

Перший досвід відновлення репродуктивної функції у пацієнток із синдромом Ашермана за допомогою аутологічних мезенхімальних стовбурових клітин

M. Kozub, M. Kozub, K. Skybina
*Харківський національний медичний університет,
м. Харків, Україна*

The First Experience of Reproductive Function Restoration in Patients with Asherman's Syndrome Using Autologous Mesenchymal Stem Cells

M. Kozub, M. Kozub, K. Skybina
Kharkiv National Medical University, Kharkiv, Ukraine

The main goal of Asherman's syndrome treatment is to restore the volume and shape of the uterine cavity, regenerate the endometrium and reproductive function. Recently, in addition to ultrasound diagnostics of intrauterine synechiae, office hysteroscopy is widely used. The most standardized stages of Asherman's syndrome treatment are hysteroscopic dissection of the uterine cavity synechiae and endometrium re-adhesion prevention in postoperative period, which is achieved by introduction of intrauterine device, anti-adhesive drugs or balloon catheters inserted intrauterinely.

The main difficulties are to find effective ways to prevent adhesion that occurs after removal of mechanical means from the uterine cavity and ways to restore the endometrium morphology in patients wishing to achieve pregnancy. The most promising technology in this area is the use of autologous endometrial stem cells.

Here is a case of treatment of a reproductive age patient with infertility and Asherman's syndrome. The clinical case was a part of a clinical trial ClinicalTrials.gov Identifier: NCT04675970. On the eve of the operative stage for uterine cavity synechiae separation, 20.0 ml of venous blood was taken. Mesenchymal stem cells (MSCs) were isolated from the patient's peripheral blood using the magnetic separation method of the autoMACS Pro Separator (Miltenyi Biotec). According to the international instructions, 6th passage MSCs were clinically used. Confirmation of belonging of the derived cells to the MSCs group was performed using the set BioTechne FMC-020 (Great Britain). In addition, MSCs were differentiated to endometrial cells, which was confirmed using endometrial cell matching markers in generations P0-P3 (passage 0 – passage 3) with the MicroBead Kit (USA).

The surgical stage of treatment included office hysteroscopy, mechanical synechiolysis in the endocervix and endometrium and the introduction of a silver-containing intrauterine device. Subendometrial injection of autologous endometrial MSCs was performed to restore the endometrium structure at the end of hysteroscopy. High dose adjuvant estrogen therapy followed for 3 weeks. Pregnancy was achieved spontaneously 2 years after the intervention. The patient gave birth to a full-term baby girl.

The results of clinical case indicate the prospects for the use of autologous blood stem cells converted into endometrial cells in treatment of infertility in patients with CA when previous attempts to restore fertility by traditional therapies have failed.

Довгострокове зберігання насіння зразків генофонду рослин у Національному сховищі

Ю.О. Чернобай, В.К. Рябчун, Н.В. Кузьмишина,
Т.П. Шиянова, Р.Л. Богуславський
*Інститут рослинництва імені Юр'єва НААН України,
м. Харків, Україна*

Long-Term Storage of Seeds from Plant Gene Pool Samples in the National Depository

Yu.O. Chernobai, V.K. Riabchun, N.V. Kuzmyshyna,
T.P. Shyianova, R.L. Bohuslavskyi
*Yuriev Plant Production Institute of the National Academy
of Agrarian Sciences of Ukraine, Kharkiv, Ukraine*

Plant genetic resources plays a decisive role in the ensuring food security, economic, environmental and social stability on the planet as a whole and in Ukraine in particular. The most reliable way of gene pool accessions long-term storage is ex situ, i.e. in plant genetic resources banks (genebanks).

The National Plant Genebank of Ukraine is among the top ten genebanks in the world in terms of the volume and diversity of its collections. Its collection include 155.1 thousand accessions of 202 species. For the purpose of long-term storage of the National Genebank accessions, the National Seed Storage of Plant Gene Pool Accessions was established at the National Centre of Plant Genetic Resources of Ukraine, Yuriev Plant Production Institute. It has been in operation since 1995 and has the capacity to store 100,000 seed samples. The technological level of storage in the repository makes it possible to preserve the gene pool accessions seeds in a viable condition, depending on the crop and plant species, for 15–100 years or more.

The vast majority of cultivated plants used for food production and agriculture are reproduced from orthodox seeds which can be stored for a long time in specially equipped storages. It has been found that the conditions for long-term maintenance of the viability of such seeds are their drying to a moisture level specific to each species and variety at a temperature not exceeding 25°C, preferably with dry air; keeping them in hermetically sealed containers made of chemically inactive material and storing them at negative temperatures of about minus 18–20°C. This slows down the vital activity of the seeds, but remains the ability to restore it to the original level. Medium-term storage is carried out at temperatures between 0 and 4°C. Seeds of gene pool samples dried to a certain moisture level (5–9%) are stored in hermetically sealed containers: glass bottles, multilayer foil bags. The seeds are stored at three modes: A – under unregulated temperature conditions; B – in a refrigerator at 4°C; C – in freezers at –20°C. Seed moisture content, germination energy and germination rate are determined according to State Standard DSTU 4138–2002.

The National Seed Storage of Yuriev Plant Production Institute, which acts as the central seed gene bank of Ukraine, stores seeds of 70.9 thousand collection accessions belonging to 307 crops and 740 plant species. Of these, 49.6 thousand samples are in long-term storage at –18–20°C in hermetically sealed foil bags; 15.1 thousand samples are in medium-term storage in sealed foil bags at 4°C; 6.3 thousand samples are in short-term storage in hermetically sealed glass containers, in paper and fabric bags at ambient temperature and relative humidity.

According to the Resolution of the Cabinet of Ministers of Ukraine No. 527 of 1.04.1999, the Bank of Plant Genetic Resources with the National Seed Storage was included in the Register of Scientific Objects of National Heritage of Ukraine.

