by premature menopause. However, knowledge about the rate of ovarian failure and potential markers to evaluate the ovarian reserve is limited, especially in the context of modern chemotherapy concepts. Therefore, Anti-Müllerian hormone (AMH) was measured at 3 time points in premenopausal patients of the SUCCESS study.

**Background**

The German SUCCESS trial is a multicenter phase III study comparing FEC-Docetaxel vs. FEC-Docetaxel + Gencitabine as adjuvant treatment in patients with node positive or high risk node negative primary breast cancer.

Blood samples were taken prior to and 4 weeks after last cycle of adjuvant chemotherapy, as well as after two years of follow up.

We retrospectively identified 170 patients stratified as premenopausal, aged ≤ 40 years at trial entry, who received 3 cycles of FEC (500/100/500mg/m2) q3w followed by 3 cycles of docetaxel (100mg/m2) q3w as one of the most commonly used chemotherapy regimens in Europe.

Serum AMH levels were evaluated in a central laboratory by a manual immunoassay AMH DSL ELISA (Diagnostic Systems Laboratories, Webster, USA).

**Results**

Median age within this subgroup was 36 years (21-40 years). 48.8% of the patients had a tumor stage pT1 and 54.7% were node positive. 69.4% were hormone receptor positive and 28.8% Her2 positive (Table 1). Median AMH level before adjuvant chemotherapy was 1.32 ng/ml (range -0.11-11.3 ng/ml). Immediately after chemotherapy AMH levels dropped in 98.6% of the patients below the threshold of detection (<0.1 ng/ml, range -0.1-0.21 ng/ml). No association to classical prognostic markers, such as tumor stage, lymph node involvement, etc. was observed.

After a follow up period of two years, serum was available from 101 patients. 73.3% of those patients showed no evidence of ovarian function indicated by AMH (<0.1 ng/ml, range -0.1-3.9 ng/ml). AMH levels prior to chemotherapy were significantly correlated with older age, with a reduction of 0.13 ng/ml per life year (p=0.003). 12 patients (7.1%) received optional gonadotropin-releasing hormone (GnRH) agonists during chemotherapy. No correlation to AMH-levels two years after cytotoxic treatment could be seen in this small subgroup.

In this retrospective analysis premenopausal patients showed a high rate of ovarian insufficiency reflected by low serum AMH levels immediately after cytotoxic treatment and after 2 years of follow up. In our cohort, GnRH agonists given as ovarian protectants during chemotherapy do not influence serum AMH two years after chemotherapy. Further data from prospective trials with longer follow up are needed to evaluate the role of serum AMH as a predictor of ovarian failure in breast cancer patients exposed to chemotherapy.

**Conclusion**

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