Effect of Desmopressin on Protein S and Antithrombin III in Uremia

T.	Tekin	Akpolat ^a
M.	Metin	Eser ^b
D.	Davut	Albayrak ^c
N.	Nurol	Arik ^a

Departments of ^aNephrology, ^bInternal Medicine and ^cHematology, Ondokuz Mayıs University School of Medicine, Samsun, Turkey

Dr. Tekin Akpolat, Ondokuz Mayıs Üniversitesi, Tıp Fakültesi, Hemodiyaliz Bölümü, TR-55139 Samsun (Turkey),
Fax+90 362 4576041

Table 1. Effect of DDAVP on plasma PS and AT-III antigen levels in uremic patients

Dear Sir,

Desmopressin (DDAVP), a synthetic analog of the antidiuretic hormone, has been shown to be effective in the management of uremic bleeding [1], but the precise mechanism of DDAVP on potentiating hemostasis in uremia remains unclear. A low activity of protein C (PC) has been described in uremia [2-4] and PC activity is further reduced after infusion of DDAVP in uremic patients [2, 4]. This further decrease in PC activity might contribute to the explanation of the normalization of the bleeding tendency after DDAVP infusion. Protein S (PS) and antithrombin III (AT-III) may have some role in the inactivation of PC activity [5]. The aim of this study was to clarify the effect of DDAVP on AT-III and PS in uremia. Seventeen predialysis uremic patients (mean age 47.7 years; range 25-65) were selected for the study. None of the patients had received blood transfusions or had taken any drugs known to affect platelet function within 3 weeks prior to the study. The individuals were at rest during the investigation, which was performed in the morning beginning at about 8.00 a.m. DDAVP (Minirin, Ferring, Sweden) was administered at a dose of 0.3 µg/ kg of body weight added to 50 ml physiologic saline infused over 15 min. Blood samples were collected before the infusion and 30 and 120 min after DDAVP infusion by venipuncture. PS antigen was measured by enzyme-linked immunosorbent assay (Thrombostica Protein S, Organon Teknika BV, The Netherlands). AT-III antigen was measured by an immunonephelometric method (TurboxTM Antithrombin III, Orion Diagnostica, Finland). The results are expressed as mean values ± standard error of mean. Wilcoxon's signed-rank test and Friedman's test were performed for statistical analyses.

Table 1 shows the effect of DDAVP on PS and AT-III antigens in uremic patients. DDAVP did not have any significant influence on PS and AT-III antigens. No major side effects were observed during the infusion of DDAVP.

The precise mechanism of DDAVP in depressing PC activity has not been clearly defined. In a previous report [5], we have shown that DDAVP infusion does not have any influence on two well-known PC inhibitors, plasminogen activator inhibitor-3 and α₂-antitrypsin. Alterations in PS and AT-III may affect PC activity and this effect on PC activity might

contribute to the explanation of the normalization of the bleeding tendency after DDAVP infusion in uremia. The present study shows that the mechanism by which DDAVP lowers PC activity was not to be connected with changes in PS and AT-III antigen levels in uremic patients. As far as we know, this is the first report describing changes in PS and AT-III antigen levels after DDAVP infusion in uremia. Do alterations of PS and AT-III activity possibly have a role in the inactivation of PC activity? More studies are needed to clarify the exact mechanism of the effect of DDAVP on PC activity in uremia.

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