

# Saliva antioxidant capacity and erythropoietin treatment needs in maintenance hemodialysis patients.

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## Introduction

Patients on chronic dialysis are constantly exposed to oxidative stress, which can be enhanced additionally by renal anaemia. According to latest studies, the administration of erythropoietin stimulating agents (ESA) may decrease lipid peroxidation and reduce oxidative stress in hemodialysis (HD) patients. There is currently also an interest in the evaluation of total antioxidant capacity (TAC). The assessment of TAC in saliva, samples of each are easy to collect and non-invasive to patients, is also regarded as a sensitive indirect test of organism antioxidant status. The aim of the study was to assess whether TAC in saliva is associated with renal anaemia and its treatment needs in HD patients.

## Material and methods

Sixty two participants (39 males and 23 females) on maintenance hemodialysis 3 times a week, mean age  $60.9 \pm 15.7$  years old were involved in the study.

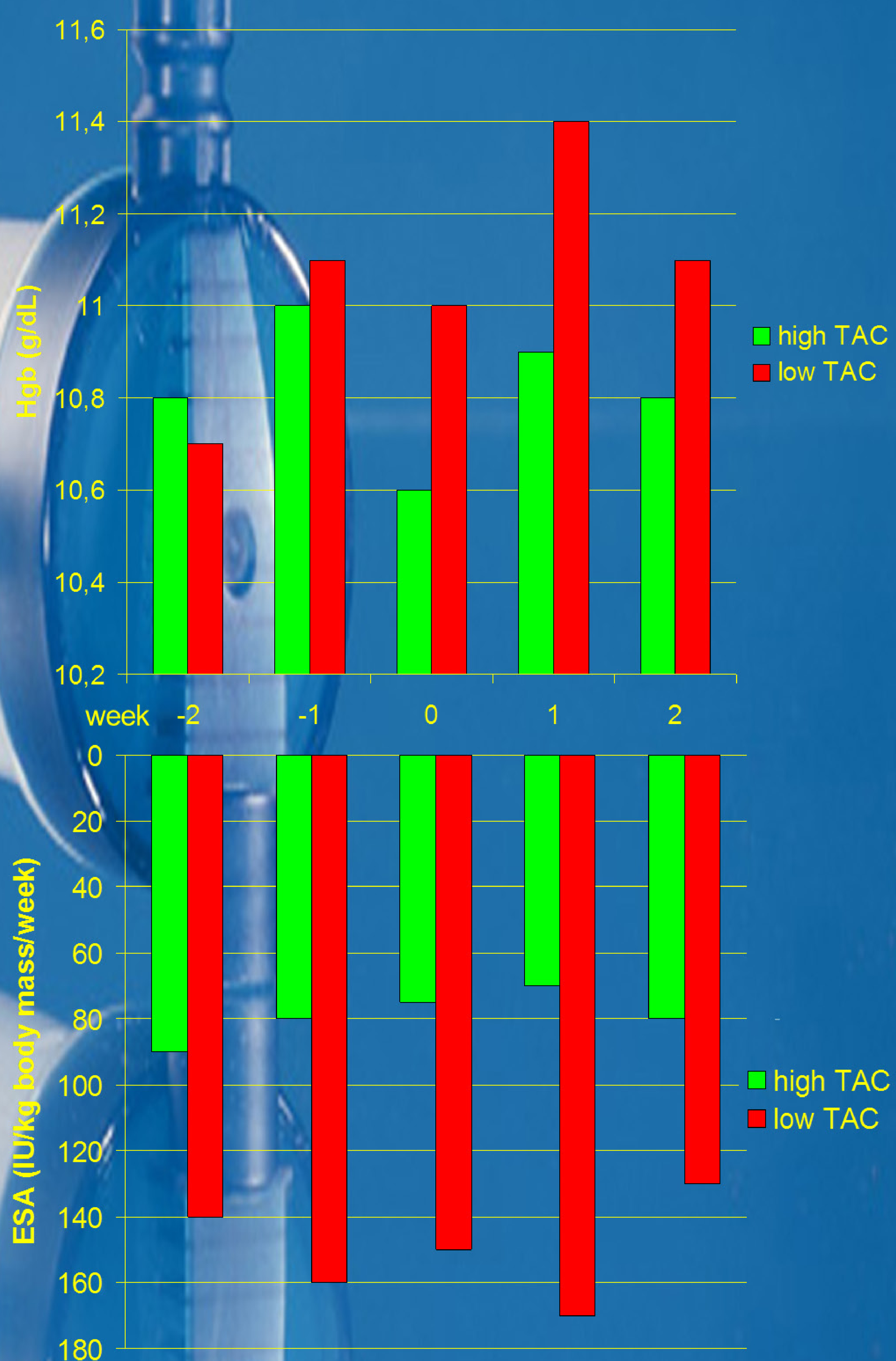
In the morning, before a mid-week HD session an unstimulated saliva samples was collected in all patients. Saliva samples were evaluated for anti-oxidative capacity using by enzyme-linked immunosorbent assay (ELISA). The four months hemoglobin concentration variations and erythropoietin stimulating agents (ESA) dose changes were analyzed (two months prior and two after saliva collection) and their means were calculated. Patients were divided into two groups: High ESA (27 patients) and Low ESA (35 patients) according to the calculated Roc curve, which indicated the cut off value of ESA dose as  $111.9 \text{ IU/kg body mass/week}$  (AUC 0.61; 95%CI 0.5-0.9). The study groups were sex, age, diabetes occurrence, smoking habits and caries indices matched.

## Results

In both groups the mean Kt/V values were comparable i.e. in High ESA  $1.2 \pm 0.1$  versus  $1.3 \pm 0.2$  in Low ESA ;  $p=0.31$ . The calculated mean ESA doses (IU/kg body mass/week) were  $153.2 \pm 21.9$  versus  $80.4 \pm 19.5$ , respectively. Although hemoglobin levels were similar in both groups, as well as other parameters, the saliva total antioxidant capacity was significantly lower in High ESA group – Table 1. The strong negative correlation between TAC and ESA doses was established ( $\rho=-0,66$ ;  $p=0.007$ ).

## Conclusion

Although the decreased TAC was not associated with lower hemoglobin value, it may influence on ESA doses which are needed in the maintenance phase of renal anaemia treatment in HD patients.



	High ESA	Low ESA	P value
<b>Hemoglobin (g/dL)</b>	<b>11.0 ± 1.33</b>	<b>10.8 ± 1.15</b>	<b>NS</b>
<b>Transferrin saturation (%)</b>	<b>26.1 ± 1.9</b>	<b>27.3 ± 2.2</b>	<b>NS</b>
<b>Ferritin (ng/mL)</b>	<b>323 ± 11.7</b>	<b>321 ± 10.2</b>	<b>NS</b>
<b>Albumins (g/L)</b>	<b>38.3 ± 1.8</b>	<b>37.9 ± 1.6</b>	<b>NS</b>
<b>CRP (ng/L)</b>	<b>3.9 ± 2.6</b>	<b>3.7 ± 2.1</b>	<b>NS</b>
<b>Total saliva antioxidant capacity</b>	<b>0.71 ± 0.14</b>	<b>1.07 ± 0.21</b>	<b>p = 0.0002</b>