

Changes in hormone levels (E2, FSH, AMH) and fertility of young women treated with neoadjuvant chemotherapy (CT) for early breast cancer (EBC)

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Abstract #754

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Background

Patients <45 years with breast cancer have a risk of developing premature ovarian failure. The incidence of chemotherapy-induced amenorrhea ranges between 45-61% among different studies.^{1,2} Resumption of menses occurs often within two years of chemotherapy-induced amenorrhea,¹ with a median time of recovery of about 7 months.³

The regain of premenopausal follicle-stimulating hormone (FSH) and estradiol (E2) levels after treatment did not necessary lead to a restore of fertility. The anti-Müllerian hormone (AMH) seems to be more accurate than other hormones in predicting the ovarian reserve.

Materials and Methods

- 740 patients aged ≤45 years treated with anthracycline or taxane-based CT for EBC from 4 German neoadjuvant/adjvant trials were included. Blood samples were collected at baseline (n=740), end of treatment (EOT, n=740) as well as 6 (n=177), 12 (n=113), 18 (n=69), and 24 (n=47) months (m) after EOT. Only samples of patients without skipped samples in a row were considered for the laboratory evaluation. E2, FSH and AMH were centrally assessed.
- Postmenopausal hormone level according to the central laboratory were defined as FSH>12.4IU/l and estradiol E2<52.2ng/l; fertile level of AMH as 0.22-12.0ng/ml.
- The time of regain was defined as the timepoint within which premenopausal hormone levels were regained. It was assessed for patients with postmenopausal hormone levels at EOT using Kaplan-Meier product-limit method to account for those patients who did not have all samples available in a time sequence. Patients with no regain have been censored at the date of the last hormone assessment.
- The rate of regain of premenopausal serum level of E2 and FSH was reported as percentage per each timepoint after EOT in patients with postmenopausal level of E2 and FSH at EOT.

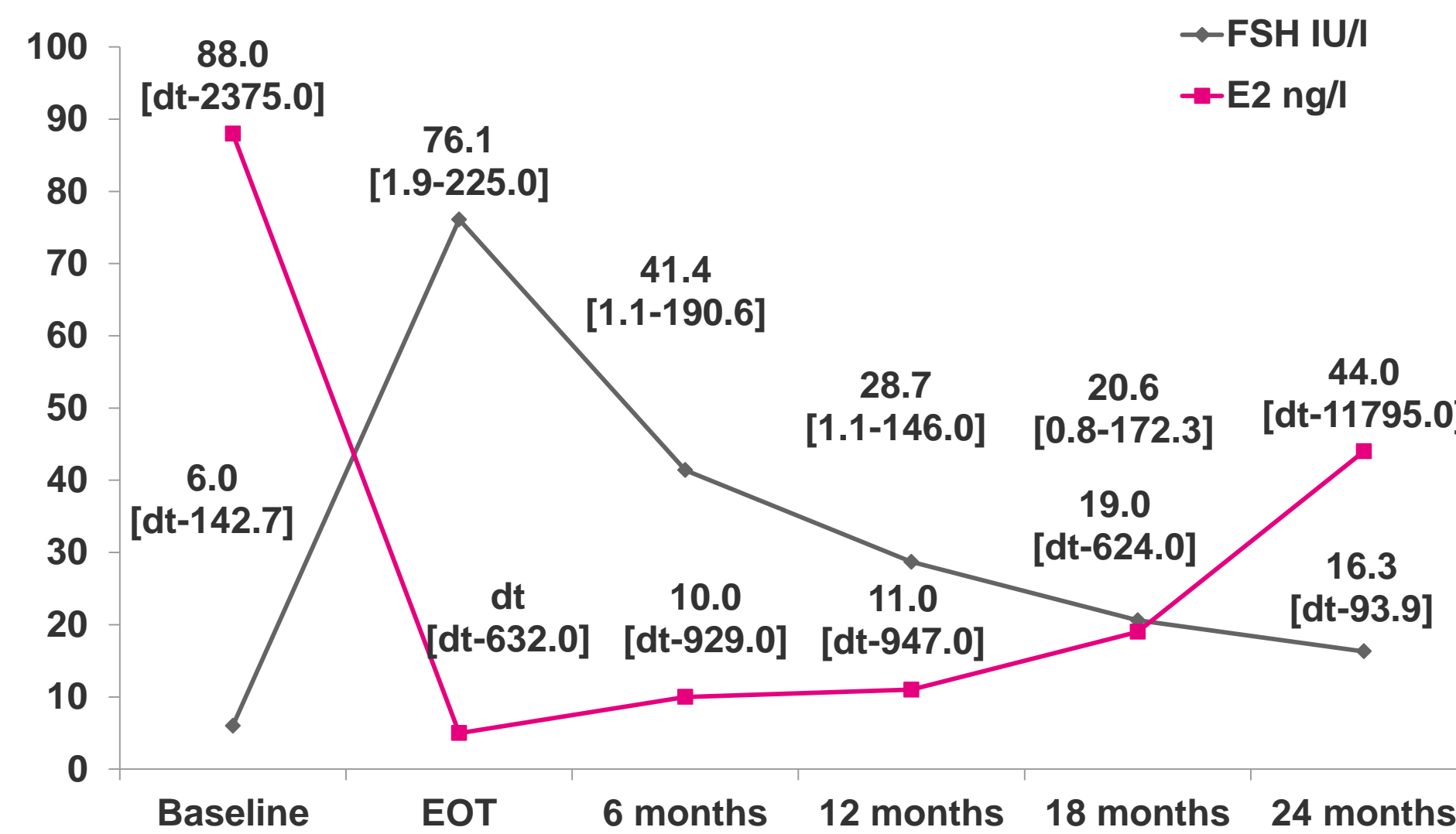
Objectives

- Median levels of FSH, E2 and AMH at EOT, as well as 6, 12, 18 and 24 months after EOT
- Time of regain of premenopausal hormone level (6, 12, 18, 24 months after EOT)
- Association between FSH and E2 with AMH at EOT as well as 6, 12, 18, 24 months after EOT.

Results

Median age was 40 (range 21-45) years; 57.2% had BMI 18.5-<25, 41.1% ≥25; 32% of the patients had luminal, 35.9% HER2+, 32.0% triple-negative BC. Overall, 8.1% of patients received taxane treatment only before EOT; 44.5% of patients received dose-dense CT; CT duration was 24 weeks for 47.4% of the patients, 12 weeks for 8.1% of the patients.

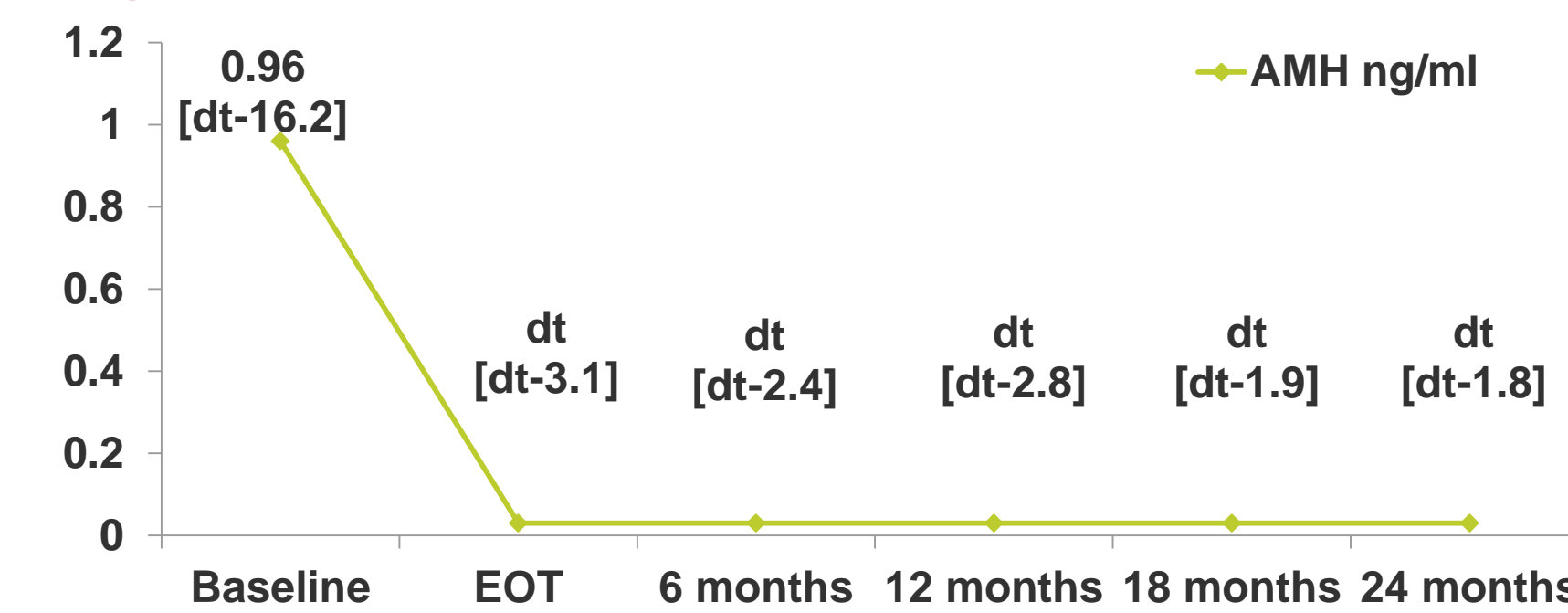
Fig.2: Distribution of median values of FSH, E2 per time point



Abbreviation: dt, detectable threshold
All values in the figure are given as % with 95% confidence interval

detectable threshold:
FSH<0.1IU/l,
E2<5ng/l

Fig.1: Distribution of median value of AMH per time point

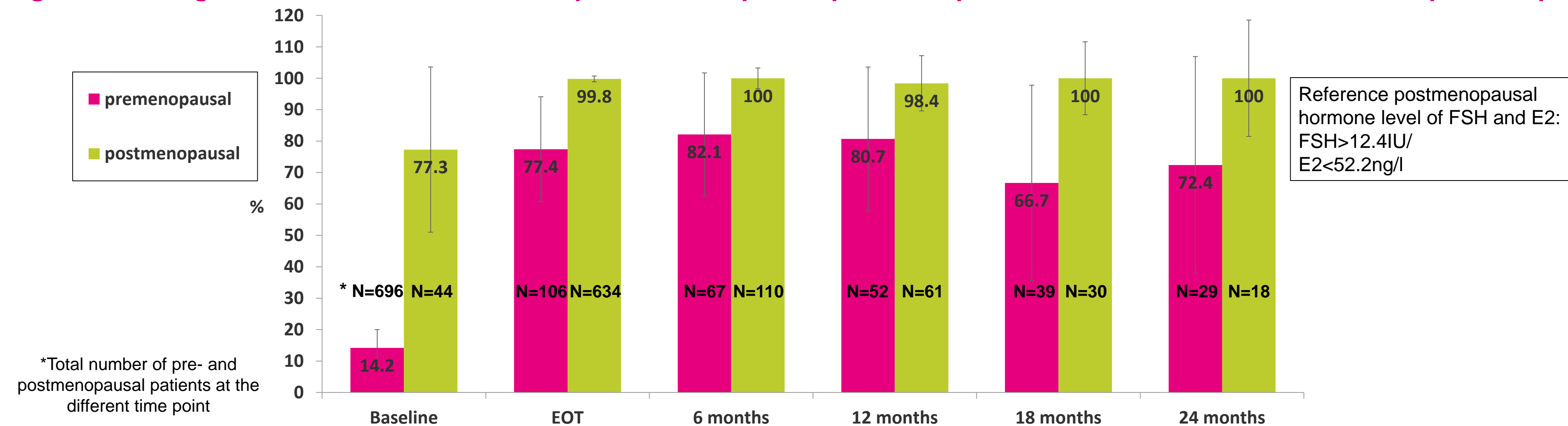


Abbreviation: dt, detectable threshold
All values in the figure are given as % with 95% confidence interval

Tab.1: Percentage of patients with AMH level above detectable threshold

Time point	Patients with AMH levels above dt (<0.03ng/ml) (%)
Baseline	95.4
EOT	15.6
6 months	26.0
12 months	29.2
18 months	34.8
24 months	38.3

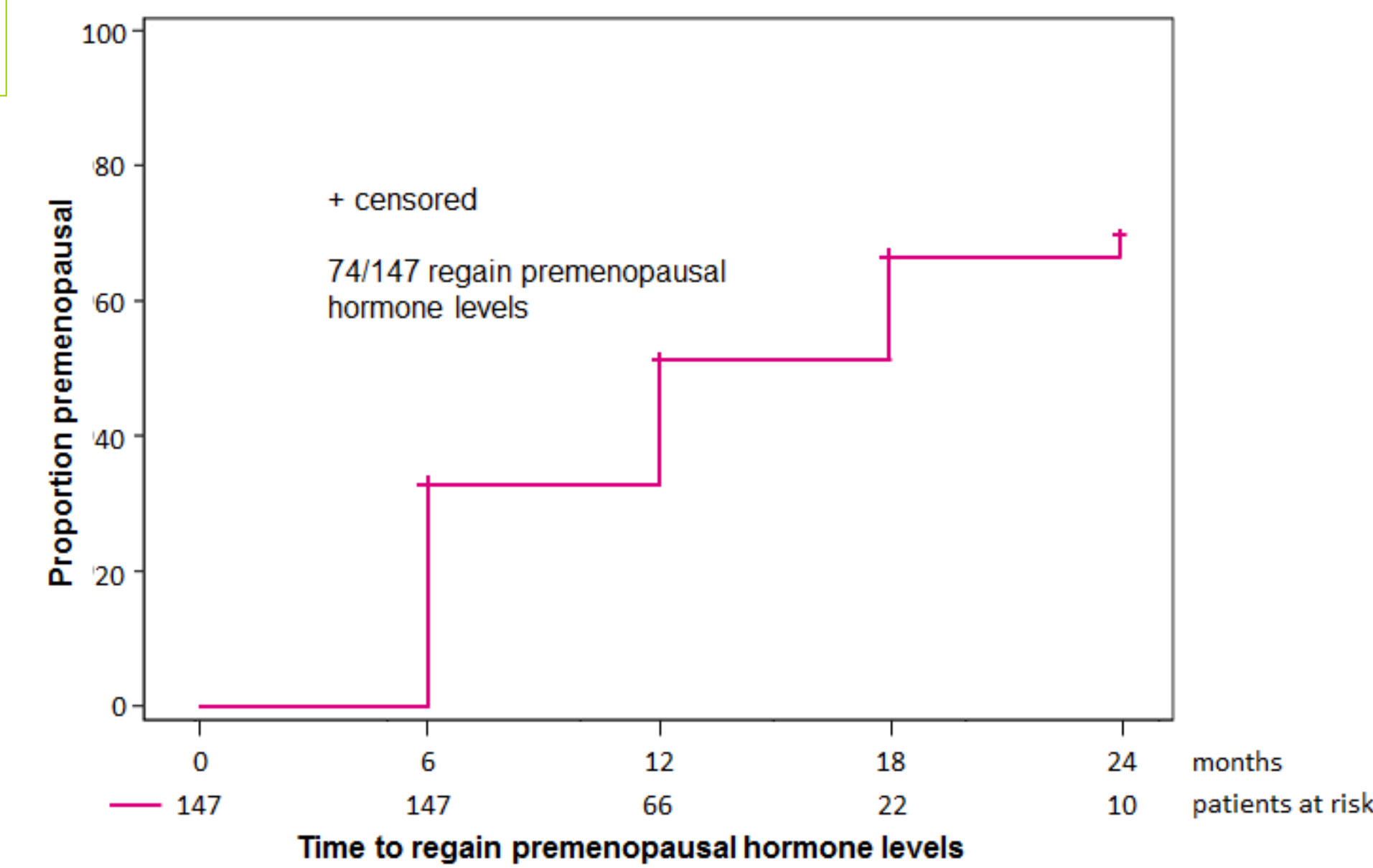
Fig.3: Percentage of non-fertile AMH levels in patients with pre- or postmenopausal hormone levels of FSH and E2 per time point



*Total number of pre- and postmenopausal patients at the different time point

Reference postmenopausal hormone level of FSH and E2:
FSH>12.4IU/
E2<52.2ng/l

Fig.4: Time to regain of premenopausal hormone levels



Tab.2: Patients with regain premenopausal hormone levels

Time point (months)	%*	95%CI
6	32.7	[25.7-40.9]
12	51.0	[42.3-60.4]
18	66.6	[55.2-77.6]
24	69.9	[57.8-81.3]

Conclusions

Nearly 70% of women regain premenopausal hormone levels of FSH and E2 within 2 years after end of CT. Despite that, only less than one third maintain their fertility potential as predicted by AMH. AMH is a very sensitive marker for the prediction of fertility function after CT for EBC.

References

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