Ophthalmic manifestations of 107 cases with hemolysis, elevated liver enzymes and low platelet count syndrome

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ABSTRACT

الأهداف: استعراض اضطرابات العين المختلفة في السلاسل السريرية لحالات متلازمة انحلال الدم وارتفاع إنزيمات الكبد وانخفاض تعداد الصفائح.

الطريقة: تم التخطيط للدراسة كمسألة تطلعية وأجريت في الفترة ما بين عام 2002م وحتى2005م. شملت الدراسة 107 مريضاً يعاني من متلازمة انحلال الدم، وارتفاع أنزيمات الكبد، وانخفاض تعداد الصفائح، الذين حضروا على كلا من عيادة العيون أو عيادة أمراض النساء والولادة – المدرسة الطبية لجامعة جازيانتيب – جازيانتيب – تركيا.

النتائج: تم تقييم حالة 107 مريضاً. بلغ العمر الفعلي 25.5 عاماً (22–36 عاماً). كانت المعدلات الفعلية: 2.5 الحمل، 1.3 إنجاب، تعداد الصفائح 55,200 في المليمتر المكعب، 308.7U/l استقلاب أميني أسبارتيتي، 255.4U/l استقلاب أميني ألانيني، و 1711.6U/I لاكتات نازعة للهيدروجين. توفي أربعة مرضى (3.7%) على الرغم من تلقي العلاج الملائم. تمت ملاحظة العمى القشري في ثلاث حالات (2.7%)، انفصال مصلي في الشبكية لدى أربع حالات (3.7%)، وتغيرات بسيطة في ارتفاع ضغط الدم لدى 18 حالة (16%).

خاتمة: المضاعفات العينية محتملة الحدوث أثناء وبعد الإصابة بهذه المتلازمة مباشرة. وعلى الرغم من أن جميع المتغيرات العينية تشفى بعد الولادة القيصرية إلا أنه لا بد لأطباء العيون الاهتمام باضطرابات الشبكية عند مواجهة هذه المضاعفات المميتة للحمل.

Objective: To present various ophthalmologic disorders in a clinical series of hemolysis, elevated liver enzymes and low platelet count (HELLP) syndrome cases.

Methods. This is a prospective clinical study performed between 2002 and 2005. One hundred seven HELLP patients attended in either Departments of Ophthalmology or Obstetrics and Gynecology, Medical School, Gaziantep University, Gaziantep, Turkey were evaluated.

Results. Mean age was 25.5 (22-36 years). Mean levels were 2.5 gravidity, 1.3 parity, 55,200/mm^3 platelet counts, 308.7 U/l aspartate transaminase, 255.4U/l alanine transaminase, and 1711.6 U/I lactate dehydrogenase. Four patients died (3.7%) despite the proper treatments. Cortical blindness was observed in 3 cases (2.7%), serous retinal detachments in 4 (3.7%), and mild hypertension changes in 18 (16%).

Conclusion. Ophthalmic complications are possible during and after this syndrome. Almost all ophthalmologic changes recover after delivery by cesarean section, nevertheless, it is essential that ophthalmologists should be aware of retinal disorders when this fatal complication of pregnancy is encountered.

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The term hemolysis, elevated liver enzymes and low platelet count (HELLP) syndrome, an acronym for hemolysis elevated liver enzymes and low platelets, was first coined by Weinstein in 1982.[1] It has been speculated as to whether it is a different entity or a syndrome in relation with preeclampsia. It is still unknown what cause(s) this syndrome, however, a few factors have been encountered on patients. It is now widely accepted that HELLP syndrome is a clinical entity that clinicians must know how to recognize and treat in a similar manner to severe preeclampsia.[2] The HELLP syndrome occurs in 0.2-0.7% of all pregnancies while preeclampsia is observed in 5-7% of pregnancies. Thus, superimposed HELLP syndrome develops in 4-12% of females with preeclampsia or eclampsia.[3] This syndrome leads to severe consequences including acute renal, hepatic failures, placental detachment, intracranial hemorrhage, ophthalmologic disorders, and mortality in pregnant women. Early diagnosis is essential due to high as 25% mortality rate.[3,4] Pregnancy should be terminated in the case of this syndrome. There have been a few case reports dealing with the consequences of the HELLP syndrome regarding the ophthalmic system of pregnant women, some of which are cortical blindness, occlusion of central retinal vein, and serous retinal detachments.[5-9] These reports have separately documented HELLP syndrome facts in very few patients. The need of a broad and full documentation in a sole paper on this syndrome seems to be obvious, and a requirement to achieve an understanding on the evaluation of this syndrome. This study therefore, aimed at presenting the ophthalmic signs of HELLP syndrome in a clinical series of 107 cases in a sole report.

Methods. All of the 107 patients with HELLP syndrome were evaluated between November 2002 and May 2005, in the Departments of Ophthalmology and Obstetrics and Gynecology, Medical School, Gaziantep University, Gaziantep, Turkey. The study was approved by the Local Research Ethics Committee of Medical School, Gaziantep University. Written consent has been obtained from all patients or their first-degree relatives. All cases were diagnosed in the Department of Obstetrics, and Ophthalmologic examinations were performed by an ophthalmologist. Patients with hemolytic anemia (lactate dehydrogenase >600 IU/L), elevated liver enzymes (aspartate aminotransferase >70 IU/L), and thrombocytopenia (platelet count <150,000/mm^3) were accepted as having HELLP syndrome and have been included in the content of the study. The patients who were diagnosed in another medical center and referred to our medical center were not included in this prospective planned clinical case study. Ophthalmologic examinations included: visual acuity (VA) using Snellen chart, anterior segment examination using penlight, biomicroscope, intraocular pressure by tonopen, dilated fundus examination of the retina by direct ophthalmoscope, and B-Scan ultrasonography. Cortical blindness assessments were carried out when the pupil reactions were intact and there was no reason for the low vision. Magnetic resonance imaging (MRI) was performed in cortical blindness cases.

Results. ***General and obstetric findings.*** The mean age of the patients was 25.5 ± 4.76 (minimum 22 to maximum 36 years). The mean gravidity was 2.5 ± 1.87, and the mean parity was 1.3±1.56. The HELLP count syndrome was determined in 9 cases (8.4%) before the 27 weeks of gestation, and in 98 cases (91.6%) after the 27 weeks. Eighty-two cases (76.6%) were diagnosed antepartum, and 25 cases (23.4%) were diagnosed within the first week postpartum. Eighty-seven patients with HELLP syndrome (81.3%) were displaying all 3 components of the syndrome, and 20 (18.7%) were partial, either one or 2 components. As far as the platelet count was concerned, 31 (28.9%) were in class one (platelet count less than 50,000 per mm^3), 39 (36.4%) in class 2 (platelet count 50,000 to less than 100,000 per mm^3), and 37(34.7%) in class 3 (platelet count 100,000 to 150,000 per mm^3). Mean values of the laboratory results were as follows: platelet count was 55,200/mm^3, aspartate transaminase 308.7 IU/L, alanine transaminase 255.4 IU/L, and lactate dehydrogenase 1711.6 IU/L. During the treatment period 4 patients (3.7%) died, 8 had hepatorenal failure, one had intracranial hemorrhage, and one had an unknown cause of either cardiopulmonary arrest or adult respiratory distress syndrome.

Ophthalmologic manifestations. Bilateral asymmetric bullous retinal detachments (BAB-RDs) were determined in 4 cases (3.7%) (**Figures 1a & 1b**). The second and fourth cases were delivered by cesarean section. The first, and third cases had been delivered at other hospitals. Approximately one week after cesarean section, 75% recovered their vision (**Figured 2a & 2b**). The third case resulted in exitus. The visual, and obstetric documentation of the BAB-RD in HELLP syndrome cases is presented in **Table 1**.

Acute cortical blindness occurred in 3 cases (2.7%). Pupillary reflexes were intact, and no retinal change was observed. The MRI for central nerve system was normal. All of the 3 cases were delivered by cesarean section. Approximately one week after cesarean section, their vision recovered completely. There was no radiologic finding in MRI images of cortical blindness cases. In **Table 2** visual, and obstetric documentation of the cortical blindness cases are shown. Mild visual disturbances with vascular changes were observed in 18 cases (16.8%). Patients complained of blurred vision. The VAs were between 0.6-1.0, and all recovered in

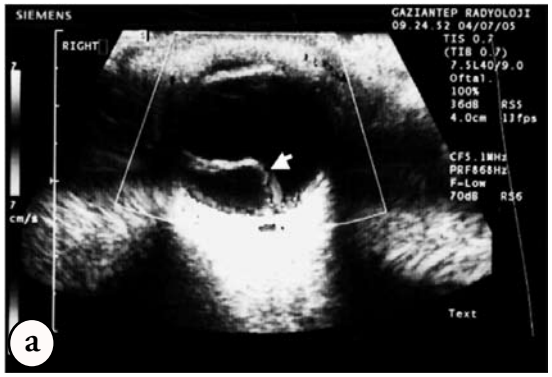

Figure 1 - Sonograh showing **a**) bilateral asymmetric bullous retinal detachments, right eye (arrow), **b**) bilateral asymmetric bullous retinal detachments, left eye (arrow).

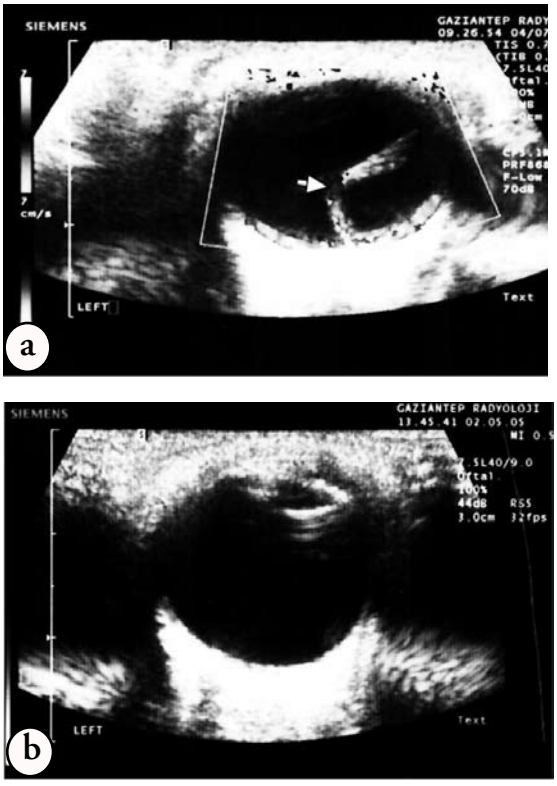

Figure 2 - Sonograph showing **a**) full recovery one month later after delivery (arrow), right eye, **b**) full recovery one month later after delivery, left eye.

Table 1 - Visual and obstetric documentation of the bilateral asymmetric bullous retinal detachments (BAB-RD) in HELLP syndrome cases.

Cases (1-4)	Age	Occurring time	Hellp classification	Baseline VA*	Recovery time	VA* after recovery
BAB-RD (1)	23	Post partum	Full HELLP Class I	†R: 0.1, L: 0.2	one week after delivery	R: 1 L:1
BAB-RD (2)	28	34 weeks of gestation (shown in B-scan US)	Full HELLP Class II	R: ‡P+P+ L: 5MFC§	8 days after delivery	R: 0.8 L: 0.9
BAB-RD (3)	35	Post partum	Full HELLP Class I	R: 1MFC L- P+P-	-	-
BAB-RD (4)	29	31 weeks of gestation	Full HELLP Class I	R: 0.1 L: 1MFC	one week after delivery	R: 0.7 L: 0.6

*VA - visual acuity, †R - right eye, L - left eye, ‡P+P+ - perception and projection of light are positive, P+P- - there is no projection of light sensation, §MFC - meters finger counting, BAB-RD - Bilateral asymmetric bullous retinal detachments, HELLP - hemolysis, elevated liver enzymes and low platelet count

one month after delivery. Retinal changes occurred with or without hypertension, including constrictions of the major arterial branches, mild venous dilatation, temporal papillary paleness, and hemorrhages on the nerve fibers. No correlation was determined between the retinal changes, and severity of the HELLP syndrome. No retinal vein occlusion, vitreous hemorrhage, cerebral sinus thrombose or high ocular pressure was observed.

Discussion. Previous reports indicated that the HELLP syndrome causes severe ophthalmologic disorders along with some other disturbances in other systems such as acute renal, and hepatic failures. Burke[8] has reported the first HELLP case with retinal detachments. Another report has documented serious retinal detachments in a patient with HELLP.[9] Our study has determined the ratio of this clinical finding as 3.7%. The restult of the present study and other studies revealed that there

is a spontaneous recovery within a few weeks in this pathologic condition of the eye without any treatment of the patients with HELLP syndrome. However, a careful eye examination should still be undertaken to avoid any further consequences in vision. Cortical blindness is another important pathological condition which has been displayed in patients with HELLP syndrome which is an uncommon and serious sign.[10-12] Our study has documented the ratio of this sign as 2.7% (3 cases). All case reports indicated through ophthalmologic examination that there were normal ophthalmoscopic findings and intact papillary light reflexes but no light perception in either eye. Even though some case reports found bilateral, cortical, subcortical occipital lobe lesions with hypodensity on CT, and hyperintensity on T2-weighted MRI[10,12] one documented normal results.[11] Likewise, our findings in the 3 cases showed normal ophthalmoscopic findings and intact papillary light reflexes. However, there was no light perception in one eye of the one patient while the other eye was P+, P-. However, the meter finger counting (MFC) results of the other 2 patients were between one and 3. Our MRI results indicate no pathologic finding. We also observed that the 3 cases recovered spontaneously after the delivery without any particular treatment. Sedrowicz[5] reported a HELLP case with blurred vision, retinal edema, and hemorrhages. The patient had recovered fully after 4 months. Wenzel and Lehnen[6] also reported a case with similar ophthalmic signs including blurred vision (right eye: 20/20, and left eye: 20/25), and a mild constriction of the lower temporal artery. This patient had also recovered fully in the first postpartum days. We also observed mild vascular changes and blurred vision. All patients recovered in one month after delivery. Overall, the findings of our study, and the literature[6] suggests no particular correlation between the retinal changes and severity of the HELLP syndrome.

Previous case reports indicated retinal vein occlusion, vitreous hemorrhage, and cerebral sinus thrombose in the patients with HELLP.[13-15] We examined 107 HELLP cases, and determined neither retinal vein occlusions, and cerebral sinus thromboses nor vitreous hemorrhages. Recently, a serious case report of bilateral bullous retinal detachment in a HELLP syndrome has been reported. Taskapili et al[16] performed argon laser photocoagulation to the peripheral localized tractional retinal detachment in the left eye, and used intravitreal triamcinolone acetonide injection to right eye due to the persistent macular elevation.

Consequently, all pregnant who complained generalized malaise, epigastric pain, headache, vomiting, and nausea in the third trimester should be evaluated with complete blood count, and liver function tests to reveal a possible underlying HELLP syndrome. In the case of HELLP syndrome, our results and literature cases stressed that ophthalmic complication may occur. Although most of the ophthalmic pathologies recover promptly after delivery, it is essential that all ophthalmologists are aware of retinal disorders of this fatal complication of pregnancy. It is important to be aware and know this entity to prevent from a possible blindness. Although we have not determined any long-term sequels, the need for further well-designed prospective studies is evident in order to understand this potentially catastrophic complication of pregnancy.

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