**Cerebral venous thrombosis secondary to ovarian hyperstimulation syndrome**

We report a case of a woman who underwent in-vitro fertilisation embryo transfer treatment for infertility and developed an acute stroke (left hemiparesis and headache). The stroke was caused by cerebral venous thrombosis due to ovarian hyperstimulation syndrome. We review the current background about this uncommon disorder.

**Introduction**

Ovarian hyperstimulation syndrome (OHSS) is a rare complication of ovarian stimulation. Overproduction of ovarian hormones and vasoactive substances causes an increase in capillary membrane permeability and acute third-space fluid loss; consequential intravascular volume depletion and haemoconcentration can lead to thromboembolism and death. We describe a woman who developed cerebral venous thrombosis as the presenting feature of OHSS.

**Case report**

A 42-year-old right-handed woman presented with headache and left-sided weakness of acute onset. She was a non-smoker and had been well before the admission, with no risk factors for stroke and no history of polycystic ovary syndrome. She had been undergoing in-vitro fertilisation (IVF) embryo transfer treatment for secondary infertility. Neurological examination showed intact consciousness with normal vision, sensation and language function, and a left-sided hemiparesis. Plain cranial computed tomography showed an infarct in the right frontal region, and magnetic resonance imaging performed on the next day demonstrated the right frontal infarct as well as thrombosis of the superior sagittal sinus and right cortical veins (Figs 1 and 2). In view of the diagnosis of cerebral venous thrombosis, she was treated with low-molecular-weight heparin, nadroparin, subcutaneously twice daily. By this time we had obtained details of the IVF treatment protocol from the gynaecologist. The patient had been given recombinant follicular stimulating hormone 450 IU daily for 10 days, with gonadotropin-releasing hormone agonist and luteinising hormone added on day 7. The oestradiol level checked on day 9 was 9607 pmol/L (reference level, <10 000 pmol/L) and she was classified as low risk for OHSS. Ten follicles were retrieved, and six mature oocytes and three grade I embryos were transferred back. The luteal phase was supported by per-vaginal progesterone and intramuscular human chorionic gonadotropin (HCG) 1500 IU on days 15 and 18. The patient's neurological symptoms began 1 day after receiving the second dose of HCG. Initial laboratory studies on this admission to our hospital showed no evidence of haemoconcentration with a normal haemoglobin level of 139 g/L (reference range, 115-143 g/L) and haematocrit level of 0.40 (0.32-0.43). Abdominal ultrasound on admission revealed moderately enlarged ovaries (up to 7 cm each in diameter) and a small amount of ascitic fluid. Five days after her admission, she developed marked ascites and oliguria. The haematocrit level had risen to 0.44, and the serum creatinine level rose to 85 g/L (reference range, 44-80 g/L); haemoglobin level was 148 g/L and the pregnancy test was positive. She was treated with intravenous fluid replacement for severe OHSS; her condition improved gradually and 1 week later she was discharged with no residual weakness. Five weeks after her admission, ultrasound showed absence of fetal heartbeat and an evacuation was subsequently performed. After completion of a 3-month course of nadroparin, the prothrombophilia screen (clotting profile, lupus anticoagulant, homocysteine level, proteins C and S) was normal.

**Discussion**

Ovarian hyperstimulation syndrome is a serious complication of ovulation induction; the incidence of the severe form ranges from 0.5 to 5% of stimulated ovarian cycles. Age of less than 35 years, low body mass index, a history of allergies, and associated polycystic
卵巢過度刺激綜合徵併發腦靜脈栓塞

本文報告一名女子因不育接受體外受精胚胎移植，卻出現左半身癱瘓及頭痛的急性中風罕見病例，而中風的原因為卵巢過度刺激綜合徵導致腦靜脈栓塞。

卵巢過度刺激綜合徵是腎素-血管緊張素系統、血管內皮細胞成長因子、雌二醇、外末梢因子及Von Willebrand因子所影響的過度進展。

卵巢過度刺激綜合徵的併發症包括卵巢腫大、腹水、胸腔積液、腎及肝功能異常及罕見的血栓栓塞性疾病。體液的轉移到體外空間導致血管容積減少及血漿濃縮，造成血液粘度增加及凝血反應。卵巢刺激本身可以導致纖維蛋白原增加及抗凝血蛋白III的濃度下降，並導致凝血時間的顯著延長。高風險的患者使用低劑量的HCG或在雌二醇水平下降或穩定後延遲注射HCG，以及使用外源性孕酮於黃體期可以減少卵巢過度刺激綜合徵的風險。靜脈血栓包括內靜脈瓣、鎖骨下靜脈及下靜脈，較為罕見的動脈血栓包括肩靜脈、股靜脈、腸系膜靜脈及鎖骨下動脈，甚至包括動脈瘤。在這個患者，腦靜脈栓塞性疾病是主要的症狀，接著出現了卵巢過度刺激綜合徵的典型症狀。這個併發症應當考慮在低風險的患者，因為IVF是一個常見的程序。

References