

## Association of Central Retinal Vein Obstructions and Anticardiolipin Antibodies

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- ✓ In recent years, a relationship between the rising levels of anticardiolipin antibodies (ACA) and recurrent venous and arterial thrombotic complications has been shown. In this study, we aimed to determine whether there was a relation between central retinal venous obstruction (CRVO) and ACA.

Blood samples from 24 patients with CRVO and 29 age matched controls were studied for IgG and IgM ACA by Enzyme-Linked Immunoabsorbant assay (ELISA). Antibody levels for IgG ACA and for IgM ACA greater than 20 GPL U/ml and 10 MPL U/ml were accepted as positive. IgG ACA positivity was found in 37.5% of CRVO patients and 20.6 % in controls. On the other hand, IgM ACA positivity was detected in 29.1% and 17.2% of CRVO patients and controls groups, respectively. No statistically significant differences were found between patients and control groups for IgG ACA and IgM ACA positivity ( $p>0.05$ ).

Although, we found no statistically significant differences with regard to the levels of ACA in CRVO patients compared to controls, we believe that the finding of markedly higher levels of ACA in CRVO patients may help to identify the cause of CRVO in cases of unknown aetiology.

**Key words:** Central retinal vein obstruction, Anticardiolipin antibody

- ✓ **Santral Retinal Ven Tıkanıklıklarının Antikardiolipin Antikorları ile ilişkisi**

Son yıllarda tekrarlayan arteriyel ve venöz trombotik komplikasyonlar ile antikardiolipin antikorları arasında bir ilişkinin varlığı saptanmıştır. Bu çalışmada santral retinal ven tıkanıklığı (SRVT) ile antikardiolipin antikorları (AKA) arasında bir bağıntının olup olmadığını ortaya koymayı amaçladık.

SRVT tespit edilen 24 hastanın ve hastalarla uygun yaş grubundan seçilen 29 kontrol'un kan örnekleri alınıp IgG ve IgM antikardiolipin antikorları ELISA yöntemi ile araştırıldı. Antikor seviyesi IgG için 20 GPL U/ml, IgM için 10 MPL U/ml'nin üstü pozitif olarak kabul edildi.

IgG AKA pozitifliği, SRVT hastalarında %37.5, kontrollerde ise %20.6 olarak tespit edildi. IgM AKA pozitifliği ise SRVT hastalarında %29.1, kontrollerde %17.2 olarak bulundu. İstatistiksel değerlendirmede hastalar ve kontrol grubu arasında anlamlı farklılık tespit edilmedi ( $p>0.05$ ).

İstatistiksel açıdan anlamlı farklılık bulunmasa da santral retinal ven tıkanıklığı olan hastalarda kontrol grubuna göre antikardiolipin antikor pozitifliği, özellikle de IgG AKA yüksek olarak bulundu. SRVT etiyojisi tespit edilemeyen hastalarda antikardiolipin antikorlarının araştırılması faydalı olabilir.

**Anahtar kelimeler:** Santral retinal ven tıkanıklığı, antikardiolipin antikoru

### INTRODUCTION

Antibodies binding to negatively charged phospholipids such as cardiolipids, phosphatidyl serine, phosphatidyl inositol, phosphatidic acid and phosphatidyl gliserol

are called "antiphospholipid antibodies". Anticardiolipin antibodies (ACA) are considered as a subgroup of antiphospholipid antibodies which can be determined by ELISA technique<sup>(1-3)</sup>.

Numerous studies demonstrated the induction of ACA in vascular thrombosis, but its precise contribution in the process awaits clarification. However, the putative role of ACA in the development of vascular obstruction has opened a way to the understanding of the pathogenesis of these disorders especially in young age group patients<sup>(2,3)</sup>.

ACA is known to be in high levels in systemic diseases associated with vasculitis. Furthermore, retinal vein obstruction risk increases particularly around the age of 50, and many factors are believed to have a role in the aetiology. The aim of this report was to assess the value and significance of ACA status in central retinal vein obstruction cases enrolled irrespective of the aetiology.

#### MATERIALS AND METHODS

24 patients with central retinal vein obstruction as diagnosed by ophthalmologic examination and FFA in the Ophthalmology Department of Medical Faculty at the Ondokuz Mayıs University were enrolled for the study. Ocular and systemic examinations were carried out in detail for the patients, and 9 cases were considered as of ischaemic type, while the remaining 15 cases were of non-ischaemic type. Age-matched 29 individuals some of whom were with hypertension and diabetes were included to serve as the control group.

For ACA assay, 5 millilitres of blood samples taken from the patients were individually centrifuged and the aliquots of supernatants were stored at -70 °C until used.

Determinations of IgG and IgM ACA were assessed by using an ELISA kit developed by Harris et al (Zeus Scientific, Inc. Cardiolipin IgM and Cardiolipin IgG ELISA test system). IgG antibody levels greater than 20 GPL U/ml and IgM levels greater than 10 GPL U/ml were considered as positive. The results were compared for significance by using the Chi-square test and Student-t test.

#### RESULTS

The incidence of central vein obstruction

among our study groups (mean age: 59±3.50 for the patients, 57±4.32 for the control group; range inclusive of both groups: 31 to 77) is summarised in Table I, and shows that the highest number of cases are clustered in the age group of 60-70.

**Table I.** The Incidence of CRVO in Patient Groups Based on Their Age.

Age groups	CRVO (n)	CRVO (%)
> 40	1	4.9
40-50	5	20.8
50-60	6	25.0
60-70	8	33.3
< 70	4	16.7
<b>Total</b>	<b>24</b>	<b>100</b>

Associated systemic diseases of the patients with CRVO are presented in Table II. No statistically significant differences were found between the CRVO and the control group with regard to the hypertension or diabetes.

**Table II.** Association of Systemic Diseases in the Patients and the Controls.

Groups	Age	Hypertension	Diabetes
CRVO (24)	59.02±3.50	14 (%58.3)	3 (%12.5)
Control (29)	57.21±4.32	17 (%62.9)	3 (%10.3)
p	> 0.05	> 0.05	> 0.05

The ACA test results are summarised in Table III. Although IgG and IgM ACA seropositivities were more frequent in CRVO group than controls, there was no statistically significant difference between two groups.

**Table III.** IgG and IgM ACA Levels in the Study Groups.

Groups	IgG		IgM	
	n	%	n	%
CRVO (24)	9	37.5	7	29.1
Control (29)	6	20.6	5	17.2
p	> 0.05		> 0.05	
Odds Ratio (OR)	2.30		1.97	

## DISCUSSION

It has been repeatedly demonstrated that the ACA has an anti-coagulant effect, even though the event of thrombosis in vivo has been reported to be paradoxically increased by ACA. In the latter case, the process was shown to be related to the effect of ACA on the vascular endothelium and thrombocyte membranes containing phospholipids similar to the effect of thrombotic factors like local prostacylin, antithrombin III and protein C<sup>(3,4)</sup>. Numerous factors including hypertension and arteriosclerosis have been shown to have an effect in the retinal vascular process. In the present study, our results suggested that hypertension and arteriosclerosis may not be involved in the process of retinal vein obstruction. Amongst the search for the culprit has been the reports of cases of retinal vein obstruction with elevated levels of ACA. For example, an isolated case of retinal vasculitis with high ACA levels was reported by Zaman et al.<sup>(5)</sup> in 1993. Furthermore, a total of 140 patients with vascular occlusion were studied by Bertram et al.<sup>(6)</sup>, and 9% of them were found to have high titres of ACA. Similarly, Bernard et al<sup>2</sup> reported that of the 75 patients studied 5% showed high levels of ACA, and also Cobo-Sorino et al.<sup>(7)</sup> reported a 22.5% of positivity for antiphospholipid antibodies in patients with retinal vascular occlusion and suggested that antiphospholipid antibodies may be a risk factor for the development of vaso-occlusive retinopathy. On the contrary, in a study reported by Chabanel et al<sup>(8)</sup>, no association between retinal vein occlusion and the levels of ACA was found in 20 patients. In our study, we found the levels of ACA IgG in 37.5% of the 24 patients tested and IgM in 29.1% of the 24 patients tested to be markedly high in patients with central retinal vein occlusion, but the levels of both antibodies were not statistically significant to suggest an association with regard to the central retinal vein occlusion.

ACA, as reported by several researchers<sup>(9-12)</sup> appears to be found rather in higher levels in

patients with and younger than 45 years retinal vasculitis. In our study, we were not able to assess the presence of any association between the levels of ACA and age under 45 years due to fewer number of patients available.

## CONCLUSION

The present study found high levels of ACA in patients with central retinal occlusion, and suggests that the ACA levels must be tested in patients diagnosed to have a central retinal vein occlusion.

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