

**Association between the Quantitative  
Assessment of Schistocytes in Peripheral Blood  
Smear and Prognosis of Patient Initially  
Diagnosed as HELLP Syndrome**

**Thesis**

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**Presented by  
Shimaa Bakry Mohammed**

*M. B., B. Ch.2009*

*Faculty of Medicine, Ain Shams University*

*Work at Abu Sewair medical administration*

**Under the supervision of  
Ass. Prof. Ahmed Hamdy Naguib**

*Assistant Professor of Obstetrics and Gynecology*

*Faculty of Medicine, Ain Shams University*

**Lecturer. Ayman Abd El-Kader Mohamed**

*Lecturer of Obstetrics and Gynecology*

*Faculty of Medicine, Ain Shams University*

**Lecturer. Rasha Abd El-Rahman El-Gamal**

*Lecturer of Clinical and Chemical Pathology*

*Faculty of Medicine, Ain Shams University*

**Faculty of Medicine  
Ain Shams University**

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تحت اشراف  
أ.م.د / احمد حمدى نجيب

أستاذ مساعد التوليد وأمراض النساء  
كلية الطب – جامعة عين شمس

د/ ايمن عبد القادر محمد

مدرس التوليد وأمراض النساء  
كلية الطب – جامعة عين شمس

د/رشا عبد الرحمن الجمل

مدرس الباثولوجيه الاكلينيكيه  
كلية الطب – جامعة عين شمس  
كلية الطب  
جامعة عين شمس

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## List of Abbreviations

<b>AFLP</b>	: Acute fatty liver of pregnancy
<b>ACE</b>	: Angiotensin converting enzyme
<b>APS</b>	: Antiphospholipid syndrome
<b>AST</b>	: Aspartate aminotransferase
<b>CNS</b>	: Central nervaus system
<b>COCp</b>	: Compiend contraceptive pills
<b>CBC</b>	: Complet blood count
<b>CT</b>	: Computed tomography
<b>DIC</b>	: Disseminated intravascular coagulopathy
<b>FFP</b>	: Fresh frozen plasma
<b>GP</b>	: Glycoprotien
<b>HELLP</b>	: Hemolysis,Elevated liver enzyme,Low platlets
<b>HUS</b>	: Hemolytic uremic syndrome
<b>HDP</b>	: Hypertension diseases with pregnancy
<b>ITP</b>	: Immune thrombocytopenia
<b>IgG</b>	: Immunoglobulin G
<b>INR</b>	: International normalized ratio
<b>LDH</b>	: Lactate dehydrogenase
<b>LCHAD</b>	: Long chain 3hydroxy acyl coA dehydrogenase
<b>MAHA</b>	: Microangiopathic hemolytic anemia
<b>PEX</b>	: Plasma exchange
<b>PT</b>	: Prothrombin time
<b>PTT</b>	: activated partial thromboplastin
<b>RBCS</b>	: Red blood cells

<b>TMA</b>	:	Thrombotic microangiopathic anemia
<b>TTP</b>	:	Thrombotic thrombocytopenic purpura
<b>UL</b>	:	Unusually large
<b>VWF</b>	:	Von willebrand factor
<b>ADAMTS-13</b>	:	Von willebrand factor -cleaving protease
<b>S/D FFP</b>	:	solvent/detergent-treated fresh frozen plasma

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## **Introduction**

HELLP syndrome probably represents a severe form of preeclampsia, but the relationships between the two disorders remain controversial. As many as 15 to 20 percent of patients with HELLP syndrome do not have antecedent hypertension or proteinuria, leading some authorities to believe that HELLP syndrome is a separate disorder from preeclampsia (*Reubinoff–Schenker ., 1991*).

The most common symptom is abdominal pain and tenderness in the midepigastrium, right upper quadrant, or below the sternum (*Sibai – Ramadan ., 1993*).

Many patients also have nausea, vomiting, and malaise, which may be mistaken for a nonspecific viral illness or viral hepatitis, particularly if the serum aspartate aminotransferase and lactate dehydrogenase are markedly elevated (*Catanzarite ., et al 1995*).

Less common signs and symptoms include headache, visual changes, jaundice, and ascites. Mistaking abdominal pain, nausea, vomiting, and malaise for viral illness is a common pitfall that has resulted in maternal death or severe morbidity (*Isler ., et al 1999*).

Hypertension (blood pressure  $\geq 140/90$  mmHg) and proteinuria are present in approximately 85 percent of cases, but it is important to remember that either or both may be absent in women with otherwise severe HELLP syndrome (*Sibai, 2004*).

Signs and symptoms typically develop between 28 and 36 weeks of gestation, but second trimester or postpartum onset is also common. In an illustrative series of 437 women who had 442 pregnancies complicated by the HELLP syndrome, 70 percent occurred prior to delivery. Of these patients, approximately 80 percent were diagnosed prior to 37 weeks of gestation and fewer than 3 percent developed the disease between 17 and 20 weeks of gestation (*Sibai ., et al 1993*).

Serious maternal morbidity may be present at initial presentation or develop shortly thereafter. This includes disseminated intravascular coagulation, abruptio placentae, acute renal failure, pulmonary edema, subcapsular or intraparenchymal liver hematoma, and retinal detachment, bleeding related to thrombocytopenia is an unusual presentation (*Sibai ., et al 1993*).

**Outcome and prognosis** of HELLP syndrome is associated with a variety of maternal morbidities, which can rarely result in a fatal outcome. The risk of serious morbidity correlates with increasing severity of maternal symptoms and laboratory abnormalities (*Martin ., et al 2006*).

The majority of patients will show evidence of resolution of the disease process within 48 hours after delivery(*ACOG 2004*)

**Differential diagnosis** HELLP syndrome may occasionally be confused with other diseases complicating pregnancy: acute fatty liver of pregnancy, gastroenteritis, hepatitis, appendicitis, gallbladder disease, immune thrombocytopenia, lupus flare, antiphospholipid syndrome, hemolytic-uremic syndrome, thrombotic thrombocytopenic purpura, and nonalcoholic fatty liver disease (*Page- Girling ., 2011*).

Thrombotic thrombocytopenic purpura and hemolytic uremic syndrome are systemic disorders characterized by endothelial injury and the formation of small vessel platelet-rich thrombi. The resulting thrombotic microangiopathy produces microangiopathic hemolytic anemia and thrombocytopenia; presenting features may