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Review Article

Ultrafiltration and Reinfusion of Ascites to Treat Pregnancy Complicated with Severe Ovarian Hyper-Stimulation

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Abstract

Background: Ovarian hyper-stimulation syndrome (OHSS) is one of the most serious iatrogenic complications during in vitro fertilization-embryo transfer (IVF-ET). How to treat OHSS has attracted the attention of many scholars. Here we reported a case treated with reinfusion of ascites after concentration and ultrafiltration in hope of providing a new option in clinics.

Case presentation: The patient experienced severe OHSS demonstrated by severe electrolyte disorder, blood concentration, hypercoagulability and loss of protein. The symptom aggravated even with symptomatic treatment. After treat with reinfusion of ascites after concentration and ultrafiltration, the above-mentioned symptoms were significantly relieved. The patient was discharged with two alive embryos and low hospital expense.

Conclusion: We inferred reinfusion of ascites after ultrafiltration and concentration could achieved a good curative effect and can be further used in clinical practice.

Keywords: Ascites; Ultrafiltration; IVF-ET; OHSS; Reinfusion

Introduction

In recent years, the incidence of infertility due to anovulatory is getting higher and higher, which results to the boom of assisted reproductive technology (ART). OHSS mainly occurs in the patients with infertility, who experiences the treatment of ovulation induction. The incidence of OHSS ranges from 1% to 10% in IVF-ET cycle[1,2]. The main clinical manifestations of OHSS are enlargement of ovarian volume, increased permeability of capillary leading to the formation of local or systemic tissue edema [3-5]. Liver and kidney failure may be induced by hypovolemic shock, oliguria or even anuria due to decreased blood flow [6]. Here we report a case of pregnancy with severe OHSS treated by reinfusion of ascites after ultrafiltration and concentration, in hope of providing a new insight for the treatment of OHSS. This study was undertaken with ethical approval of the Human Ethics Committee of JiNan University, which was in accord with the Declaration of Helsinki. The enrolled patients have signed the informed consents.

Case Presentation

A 40-year-old woman was admitted to our hospital for "vomiting and abdominal distention for 8 days after embryo transplantation". Ultrasonography showed a large amount of ascites and increased bilateral ovary. The patient was supposed to experience OHSS. Laboratory tests demonstrated Total Protein 51.0g/L, Albumin 27.8g/L, HGB 184.40g/L, Hct 56.79%, PLT 499.0*10^9/L, WBC 32.85*10^9/L, Potassium 4.26mmol /L, Sodium 127.3mmol/L, Chlorine 95mmol/L, Plasma D-dimer quantification 2780ng/ml. All those index showed disordered electrolyte, blood concentration, hypercoagulability and loss of protein. To correct the disordered state, we adopted low molecular weight heparin to prevent thromboembolism, administration of human albumin, crystal and colloid supplementation to maintain osmotic pressure, diuresis and other symptomatic treatment. Unfortunately, the ascites continued to increase, Albumin and total protein continued to decrease. Two weeks later, ultrasonography demonstrated even

larger ovary and increased ascites in the liver and kidney crypt and the intestinal lacunae. To relieve the symptom, we performed reinfusion of ascites after ultrafiltration and concentration. WLFHY-500 computer ascites ultrafiltration and concentration system were adopted. The patients experienced the treatment twice every week, during which 2000-3000ml of ascites was filtered every time. After two times of treatment, the symptoms of abdominal distension were significantly relieved. The volume of urine was increased without further use of diuretic. Laboratory test indicators, such as blood routine and electrolyte examination fluctuated in the normal range. Also, the hypercoagulable state was corrected. Ultrasonography showed transplanted embryos were alive and the ascites was significantly decreased. The patient was discharged with good prognosis after 10 times of treatment.

Discussion

The pathogenesis of OHSS is complex and diverse, which is mainly related to the increased permeability of ovarian blood vessels and peritoneal epithelial cells [7]. Up to now, about 25 factors have been proved to be involved in the regulation of vascular permeability, such as renin-angiotensin-aldosterone system (RAS) [8], human chorionic gonadotropin beta subunit [9], estradiol [10], luteinizing hormone [9]、vascular endothelial growth factor. Among all of these factors, the role of vascular endothelial growth factor is particularly critical [11]. With the widespread development of assisted reproductive technology, the incidence of OHSS has gradually increased. About 2% to 6% of women who experiences ART experienced severe OHSS [12]. About 16% of OHSS patients were accompanied with a large amount of ascites, leading to abdominal distension, dyspnea and even acute abdominal symptoms [13]. Therefore, it is very important to treat ascites actively. At present, the clinical treatment of traditional abdominal puncture and drainage is generally adopted, but it is easy to cause the loss of a large number of protein [13]. Comparing with traditional abdominal puncture and drainage, reinfusion of ascites after ultrafiltration and concentration has the following advantages [14], such as effective relieve of abdominal compression, reuse of autologous albumin, and rapid increment of plasma albumin concentration. Also, reinfusion of ascites after ultrafiltration and concentration can alleviate the economic burden of patients and avoid the risk of infection some contagious disease when using blood-derived products. In our case, the disordered conditions of the patients were significantly ameliorated after two times of treatment and the patient was discharged with low expense. In a word, reinfusion of ascites after concentration and ultrafiltration is an effective treatment for a large number of ascites, dyspnea and oliguria induced by severe OHSS in pregnancy. It can rapidly improve the symptoms and shorten the period of the disease. It is worth further promotion and application in clinical practice.

Conflict Of Interest

The authors declare that they have no conflict of interests.

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