SA.LA.TO. - RESULTS ON ANTIOXIDANT VITAMINS AND OXIDATIVE STATUS

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BACKGROUND

The purpose of this study was to evaluate the serum levels of antioxidant vitamins A, C, E and the oxidative status markers AOPP and TAC in ESRD patients treated with either online hemodiafiltration (HDF-OL) or hemodiafiltration with endogenous re-infusion by using polyphenylene HF membranes (HFR) or Synclear 02 membranes (SUPRA).

Moreover, both the capacity and the kinetics of vitamin C adsorption to the HFR and Supra cartridges were evaluated.

METHODS

Forty ESRD patients from 18 Sardinian dialysis centers were enrolled in a prospective, multicenter, randomized, crossover study. After a 4-month washout stabilization period in HDF-OL, each patient was randomized to a sequence of treatments (HFR followed by SUPRA or viceversa) with each treatment applied over 6 months (Fig. 1).

At the beginning of the study and at the end of each treatment period, blood and/or ultrafiltrate (UF) samples were collected and used to evaluate i) the pre- and post-session plasma levels of vitamins C, A and E, advanced oxidation protein products (AOPP), total antioxidant capacity (TAC) and retinol binding protein (RBP), and ii) the pre- and post-cartridge UF levels of Vitamin C.

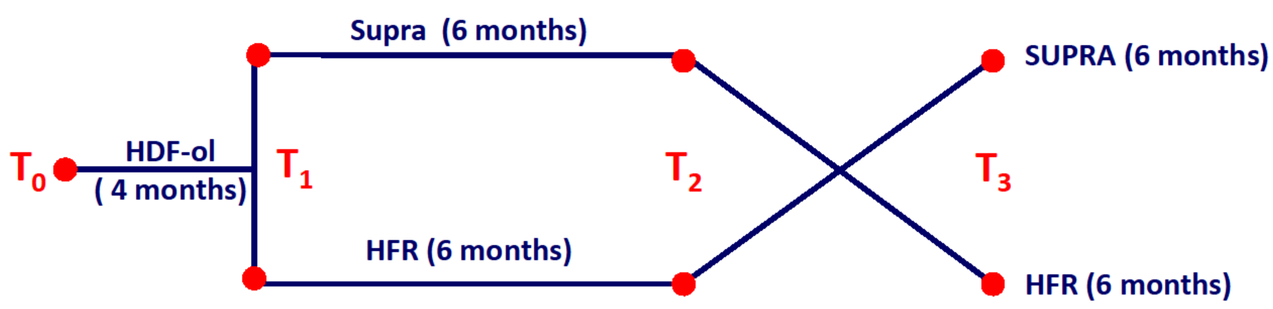

Fig 1. Schematic representation of the study design. Red points represent the sampling points.

RESULTS

Compared to HDF-OL, both SUPRA and HFR long-term treatments i) induced a significant decrease of AOPP levels and ii) lowered TAC levels down to normal values (Fig. 2).

Lower-than-normal vitamin C levels were found in all patients with no long-term effects produced by any treatment. However, in comparison with HDF-OL, a significant, intra-dialytic saving of this vitamin was observed in both HFR and SUPRA. Since UF analyses showed no vitamin C adsorption by the cartridges, the above evidence is plausibly accountable for by the re-infusion of the endogenous vitamin.

Higher-than-normal Vitamin A levels were found in all patients; in the long-term, significantly lower values were associated to SUPRA as compared to HFR treatment.

As expected, higher-than-normal RBP values were also found in all patients groups, with significantly lower values associated to SUPRA as compared to HFR treatment. An evident, yet not statistically significant RBP upward trend was observed in the long-term in either treatment, even if the intra-dialytic RBP removal by SUPRA was significantly higher than that produced by HFR. Accordingly, a concomitant VitA/RBP ratio decrease became evident in the long-term. Being RBP regarded as a negative acute phase protein, a likely explanation of the above results is that the amelioration of the inflammatory status induced by both HFR and SUPRA over HDF-OL accounts for the observed RBP increase.

Vitamin E levels were in the normal range in all groups with no statistically significant long-term effects produced by any treatment

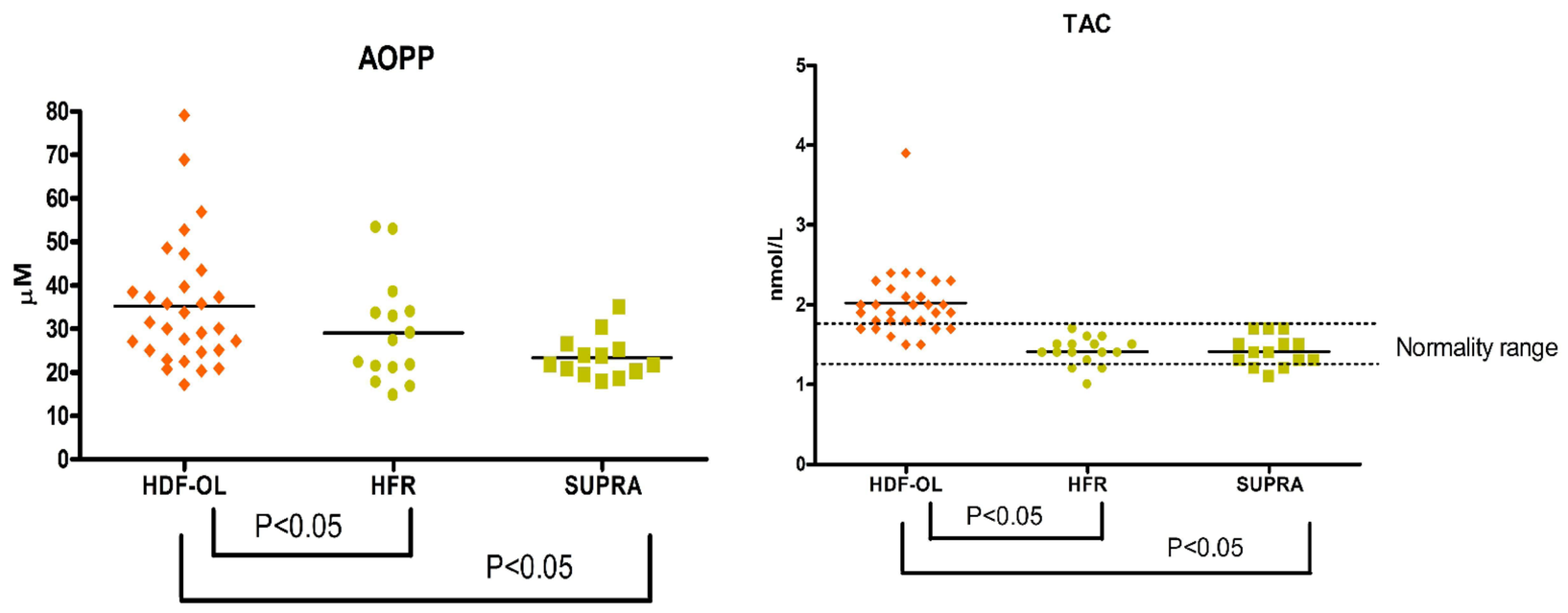

Fig 2. AOPP (left) and TAC (right) levels at the end of the three dialytic treatments

CONCLUSIONS

In conclusion, treatments with endogenous reinfusion as compared to HDF-ol significantly improve oxidative status in ESRD patients.

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