Chemotherapy-induced anaemia in patients treated with dose-dense regimen: Results of the prospectively randomised anaemia substudy from the neoadjuvant GeparOcto study

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Background

Iron deficiency anaemia is a frequent adverse event in cancer patients treated with chemotherapy. Clinical use of parenteral (IV) ferric carboxymaltose (FCM) has been shown to be an efficient treatment for anaemia and can prevent red blood cell transfusion[1]. This substudy compared the use of FCM with physician's choice (PhCh) anaemia therapy in breast cancer (BC) patients treated with CT.

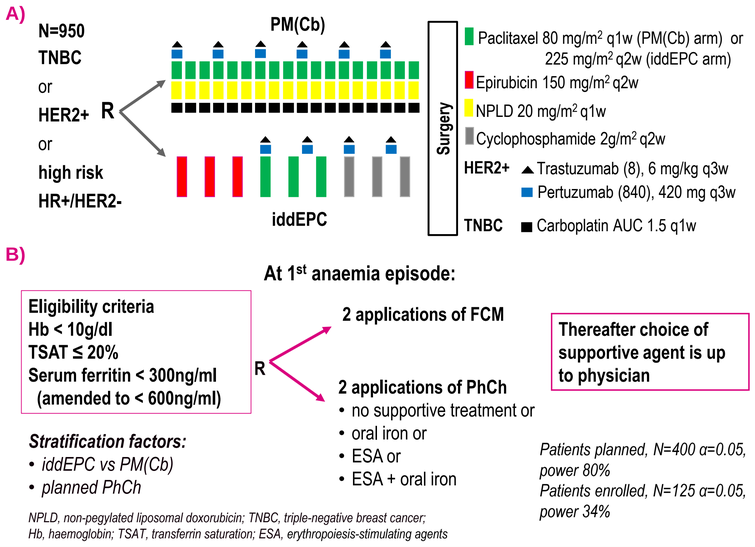
Patients and Methods

Study design of the GeparOcto main and supportive anaemia studies are shown in Fig. 1.

Primary objective: to compare the frequency of patients achieving Hb≥11g/dl at 6 weeks of anaemia treatment with FCM vs PhCh. If an additional treatment was performed during the anaemia study, this was counted as not reached the primary endpoint.

Main secondary objectives: median time to achieve Hb≥11g/dl; changes in iron parameters (serum ferritin and transferrin saturation [TSAT]) at baseline (BL) vs different time points (4, 8, 12, 16 weeks and end of chemotherapy [EOT]); blood transfusion in both arms. Patients without Hb assessment after BL were counted as not achieved Hb≥11g/dl.

Figure 1: Study design of the GeparOcto main (A) and supportive anaemia (B) studies



NPLD, non-pegylated liposomal doxorubicin; TNBC, triple-negative breast cancer; Hb, haemoglobin; TSAT, transferrin saturation; ESA, erythropoiesis-stimulating agents

Results

Figure 2: Consort statement

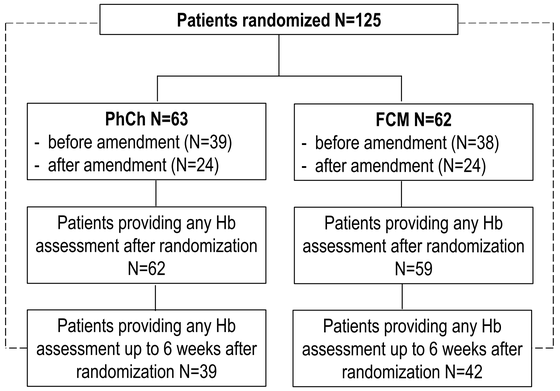


Figure 3: Time to achieve Hb ≥ 11g/dl

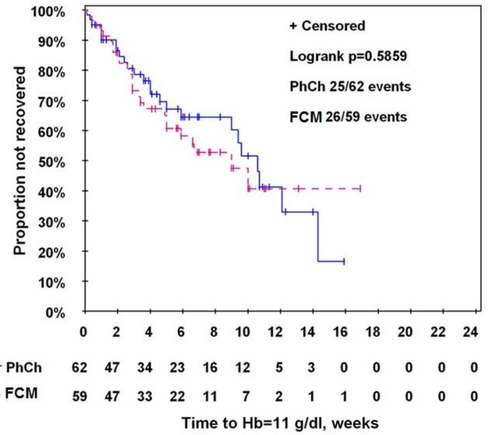
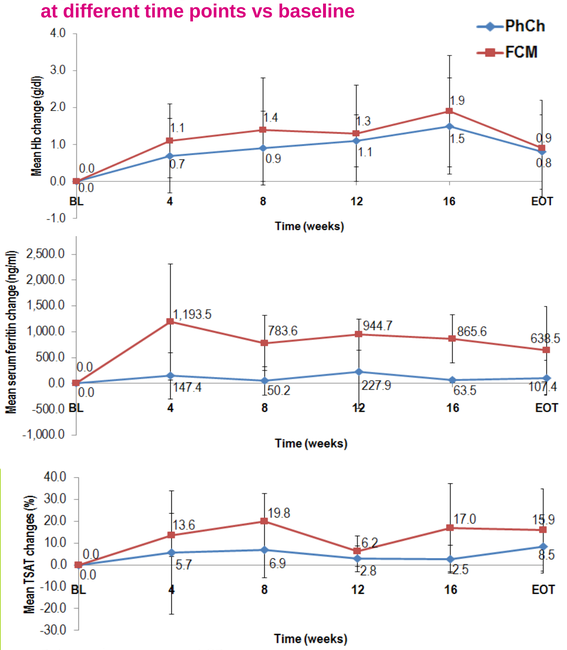


Figure 4: Changes of Hb, serum ferritin and TSAT levels at different time points vs baseline



Data are shown as mean ±SD

Table 1. Baseline characteristics

Parameter	PhCh N=63	FCM N=62	p-value
Continuous variables			
Age [years] median (range)	47 (30-66)	46 (26-64)	0.861
Hb [g/dl] at 1st anaemia episode median (range)	9.7 (8.0-9.9)	9.6 (8.7-9.9)	0.665
Hb [g/dl] at last assessment before randomisation median (range)	9.6 (7.9-11.8)	9.5 (7.6-11.1)	0.328
Serum ferritin [ng/ml] median (range)	199 (3.0-504)	201 (16.8-551)	0.851
TSAT [%] median (range)	14.0 (4.0-76.0)	14.0 (4.0-20.0)	0.705
Categorical variables			
Serum ferritin <300 ng/ml	51 (81.0)	52 (85.2)	0.634
Serum ferritin ≥300 ng/ml	12 (19.0)	9 (14.8)	
missing	0	1	

- Overall, 40 (32.0%) patients (35.5% in FCM and 28.6% in PhCh arm; p=0.447) reached Hb level of ≥11g/dl at 6 weeks.
- Median time to achieve Hb≥11g/dl was 9.0 weeks (95%CI 5.0–not reached) with FCM vs 10.6 weeks by PhCh (95%CI 5.9–14.3) corresponding to a hazard ratio (HR) 1.17 (95%CI 0.67–2.03) (Fig. 3).
- The mean Hb changes at different time points vs baseline were comparable in both arms whereas the mean serum ferritin and TSAT changes were increased in FCM as compared with PhCh arm at earlier time points (Fig. 4).
- Overall, in the PhCh arm 17 patients received oral iron substitution, 8 ESA, 2 both, 7 other treatment and 18 did not receive any anaemia treatment.
- During anaemia therapy, blood transfusion was performed in 2 patients in the FCM and 5 in the PhCh arm (p=0.246) whereas after 6 weeks of therapy 5 patients in the FCM and one in PhCh arm received blood transfusion (p=0.205).

Conclusions

This is the first study investigating IV iron treatment for dose-dense CT-induced anaemia in BC. 32% of patients reached Hb≥11g/dl at 6 weeks, irrespective of anaemia therapy. FCM treatment increased ferritin and TSAT levels but did not improve anaemia in comparison to PhCh in this setting.

References

1. Steinmetz T, Tschechne B, Harlin O, et al. Clinical experience with ferric carboxymaltose in the treatment of cancer- and chemotherapy-associated anaemia. Ann Oncol. 2013;24:475-82

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