REACTIVE OXYGEN METABOLITES AND CHRONIC LOW INTENSITY INFLAMATION IN HAEMODIALYSED PATIENTS - INFLUENCE OF AGE AND DURATION OF HAEMODIALYSIS

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INTRODUCTION AND AIM OF THE STUDY: Chronic low intensity inflammation and increased oxidative stress are recognized as important risk factors for increased morbidity and mortality in haemodyalised patients.
The aim of this study was to elucidate the connection between reactive oxygen metabolites (dROMs), hsCRP, age and duration of haemodialysis.

PATIENTS AND METHODS: The study was started with all 63 patients from the department of haemodialysis in our hospital. In the beginning both hsCRP and dROMs were measured and the age of patients and duration of haemodialysis were recorded. hsCRP was measured on biohenical analyzer Olympus AU400 by immuno-turbidimetric method, using original reagents from Olympus. dROMs concentrations were also measured on biochemical analyzer Olympus AU400, but using reagents from Diacron and theirs application for our analyzer, kinetic mode and working reagent procedure. Because of the lack of reagents for dROMs test, during the follow-up study only hsCRP was measured (three, six and ten months later from the first measurement). Only patients with lowest value (or at least within the same class: < 1; 1-3; > 3 mg/l) of hsCRP at the first measurement were included (n=45), considering this value as their basal hsCRP concentration.

Patients fulfilling inclusion criteria were divided in three groups:

I group (n=24) with dROMs concentrations lower than 400 CARR U (normal and low to middle level of oxidative stress, according to Diacron's recommendations for reference values; only three of the patients had normal levels of oxidative status: 250-300 CARR U);
II group (n=13) with dROMs from 401-500 CARR U (high level of oxidative stress);
III group (n=8) with dROMs over 501 CARR U (very high level of oxidative stress).

All data were calculated by Student's t-test, two-tailed distribution, two-sample equal variance or two-sample unequal variance, as appropriate.
As statistically significant were considered differences between groups where it was $p<0.05$.

RESULTS: There was a statistically significant difference for hsCRP between first and third group (1.59 +/- 1.16 : 11.91 +/- 10.21 mg/l; $p<0.05$) and second and third group (1.72 +/- 1.27 : 11.91 +/- 10.21 mg/l; $p<0.05$).
There was also a statistically significant difference for age between first and third group (57 +/- 10 : 67 +/- 11 years; $p<0.05$) and first and second group (57 +/- 10 : 66 +/- 11 years; $p<0.025$).
There was not a significant difference for duration of haemodialysis between these three groups.
All results obtained from this study are presented in the Table No. 1.

Table 1: dROMs and hsCRP in haemodialyzed patients: influence of age and duration of HD

	Age (years)	Duration of HD (years)	hsCRP (mg/l)
1. dROMs up to 400 CARR U	$57 \pm 10^{*\#}$	8 ± 7	$1.59 \pm 1.16^{\#}$
2. dROMs 400 -500 CARR U	66 ± 11	6 ± 7	$1.72 \pm 1.27^{\#}$
3. dROMs above 500 CARR U	67 ± 11	12 ± 9	$11.91 \pm 10.21^{\#}$

* statistically significant compared to second group
\# statistically significant compared to third group

From results presented in the table it can be noted that within the same age group (patients from second and third group) those with longer, yet not statistically significant duration of haemodialysis, have higher concentrations of dROMs (different classification group) and significantly higher concentrations of hsCRP.

Two and a half years from the beginning of the study the mortality rate for all three groups was calculated and the results were as followed:

4 % within the first group,
8 % within the second group and
25 % within the third group.

CONCLUSION: From our results we conclude that very high levels of oxidative stress followed by a significantly increased chronic inflammation lead to a disadvantageous prognosis for aged haemodialysed patients.

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