Cerebral Sinus Thrombosis as a Potential Hazard of Antifibrinolytic Treatment in Menorrhagia

Anat Achiron, MD, PhD, Michael Gornish, MD, and Eldad Melamed, MD

We describe a 42-year-old woman who developed superior sagittal and left transverse sinus thrombosis associated with prolonged e-aminocaproic acid therapy for menorrhagia. This antifibrinolytic agent has been used in women with menorrhagia to promote clotting and reduce blood loss. Although increased risk of thromboembolic disease has been reported during treatment with e-aminocaproic acid, cerebral sinus thrombosis has not been previously described. Careful use of e-aminocaproic acid therapy is recommended. (Stroke 1990;21:817–819)

The antifibrinolytic agent e-aminocaproic acid (EACA) is used to prevent clot lysis by inhibiting the fibrinolytic system in a variety of clinical conditions including disseminated intravascular coagulation, uterine bleeding, and subarachnoid hemorrhage. The inhibition of fibrinolysis can cause adverse thromboembolic effects such as myocardial infarction, pulmonary embolism, and glomerular capillary, arterial cerebral, superior vena caval, and intracardiac thrombosis.

We describe a woman in whom the use of EACA for menorrhagia was associated with the development of superior sagittal and transverse cerebral sinus thrombosis simulating the clinical picture of pseudotumor cerebri. We wish to draw attention to the risk of cerebral sinus thrombosis during prolonged antifibrinolytic treatment in women with menorrhagia.

Case Report

A 42-year-old previously healthy woman complained of 6 months of intermittent frontal headaches and episodes of blurred vision lasting several seconds. These symptoms coincided with 7 months of treatment for menorrhagia with 3 g EACA/day during the days of blood loss. On admission, physical examination revealed an obese woman with bilateral papilledema. A brain computed tomogram was normal. On lumbar puncture an opening pressure of 28 cm H2O was found; results of cerebrospinal fluid chemistry, routine laboratory tests, and coagulation studies (prothrombin time, partial thromboplastin time, and tests for presence of the lupus anticoagulant) were all normal or negative. Angiography revealed superior sagittal and transverse sinus thrombosis without demonstration of deep cerebral venous circulation. The patient was treated with dexamethasone, mannitol, and acetazolamide without improvement.

Two days after admission, she lost consciousness for several minutes, and bilateral pyramidal signs occurred. Repeat lumbar puncture showed an opening pressure of 49 cm H2O and normal cerebrospinal fluid chemistry. Ophthalmologic examination disclosed increased papilledema with hemorrhages and exudates. A lumboperitoneal shunt resulted in clinical improvement. Ten days later, a T1-weighted magnetic resonance imaging scan (Figure 1) showed high-intensity signals in the superior sagittal and left transverse sinuses compatible with sinus thrombosis.

The patient had a favorable outcome, improving over 2 months. The papilledema subsided, her headaches disappeared, and neurologic examination was normal.

Discussion

A monoaminocarboxylic acid that lacks the α amino group, EACA is used in the treatment of excessive bleeding from systemic hyperfibrinolysis, usually in acute, life-threatening clinical situations. Its therapeutic value in the management of bleeding disorders, particularly in the presence of systemic hyperfibrinolytic states, has been extensively investigated and proven. EACA acts by competitive inhibition of the activator that converts plasminogen into plasmin, a proteolytic enzyme that is primarily responsible for degradation of thrombus. By means of this clot-stabilizing effect, EACA promotes clot maturation and thereby decreases the likelihood of further hemorrhage. Tovi and Thulin suggested that
antifibrinolytic drugs reach the brain by crossing the blood–brain barrier and thus inhibit local fibrinolysis. In recent years, EACA and tranexamic acid have also been used in young women to prevent massive menstrual blood loss by decreasing local fibrinolysis within the uterus. Although favorable results have been reported with this treatment, there has been concern about its possible thromboembolic compli-
cations. Reports of such complications are summarized in Table 1. Rydin and Lundberg\textsuperscript{15} reported intracranial arterial thrombosis in two women treated for menorrhagia with tranexamic acid for 1 year. Agnelli et al\textsuperscript{16} described a 26-year-old woman who died of left internal carotid artery thrombosis after taking tranexamic acid to prevent uterine bleeding. Our patient developed cerebral sinus thrombosis during treatment with EACA. We have been unable to find earlier reports of cerebral sinus thrombosis in young women taking EACA for menorrhagia. However, given after a subarachnoid hemorrhage, EACA has been reported to cause middle cerebral artery thrombosis.\textsuperscript{17}

Our patient was obese, a state associated with hyperestrogenism,\textsuperscript{18} which is a known risk factor for hypercoagulability. Theoretically, this could have made her more susceptible to the development of cerebral sinus thrombosis during EACA administration.

We suggest that EACA should not be routinely prescribed for women with menorrhagia, especially when they have risk factors such as obesity that predispose to thromboembolic complications.

References

Key Words • antifibrinolytic agents • thrombosis • menorrhagia

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### Table 1. Intracranial Thrombosis Due to Antifibrinolytic Agents in Women Treated for Menorrhagia

<table>
<thead>
<tr>
<th>Authors</th>
<th>Age (yr)</th>
<th>Drug</th>
<th>Dose (g/day)</th>
<th>Duration of treatment</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rydin and Lundberg\textsuperscript{15}</td>
<td>31</td>
<td>Tranexamic acid</td>
<td>3–4.5</td>
<td>1 year</td>
<td>Middle cerebral artery</td>
</tr>
<tr>
<td></td>
<td>32</td>
<td>Tranexamic acid</td>
<td>0.5–1</td>
<td>1 year</td>
<td>Posterior cerebral artery</td>
</tr>
<tr>
<td>Agnelli et al\textsuperscript{16}</td>
<td>26</td>
<td>Tranexamic acid</td>
<td>1.5</td>
<td>40 days</td>
<td>Internal carotid artery</td>
</tr>
<tr>
<td>Present case</td>
<td>42</td>
<td>e-Aminocaproic acid</td>
<td>3</td>
<td>7 months</td>
<td>Superior sagittal and transverse sinus</td>
</tr>
</tbody>
</table>
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