

## THE CLINICAL MANIFESTATION OF HEMORRHAGES IN ECLAMPSIA.<sup>1</sup>

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HEMORRHAGIC manifestations in eclampsia are fortunately very rare, for they are evidenced only in those cases suffering from an extreme degree of toxicity—so extreme, indeed, that death is usually the outcome. Why, of two cases of eclampsia, of apparently equal intensity, the one should develop this hemorrhagic condition and the other should not, we cannot as yet say, for in both cases the liver may be apparently involved to an equal degree.

The same manifestations may likewise occur in severe cases of toxæmia of both pregnancy and the puerperium; but of these it is not my purpose to speak at this time.

**FREQUENCY.** After an extensive review of the literature on eclampsia, no accurate conclusion has been reached by the writer as to the frequency of this group of cases. It is so rare, however, that only a few isolated cases have so far been reported, and that not one of the usual text-books on obstetrics speaks of it as even existing. Newell, reviewing 78 cases of eclampsia under his care up to 1899, does not mention a single case of this type.

In studying the series of eclamptics at the Sloane Maternity Hospital (up to August 15, 1904), we find that in the last 12,000 deliveries there were 152 cases of eclampsia. Of these 152 cases, apparently only 7 (*i. e.*, 4.6 per cent., approximately) gave clinical evidence of hemorrhages. Of these 7 cases, 5 occurred during the past two years.

Owing to the unusual character of this type of eclampsia, we beg leave to present to you the following cases taken from the series just mentioned, and in so doing we shall endeavor to omit all details not pertinent to the question in hand:

**CASE I.** (History No. 14,290).—The patient, a colored I-gravida, aged twenty-six years, was admitted to the hospital in an unconscious state, with marked albuminuria. The onset of the disease was a sudden one. Soon after admission she delivered herself of a small, premature infant of about six months. One hour after labor she had a severe convulsion. Despite the usual active medical treatment, there were twelve more convulsions during the next twelve hours. Temperature, 100°; pulse 84 to 100.

**Uranalysis.** Total quantity, 13½ ounces; specific gravity, 1044; reaction acid; 90 per cent. albumin by boiling and centrifuge; urea, 160 + grains; many casts of all of the common varieties.

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*First Day Post-partum.* Marked general improvement during night. Patient at times conscious, taking some nourishment. During the day she was quiet; toward evening, however, became restless. The abdomen became distended and tender. There was some jaundice of the scleræ. Temperature, 100.8° to 99.8°; pulse, 130 to 88.

*Uranalysis.* Total quantity, 8 ounces; specific gravity, 1040; acid; 50 per cent. albumin, centrifuge; urea, 96+ grains in twenty-four hours.

*Second Day Post-partum.* No convulsions; delirious at times; severe abdominal pain and marked abdominal distention. Great tenderness over the liver, but the latter did not seem changed in size.

Toward the middle of the day the patient began to vomit coffee-ground material—this vomiting soon becoming almost continuous. Despite all efforts, death occurred in the early evening. Temperature, 97°; pulse, 90 to 100.

*Uranalysis.* Total quantity, 11 ounces; 5 per cent. albumin, centrifuge; urea, 1.9 grain to 1 ounce (total quantity of urea, 20.9 grains); many hyaline and granular casts. Lochia normal throughout.

CASE II. (History No. 14,310).—Patient, a white I-gravida, aged nineteen years, six months along; was brought to the hospital in a semicomatose condition, with the history of having had several convulsions. The previous renal history was negative.

On admission she was found to be markedly œdematous and markedly toxic. An accouchement forcé was performed within a few hours.

*Uranalysis on Admission.* Acid; specific gravity, 1030; 60 per cent. albumin, centrifuge; urea, 6.2 grains to the ounce; many casts. Temperature, 101°; pulse, 120.

*First Day Post-partum.* Semicomatose; no convulsions; general condition much better apparently. Temperature, 99°; pulse, 90 to 70.

*Uranalysis.* Total quantity, 10+ ounces; specific gravity, 1040; acid; 20 per cent. of albumin by centrifuge; 88+ grains of urea in twenty-four hours; many casts.

*Second Day Post-partum.* Rational at times, but restless; pain in abdomen and some distention; milk and water well taken. Temperature, 99.4° to 100°; pulse, 90 to 120.

*Uranalysis.* Total quantity, 32 ounces; specific gravity, 1010; acid; 5 per cent. of albumin by centrifuge; urea, 95 grains in twenty-four hours; many casts.

*Third Day Post-partum.* Conscious, but unreasonable; more abdominal distention; increased pain and tenderness, especially over the liver; jaundice; vomited 12 ounces of coffee-ground material. Temperature, 100.4° to 99.4°; pulse, 90 to 120.

*Uranalysis.* Total quantity, 50 ounces; specific gravity, 1012; acid; trace of albumin; urea, 70 + grains in twenty-four hours; few casts.

*Fourth Day Post-partum.* Severe headache; frequent vomiting throughout the day of coffee-ground material in considerable quantities. Temperature, 98°; pulse, 100 to 120.

*Uranalysis.* Total quantity, 32 ounces; specific gravity, 1034; 5 per cent. of albumin, centrifuge; urea, 265 grains in twenty-four hours; more casts.

*Fifth Day Post-partum.* More vomiting of coffee-ground material during night. Gradual improvement during day. Less pain and less abdominal distention. Temperature, 98° to 99.8°; pulse, 124 to 100.

*Uranalysis.* Total quantity, 22 ounces; specific gravity, 1034; 5 per cent. of albumin, centrifuge; urea, 150 grains in twenty-four hours; some casts. From this time on gradual, steady improvement. Discharged on the twenty-second day. Lochia normal throughout.

CASE III. (History No. 14,699).—Patient, a white I-gravida, aged thirty-two years, about eight and a half months along; was admitted to the hospital with severe albuminuria. As her symptoms became steadily worse under medical treatment, labor was induced six days later. An accouchement forcé was performed after slight preliminary dilatation of the cervix with a Voorhees bag. During labor patient had two convulsions; then became quiet and rational. During the days of the medical treatment alone, the albumin increased from 4 per cent. to 8 per cent. by centrifuge; and the urea changed from 5 grains to the ounce to 2 grains to the ounce. The total quantity of urine ranged from 35 to 26 ounces per day.

*First Day Post-partum.* Restless, but no convulsions; general condition very poor. Lower part of abdomen very painful. Temperature, 97.4° to 99°; pulse, 140 to 120; respirations, 26 to 36.

*Uranalysis.* Total quantity, 18 ounces; specific gravity, 1030; acid; 3 per cent. albumin, centrifuge; urea, 145 grains in twenty-four hours; no casts.

*Second Day Post-partum.* Restless; nauseated; abdomen distended and painful; jaundiced; vomited throughout the day small amounts of coffee-ground material. Toward evening, marked tenderness over liver and stomach. Temperature, 98° to 99.6°; pulse, 120.

*Uranalysis.* Total quantity, 43 ounces; specific gravity, 1020; acid; 3 per cent. albumin, centrifuge; urea, 495 grains in twenty-four hours; many casts.

*Third Day Post-partum.* Vomiting of coffee-ground material continues; apathetic; some slight enlargement of the liver. Temperature, 98.4° to 99.4°; pulse, 120 to 140.

*Uranalysis.* Total quantity, 26 ounces; specific gravity, 1020; acid; 1 per cent. albumin, centrifuge; urea, 255 grains in twenty-four hours; no casts.

*Fourth Day Post-partum.* General condition much worse; very weak; vomited large amounts of old blood. No response to stimulation. Died 5 A.M. Temperature had ranged between 98.8° to 100.4°; pulse between 140 and 120. Lochia normal throughout.

CASE IV. (History No. 14,916).—Patient, a white I-gravida, aged twenty-five years, five months along; was admitted in an unconscious state, having had several convulsions. She was delivered ten hours later by an accouchement forcé (the cervix required preliminary softening). No convulsions during labor. General condition fair.

Temperature, 101° to 102.2°; pulse, 110 to 138. Leukocytes, 62,000.

*Uranalysis.* Total quantity, 8 ounces; acid; solid with albumin; urea, 70 grains; many casts.

*First Day Post-partum.* Color poor; jaundiced; restless; several convulsions; abdomen distended and painful. Leukocytes, 88,600. Marked apparent improvement toward evening. Temperature, 102.8° to 98°; pulse, 140 to 120.

*Uranalysis.* Total quantity, 18 ounces; specific gravity, 1022; 3 per cent. albumin, centrifuge; urea, 155 grains in twenty-four hours; many casts.

*Second Day Post-partum.* General condition suddenly grew worse; two short convulsions; abdomen markedly distended and painful. Hepatic region tender; early in the day vomited blood-streaked fluid; stools became tarry. In the early afternoon vomited bright-red blood and died shortly afterward. Temperature, 101.6° to 98°; pulse, 140 to 150; leukocytes, 36,200 (marked drop). Lochia normal throughout.

CASE V. (History No. 8925).—Patient, II-gravida, aged twenty-four years, six and a half months along; walked into the hospital complaining of headache and dizziness. She had been sick for two days, and had had two convulsions at her home on the day of admission. She looked badly infected.

*Uranalysis on Admission.* Scant; specific gravity, 1032; boiled solid with albumin; many casts. Labor was at once induced. She was delivered on the following day. Temperature, 99°; pulse, 110.

*First Day Post-partum.* No convulsions, but severe headache. Toward evening some abdominal pain and distention; vomited some coffee-ground material.

*Uranalysis.* Total quantity, 47 ounces; acid; 50 per cent. albumin by boiling; many casts. Temperature, 98°; pulse, 100 to 80.

*Second Day Post-partum.* Restless, noisy; one severe convulsion; markedly jaundiced; vomited in the course of the day this same coffee-ground material. Hemorrhage into skin near vulva. Temperature, 98.8° to 103.2°; pulse, 100 to 80.

*Uranalysis.* Total quantity, 17 ounces; acid; specific gravity, 1018; 8 grains of albumin after boiling, by centrifuge.

*Third Day Post-partum.* Semicomatose; condition not so good; marked pain and tenderness over liver. Vomited coffee-ground material and some bright-red blood. Temperature, 98° to 99°; pulse, 80 to 94.

*Uranalysis.* Total quantity, 10 ounces; specific gravity, 1012; 8 per cent. of albumin; no casts.

*Fourth Day Post-partum.* Condition about the same, but no vomiting.

*Fifth Day Post-partum.* Still tenderness over liver; no vomiting; tarry stools.

*Uranalysis.* Total quantity, 8 ounces; 5 per cent. of albumin; specific gravity, 1086; no casts. Temperature, 98°; pulse, 84 to 90.

*Sixth Day Post-partum.* Feels somewhat better; tarry stools continue.

*Uranalysis.* About the same. Temperature, 98° to 100°; pulse, 90 to 110.

*Seventh Day Post-partum.* Very stupid and drowsy; very marked abdominal distention; frequent loose, dark, tarry stools.

*Eighth Day Post-partum.* No vomiting; stools the same.

*Ninth Day Post-partum.* Condition the same.

*Tenth Day Post-partum.* Subcutaneous ecchymoses on back and chest. Patient much weaker; deeply comatose. Temperature, 98.8°; pulse, 120.

*Uranalysis.* Total quantity, 6½ ounces; 3 per cent. of albumin; casts.

*Eleventh Day Post-partum.* Death early in the morning. Lochia normal throughout.

CASE VI. (History No. 12,780. Reported in *Medical News*, November 21, 1903).—Patient, a white I-gravida, aged twenty-two years, six and a half months along; entered the hospital with a rather severe albuminuria. She had only had symptoms for three days.

*Uranalysis.* Scant; specific gravity, 1026; 30 per cent. of albumin by boiling; many casts; urea, 5 grains to the ounce. She was placed at once on medical treatment. About three hours after admission she had a severe convulsion. An accouchement forcé was performed, which was well borne by the patient. She slept quietly most of the night. When awake, nourishment was well taken. Temperature, 99.8°; pulse, 84; respiration, 24.

*First Day Post-partum.* Severe frontal headache; moderate nausea and vomiting; restless, but no convulsions. Nourishment fairly well taken. Temperature, 99° to 97.8°; pulse, 80 to 100, of moderate tension.

*Uranalysis.* Acid; specific gravity, 1016; albumin, 5 per cent. by centrifuge; urea, 150 grains in twenty-four hours; many hyaline and granular casts; total quantity, 50 ounces.

*Second Day Post-partum.* Nauseated; vomited several times dark-brown fluid; abdomen distended, painful, and tender. Tenderness

especially marked in the right hypochondrium. Moderate jaundice; œdema of the face; expectorated bright-red blood in the evening, and complained of a severe pharyngitis. Pharynx congested. Temperature, 98.4°; pulse, 110 to 120, of high tension.

*Uranalysis.* Acid; specific gravity, 1018; albumin, 2 per cent., centrifuge; urea, 50+ grains in twenty-four hours; moderate number of hyaline, granular, and epithelial casts; total quantity, 24 ounces.

*Third Day Post-partum.* Frequent vomiting of dark-brown fluid; abdomen somewhat less distended and tender; fair result from strong catharsis; jaundice the same; many petechial spots on trunk and extremities; pharynx very painful; submucous retropharyngeal hæmatoma. Some general improvement toward evening. Temperature, 98° to 100.2°; pulse, 130 to 120, irregular at times and of moderate tension.

*Uranalysis.* Acid; albumin, 2 per cent., centrifuge; urea, 488 grains in twenty-four hours; many hyaline and granular casts; total quantity, 61 ounces.

*Fourth Day Post-partum.* No headache; less irritable and restless; pharynx the same; vomited dark-brown fluid; abdomen moderately distended and tender; no enlargement of the liver. Temperature, 100° to 98.4°; pulse, 128 to 100, of low tension.

*Uranalysis.* Acid; specific gravity, 1024; albumin, 1 per cent. by centrifuge; urea, 485 grains in twenty-four hours; casts of all varieties; total quantity, 69 ounces.

*Fifth Day Post-partum.* General condition apparently improved; pharynx improved; no vomiting; blood-stained fluid defecation. Temperature, 98.4° to 100.2°; pulse, 118 to 114.

*Sixth Day Post-partum.* Nauseated; vomited dark-red blood several times; severe epigastric pain; abdomen tender and somewhat distended; jaundice the same; no headache; restless. Temperature, 100.6° to 100°; pulse, 124 to 112; respirations, 28 to 38.

*Uranalysis.* Acid; specific gravity, 1024; albumin, 2 per cent. by centrifuge; urea, 475 grains in twenty-four hours; casts decreasing; total quantity, 53 ounces.

*Seventh Day Post-partum.* Jaundice less; pharynx no longer painful; hæmatoma decreased in size; tarry stools; general improvement toward evening. Temperature, 100.4° to 100.6°; pulse, 120 to 110. Lochia normal.

*Eighth Day Post-partum.* No headache; no restlessness; cheerful; no abdominal pain and only slight distention; vomited small amount of blood; stools normal. Slight odor to lochia. Temperature, 100.8° to 100°; pulse, 112 to 118.

*Uranalysis.* Acid; specific gravity, 1024; albumin, 1 per cent. by centrifuge; urea, 225+ grains in twenty-four hours; total quantity, 25 ounces; only few casts.

*Ninth Day Post-partum.* Marked general improvement; jaundice and petechial spots have almost disappeared; abdomen soft;

nourishment well taken. Lochia normal. Temperature, 101° to 99°; pulse, 110 to 120; respirations, 28 to 32. From this time on the patient made an uninterrupted recovery. There were no further hemorrhages. The albumin and casts gradually disappeared. The temperature, which was in part due to some slight uterine absorption, gradually dropped to the normal. The patient was discharged on October 19th in a very fair condition.

**CHIEF SYMPTOM-COMPLEX.** In analyzing critically the above cases, we find a group of symptoms that are most striking, that are quite characteristic of this type of eclampsia, and quite unlike any other form of the disease. These symptoms are:

1. *The profound toxicity.*

2. *The jaundice.* This is far more constant and more marked than in the ordinary type of case. It was present in all of our cases under discussion.

3. *The abdominal distention.* This is usually both a prominent and an early symptom, and is at times most distressing. It begins as an epigastric distention, which then gradually becomes generalized. This sign is of bad omen, and in every case of eclampsia, if it develops, we should be on the watch for hemorrhagic complications.

4. *The vomiting.* This consists of clear fluid or curdled milk; then of bile; and finally of coffee-ground material or of clear blood.

5. *The pain and tenderness over the liver.* These are often of great intensity.

6. *Hemorrhagic manifestations* other than the vomiting of blood.

**PATHOLOGY.** The chief pathological features of the cases under consideration, as well as of the severer cases of eclampsia, without the clinical manifestation of hemorrhages, are:

1. The development of multiple hemorrhagic foci in the various organs.

2. The development of thrombotic processes in many of the smaller vessels.

3. The formation of irregularly shaped areas of necrosis in the several organs of the body, especially in the liver, these necrotic areas being largely dependent upon the thrombi mentioned above. These thrombi are at times recognizable with the naked eye; more often they are not. They are not artefacts, nor are they placental-cell emboli, as they were at one time thought to be. They consist mainly of hyaline material.

*The Brain.* The brain shows macroscopically, according to Prutz, oedema in 42 per cent. of cases, hyperæmia in 30 per cent., apoplexy in 3 per cent., a normal condition in 10 per cent. of the cases; microscopically, many small areas of necrosis are to be found, depending largely upon a mild thrombosis in the smaller vessels.

*The Heart.* The myocardium shows marked parenchymatous degeneration, also many small foci of necrosis, which may be due both to the toxæmia and to prolonged use of chloroform.

*The Liver.* The liver is usually but little changed in size, and the capsule smooth. There may be found beneath it hæmatomata of varying size (4 cases have been reported that ruptured fatally into the peritoneal cavity). Both the surface of the organ, as well as its substance, are moderately icteric. We note, further, irregularly shaped red and yellow areas scattered throughout its substance and on its surface.

Microscopically, these areas are found to consist of hemorrhagic and anæmic necroses, which may or may not contain red blood cells. These necroses have a tendency to lie near the periphery of the lobules, and are now considered to be largely the result of thrombotic processes which are found in the smallest radicles of the portal vein, very occasionally in the radicles of the hepatic artery.

The necrosis is essentially a coagulation necrosis, accompanied by an unusually large amount of fibrin.

There may be definite hemorrhage into the substance of the liver, apart from the hemorrhagic necroses.

Such is the common picture of the liver in fatal cases of eclampsia. Bouffe de St. Blaise demonstrated these lesions in 42 consecutive cases; Schmorl found them in 71 out of 73 autopsies. These results have been attested to by many other observers, as well as by myself. In rare instances we find the typical picture of "acute yellow atrophy," viz., the liver is much reduced in size; the capsule wrinkled; the degeneration most intense, and especially marked in the mid-zonal areas.

*The Kidneys.* These show most frequently an acute nephritis, with marked necrosis of the renal epithelium. This acute process is occasionally grafted upon a chronic one.

Prutz found renal changes in all but 7 out of 368 cases. The frequency of renal involvement was attested to by Schmorl, Lubarsch, and others.

Despite these findings, Prutz's conclusions are stated as follows: "Notwithstanding the frequency of renal changes, we are not justified in the majority of cases in considering them as the anatomical substratum of eclampsia, for in many instances they are too insignificant."

Bouffe de St. Blaise states that in many cases the kidneys show almost a normal condition, while Winkler, Knapp, Pels Leusden believe the renal changes to be the most important.

*The Ureters.* These were found by Prutz to be dilated in 38 out of 500 autopsies.

*The Stomach and Intestines.* These are found to contain more or less free blood; there may be actual erosions of the mucous membrane or merely punctate hemorrhages, with or without necrotic areas. In 2 cases reported, sudden death occurred from hemorrhage due to an actual ulceration of the stomach.



*The Mesentery.* This contains many punctate hemorrhages, with some thromboses in the finer capillaries.

*The Spleen.* The spleen is usually not enlarged or only slightly.

*The Blood.* The blood shows a leukocytosis in the majority of cases; little or no change in the red blood cells; a lessened alkalinity; no change in the toxicity; a normal molecular concentration. The chemistry is still so unsettled that no consideration of it will be made at this time.

*The Urine.* The urine shows an early decrease in quantity; a high specific gravity; usually a decrease in the urea; the presence, in most cases, of large amounts of albumin and large numbers of casts; but little change in the molecular concentration. Leucin and tyrosin are occasionally present.

From the pathological anatomy, then, we find that although the kidneys show changes in a large percentage of cases, still these changes do not seem to be so uniformly severe nor so uniformly present as the changes in the liver. Further, it seems to the writer that the disease called eclampsia presents a fairly characteristic pathological picture differing, on the one hand, with acute atrophy of the liver, and, on the other, with the usual acute degenerations. We do not believe that we should speak of eclampsia as being either primarily renal or primarily hepatic in origin; but that we should regard the lesions in both liver and kidneys as the result of and not as the cause of a toxæmia, the true nature of which is not as yet known, but a toxæmia in which undoubtedly both mother and foetus play a part.

**PROGNOSIS.** The prognosis of the type of case under discussion is a very poor one. Five of our 7 cases died—*i. e.*, a mortality of 70+ per cent., as against 17+ per cent. in the general series of eclamptics during the past four years at the Sloane Maternity Hospital.

**TREATMENT.** 1. Sedatives; emptying the uterus; diuresis, etc.

2. Suprarenal extract and calcium chloride in large doses, preferably given per rectum.

**NOTE.**—I wish to express my thanks to Dr. Edwin B. Cragin for granting me the use of the material in the wards of the Sloane Maternity Hospital.

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