Toxemia of Pregnancy in a Teenage Adopted Girl: A Case Report

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ABSTRACT

A 13-year-old adopted girl, 6 months pregnant, was presented with altered consciousness and bleeding from the vagina. Based on the signs and symptoms of edema, severe hypertension and heavy proteinuria, accompanied by the abdominal ultrasound results, she was diagnosed with severe pre-eclampsia /eclampsia complicated by an abruption of the placenta and a dead fetus in utero. These serious conditions resulted in acute renal failure due to both pre-renal and renal causes. With proper management of hypertension and fluid therapy, the renal function returned to normal. Neurological manifestation was transient but complete recovery through psychological testing was in doubt. A multidisciplinary team, including psychiatrist, pediatrician, social worker and legal consultant, was established to address the issue of child abuse and neglect.

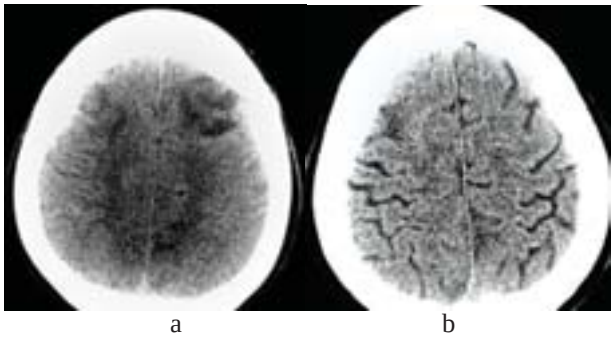
Keywords: Pre-eclampsia; Teenage pregnancy; Sexual abuse; Posterior leukoencephalopathy; Pre-eclampsia nephropathy

Even though adoption has always been a superior method of assuring survival for children whose parents are unwilling or unable to care for them, Adoption can profoundly affect child development. Many reports from western countries have shown adoptees with serious behavior problems, and at a higher rate than that of non-adopted children.[1] In an improper adoptive family, malpractice may lead to violation and abuse of a child's future. The impact of child abuse and neglect often causes physical, psychological, behavioral, and societal problems. In the case of sexual abuse, secrecy and intense feelings of shame may prevent children, and adults aware of the abuse, from seeking help. At Siriraj Hospital, 101 new cases of child abuse or neglect were presented to the Section of Child Psychiatry, Department of Pediatrics, during 2001-2004. We are reporting a case of an adopted child who was sexually abused and subsequently became pregnant with serious complications.

CASE REPORT

A 13-year-old Thai girl was brought to the emergency unit due to alteration of consciousness for six hours prior to arrival. She was six months pregnant and had no history of antenatal care. She had not had significant medical problems in the past. She was an adopted child living in rather cramped conditions with her foster parents and relatives. At school, she previously performed well academically until her status as an adopted child was disclosed. In addition to her subsequent poor performance in school, she behaved differently at home. She was often left to stay with her lesbian teacher who later introduced her to a middle-aged man. who had sexual relationship with her secretly over a year. A physical exam at the ER revealed blood pressure at 140/100 mmHg, a temperature of 38.3°C, and pitting edema of all extremities. The patient was drowsy with a coma scale of $E_4V_3M_6$. There were no focal neurological signs and a fundoscopic exam was normal. The measured fundal height corresponded to 6 months of gestation. A pelvic exam revealed blood in the vagina and a fully dilated cervix. A urinalysis showed significant proteinuria. An abdominal ultrasound showed evidence of abruption of the placenta and no fetal heart beat. Magnesium sulfate, a total dose of 14 grams, was administered intravenously, and subsequently hypertension was under control. The patient passed a dead fetus of 1,860 grams and a placenta of 540 grams with an estimated blood loss of 200 ml. The amniotic fluid was not cloudy and there was no foul smell.

At postpartum, the patient's poor mental status remained unresolved. The coma scale was $E_3V_1M_4$. Blood pressure was 95/60 mmHg. Her height was 148 cm (50^{th}centile) and weight 57.7 kg. A repeat neurological exam revealed muscle power grade I of the right and grade II-III of the left extremities. Deep tendon reflexes were absent on the right and 1+ on the left extremities. The pupillary response was normal. A fundoscopic exam was normal and there was no eye deviation. An emergency computed tomography (CT) was performed without contrast enhancement due to elevated serum creatinine (2.2 mg/dl). It showed mild generalized brain swelling with low-density area in the frontal and occipital lobes (Fig 1) The patient was admitted to the intensive care unit with 4+ proteinuria on dipstick. The ratio BUN:creatinine was 9.5:1 (mg/mg). The WBC was 24,950/mm^3 with 85% neutrophils. Hemoglobin and platelets were initially 14.7 g/dl and 289,000/$mm.^3$ and later dropped to 6.9 g/dl and 152,000/$mm,^3$ respectively. Schistocytes and spherocytes were found on a peripheral blood smear and Coombs' test



a b

Fig 1. Hypodensity lesions in frontal and occipital lobes shown in initial CT without contrast (a) compared to (b), the disapperance of the lesions in a repeated CT with contrast enhancement.

was negative. D-Dimer was elevated at 1,300 ug/l (normal <300), as was the fibrinogen level at 564.6 mg/dl (normal range, 200-400). The prothrombin time and activated partial thromboplastin time were normal. Liver function tests were normal except for a slightly increased AST. The uric acid level was elevated to 11.4 mg/dl.

Further laboratory investigation was performed to rule out conditions predisposing to thromboembolism. Antithrombin III and protein C activities were normal. Protein S activity had decreased to 53% (normal range 60-125). Screening laboratory results for autoimmune diseases [serum antinuclear antibody, anticardiolipin antibody, complement C3] were normal. An echocardiography did not show any evidence of vegetation or structural abnormalities. Renal biopsy results demonstrated glomerular endothelial cell swelling and widening of lamina rara interna with partial mesangial interposition (Fig 2).

The hypertension resumed within a few hours postpartum and was managed with hydralazine and nifedipine. A combination of cefotaxime and metronidazole was intravenously administered. With appropriate fluid and electrolyte management and good control of hypertension, her mental status and muscle strength became nearly normal in 3-4 days. Spontaneous diuresis appeared in five days and serum creatinine returned to normal on Day 10. Proteinuria on dipstick was negative in 1-2 week. CT on Day 18 did not show hypodensity lesions as in previous films but it demonstrated evidence of cerebritis in the left temporal lobe (Fig 3). A total of three weeks of IV antibiotics was completed. Child psychiatrists and forensic

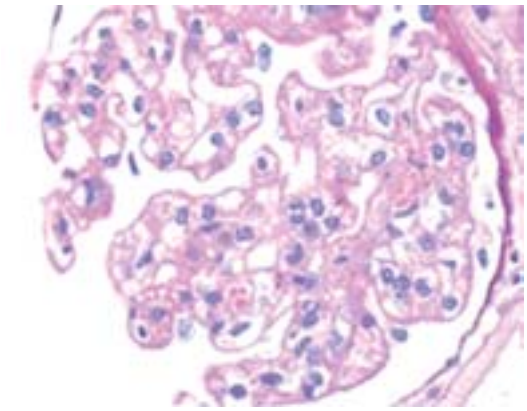


Fig 2. "glomerural endotheliosis" characterized by swelling and vacuolation of the cytoplasm of endothelial cells.

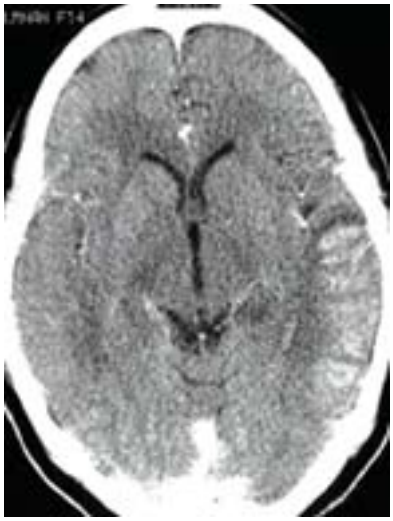


Fig 3. Enhanced lesion compatible with cetebritis in the left temporal lobe in a repeated CT with contrast.

experts were consulted on the issue of sexual abuse. An IQ test (WISC III) was performed in 3-4 months, and her IQ score was 62. Her visual-motor perception by Bender Gestalt test and academic skill by Whole Range Achievement Test were impaired.

DISCUSSION

In approaching a teenage patient in the 2nd stage of labor with hypertension and fever without prior antenatal history, several different diagnoses should be considered. This patient also had vaginal bleeding and an alteration of consciousness. The most prevalent condition found in a pregnant adolescent with hypertension is pre-eclampsia/eclampsia (PEC/EC) on top of an underlying disease which could be found in a young females such as autoimmune disease, renal disease or diabetes mellitus[2] even though the patient did not previously have any suggestive symptoms before pregnancy. In addition to edema, severe hypertension, hemoconcentration and heavy proteinuria, azotemia could also be found in PEC/EC[3] as it was in our patient. Alteration of consciousness and abnormal bleeding can be found in severe cases. The condition is also prevalent in young mothers. Emergency management of severe PEC/EC was given to the patient in order to control and prevent convulsion using magnesium sulfate, control her blood pressure by antihypertensive drugs and terminate the pregnancy.

In severe cases, fetal death occurs as a result of severe placental infarcts, a very small placenta or an abruptio placenta.[4] Our patient's, PEC/EC was likely complicated with abruptio placenta which is mostly associated with high blood pressure, vaginal bleeding and rapid labor progression. These also can cause fetal death. In abruptio placenta, several complications, especially coagulopathy and deteriorating renal function, should be noted. In general, the welfare of the fetus is also highly important, but it was not applicable in our case.

Since neither severe PEC/EC nor abruptio placenta can explain the fever, some other conditions should be considered. Autoimmune disease should be suspected in

our febrile patient with severe PEC/EC and dead fetus despite no suggestive history of autoimmune disease. Leukocytosis with predominant PMN in our patient indicated possible infection. Prolonged premature rupture of the amniotic fluid membrane could not be excluded. Since it was probably an unwanted pregnancy, another likely diagnosis was an attempted termination of pregnancy resulting in chorioamnionitis even though no other supportive evidence such as foul-smelling amniotic fluid was found.

Unexpectedly, our patient's mental status did not improve postpartum. Infectious causes such as encephalitis was suspected. Even though altered sensorium is common in a patient with eclampsia, it should also be distinguished from other simultaneous conditions including stroke and cerebral venous thrombosis. As for the laboratory result, hemostatic changes as seen in our patient are commonly found in PEC/EC. Upregulation of the coagulation system in normal pregnancy, which is further augmented in PEC/EC, facilitates thrombophilia conditions in the patient. Furthermore, our patient developed microangiopathic hemolytic anemia which is rarely seen even in very severe PEC/EC. Combined with a decreased platelet count, thrombotic thrombocytopenic purpura could not be excluded.[5] It is of paramount importance to exclude these conditions, particularly in the case of ischemic stroke from any causes. Mild to moderate hypertension should not be treated, In contrast, treatment of hypertension in patients without these conditions is essential before it progresses to permanent brain injury. Unfortunately, contrast enhancement was unable to be performed with the initial CT. However, a repeat CT did not demonstrate the localized hypodenses which appeared initially. It would indicate edema rather than infarction or abscess. With rapid reversal of our patient's neurological condition, the encephalopathy may result from a rapid rise in blood pressure leading to brain edema, mainly the vasogenic type. This condition has been recently recognized in terms of "posterior leukoencephalopathy syndrome" of which brain lesions predominate in the white matter in the posterior parietal and occipital lobes. A majority of patients recover completely after appropriate treatment.[6] However, the psychological test results in our patient at four months showed mild mental retardation which seriously affected academic performance.

Glomerular changes, as seen in the biopsy result are recognized as "glomerular endotheliosis" which is typically seen in PEC/EC. In addition, deposition of a mesangial matrix in the area between the basement membrane and the endothelium, called "interposition," could be found.[7] Although the BUN:creatinine ratio in our patient indicated parenchymal renal failure partly from glomerular morphologic changes, a fall in the glomerular filtration rate in PEC/EC may have been partly caused by a decrease in renal blood flow (in turn caused by vasoconstriction and plasma volume loss) as well as impaired renal prostacycline or nitric oxide production. Therefore, appropriate fluid management was necessary to prevent serious renal damage such as cortical necrosis. Recovery from renal failure should be anticipated over 5-7 days in most women following their delivery. Blood pressure should have returned to normal within three months. Urinalysis and urine microscopy should be normal, certainly by twelve months. If not, other primary underlying condition should be explored.[8]

A multidimensional assessment approach was undergone by the multidisciplinary team, including a psychiatrist, pediatrician, social worker and legal consultant from the Center for the Protection of Children's Rights Foundation. The assessment processes required interviews and mental status examinations of the patient, parents and relatives, psychological tests and home visits. Our further assessment surprisingly revealed that the teacher and rapist at a young age were adopted children living in the same family. It was doubtful whether the teacher had a sexual relationship with the patient. The teacher seemingly tried to keep her away from a boy with the help of the rapist. After the decision of the judge, the rapist was jailed. The teacher was kept as a witness because the patient did not blame the teacher. Placing the patient in the Center for the Protection of Children's Rights Foundation home was important during the period of parental education and support to stop child abuse and neglect from happening again. In Thailand, the Penal Code, Section 277[9], classifies rape with a girl as follows:

"Whoever has sexual intercourse with a girl not yet over fifteen years of age, with or without her consent, shall be punished with imprisonment of four to twenty years and a fine of eight thousand to forty thousand baht. If the offence, according to the first paragraph, is committed to a girl not yet over thirteen years of age, the offender shall be punished with imprisonment of seven to twenty years and fine of fourteen thousand to forty thousand baht, or imprisonment. for life..... ." Accordingly, the elements of the crime are: (1) having a penile vaginal intercourse: (2) with a girl who is not older than fifteen years of age according to the first paragraph or not older than thirteen years of age according to the second paragraph of the Penal Code, Section 277. In pregnant cases such as our patient, the evidence of sexual assault may be unclear. It was necessary to prove the gestational age corresponding to the time of the alleged sexual assault.[10,11] Cord blood collection for DNA determination is a crucial method to prove the paternity between the fetus and the suspect. In case of a dead fetus, an autopsy is required as well as cord blood collection. The femur bone of the dead fetus was also examined for DNA.

The legal responsibility of the accused can be divided into two categories: (1) there is criminal responsibility according to the first paragraph of the Penal Code, Section 277 or the second paragraph of the Penal Code, Section 277, if the victim is not older than fifteen years of age. From the history, the suspected and the victim had first sexual intercourse when the age of the victim was more than 13 years old and at the time of fertilization the victim was about 13 years 5 months and 21 days of age which less than 15 years, but older than 13 years of age. So we must apply the first paragraph of the Penal Code, Section 277 to the accused. The initiation of criminal proceeding does not depend on whether the legal representative has notified the police investigation about the crime or not because the offence according to this Section is not compoundable offence. There is also civil responsibility according to the Civil Code, Section 420.[12] Our patient could claim compensation by processing civil litigation to the court within the prescription according to the second paragraph of Civil Code, Section 448.[13]

CONCLUSION

The effects of child abuse and neglect vary, depending on the circumstances of the abuse or neglect, personal characteristics of the child, and the child's environment. Consequences may be mild or severe. They may disappear after a short period or last a lifetime and may affect the child physically, psychologically, behaviorally, or in some combination of all three ways. The effects of child abuse can be increased or decreased by key relationships in the child's life. More than anyone else (including therapists), parents and caregivers can help children recover from abuse and its effects.

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บทคัดย่อ

ภาวะครรภ์เป็นพิษในเด็กหญิงวัยรุ่นที่ถูกรับไว้เป็นบุตรบุญธรรม : รายงานผู้ป่วย 1 ราย

อนิรุธ ภัทรากาญจน์ พ.บ.*, พรพิมล เรืองวุฒิเลิศ พ.บ., ชาตรี วิฑูรชาติ พ.บ.*, พิมพ์ประไพ เสนีวงศ์ ณ อยุธยา พ.บ.*****

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เด็กหญิงกำพร้าอายุ 13 ปี พักอาศัยอยู่กับพ่อแม่บุญธรรม ถูกนำตัวส่งโรงพยาบาลภายหลังจากถูกพบว่าหมดสติภายในบ้าน ร่วมกับมีเลือดออกทางช่องคลอด ผู้ป่วยมีประวัติตั้งครรภ์มาประมาณ 6 เดือน จากการตรวจร่างกายพบว่า บวมทั่วตัว ความดันโลหิตสูงในระดับรุนแรง ตรวจพบโปรตีนจำนวนมากในปัสสาวะ ได้รับการวินิจฉัยว่าเป็น severe pre-eclampsia/eclampsia ผลการตรวจอัลตราซาวด์ช่องท้องเข้าได้กับ abruptio placenta และพบว่ามีทารกตายในครรภ์ ในขณะเดียวกันก็มีภาวะแทรกซ้อนต่างๆ เกิดขึ้น ได้แก่ ไตวายเฉียบพลัน และอาการทางระบบประสาท ซึ่งเป็นผลจากความดันโลหิตสูงที่รุนแรง ภายหลังจากการควบคุมความดันโลหิตรวมทั้งการให้สารน้ำและการแก้ไขภาวะขาดสมดุลของเกลือแร่อย่างถูกวิธี หน้าที่ไตของผู้ป่วยสามารถกลับคืนสู่ปกติ อย่างไรตาม ถึงแม้โดยรวมผู้ป่วยจะมีอาการที่ดีขึ้น แต่ผลการตรวจ psychological test พบว่ายังคงมีความผิดปกติทางสมองเหลืออยู่ ผู้ป่วยรายนี้เป็นตัวอย่างหนึ่งของปัญหาการทำทารุณกรรมในเด็กที่มีความจำเป็นต้องได้รับการดูแลอย่างต่อเนื่องโดยการทำงานร่วมกันของจิตแพทย์,กุมารแพทย์, นักสังคมสงเคราะห์ และแพทย์นิติเวช