Перспективным *является изучение функционального состояния кардиореспираторной системы и ОДА у волейболистов, возникающего под влиянием разработанной программы физической реабилитации, с целью оптимизации продолжительности пребывания их на этапах восстановительного лечения.*

Литература

1. Гаркави А.В. применение ударно-волновой экстракорпоральной терапии в лечении болевых синдромов области коленного сустава / А.В. Гаркави, А.Е. Семевский // Медицинская помощь. №1. – 2006. – С. 20-23.
2. Дубровская А.В. Средства профилактики травм и заболеваний опорно-двигательного аппарата у спортсменов / А.В. Дубровская, В.И. Дубровский // Теория и практика физической культуры. - 2007. - №3. - С. 47-49.
3. Спортивные травмы. Клиническая практика предупреждения и лечение / [под общ. ред. Ренстрема П.А.] – Киев: Олимпийская литература, 2003. – 470 с.
4. Aagaard H. Injuries in elite volleyball / Aagaard H., Jorgensen U. // Scand J Med Sci Sports.–1996.–Vol.6. – P. 228–232.
5. Cook J.L. Vascularity and pain in the patellar tendon of adult jumping athletes: a 5 month longitudinal study / Cook J.L., Malliaras P., De Luca J. [et al.] // Br J Sports Med. – 2005. – Vol.39. – P. 458 – 461.
6. Gisslen K. Neovascularization and pain in jumper's knee: a prospective clinical and sonographic study in elite junior volleyball players / Gisslen K., Alfredson H. // Br J Sports Med. – 2005. – Vol.39. – P.423–428.
7. Malliaras P. Anthropometric risk factors for patellar tendon injury among volleyball players / Malliaras P., Cook J.L., Kent P.M. // Br J Sports Med. – 2007. Vol.41. – P. 259–263.
8. Reeser J.C. Strategies for the prevention of volleyball related injuries / Reeser J.C., Verhagen E., Briner W.W. [et al.] // Br J Sports Med. – 2006. – Vol.40. – P. 594–600.

Реферати

ЛІКУВАННЯ ТА ПРОФІЛАКТИКА ТЕНДИНІТУ ЗВ'ЗКИ НАДКОЛІННИКА У ВОЛЕЙБОЛИСТІВ

ФедорченкоА.І.

Лікування та профілактика тендиніту зв'язки надколінника у волейболістів. А.І. Федорченко. Харківський міський волейбольний клуб «Локомотив». Травмою, що найбільш часто зустрічається у волейболістів, є тендиніт зв'язки надколінника. Проведений порівняльний аналіз існуючих методів лікування та профілактики даної патології і розроблений найбільш оптимальний комплекс відновних засобів, який сприяє швидкому одужанню спортсмена.

Ключові слова: тендиніт зв'язки надколінника, ударнохвильова терапія, кінезіологічне тейпування, реабілітація.

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TREATMENT AND PROPHYLAXIS OF TENDINITis OF patella's COPULA oF VOLLEY-BALLERS

Fedorchenko A.I.

Treatment and prophylaxis of tendinitis of copula of patellar for volleyball players. A.I. Fedorchenko. Kharkiv city volleyball club "Lokomotiv". Most often meeting trauma at volleyball players – a tendinitis of ligament of a whirlbone. The comparative analysis of existing methods of treatment and preventive maintenance of the given pathology is carried out and the optimal complex of regenerative agents which promotes the prompt recover of the sportsman is developed.

Keywords: a tendinitis of ligament of a whirlbone, extracorporeal shock-wave therapy, kinesio taping, rehabilitation.

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Feskov O.M., Feskova L.A., Zhylkova I.S., Bezpechna I.M., Blazhko O.V.
Clinic of Professor Feskov A.M., "Center of Human Reproduction", Kharkiv

THE INFLUENCE OF INTRAUTERINE ADMINISTRATION OF PERIPHERAL BLOOD MONONUCLEAR CELLS ON IMPLANTATION RATES IN "FRESH" AND "CRYO" IVF PROGRAMS

The influence of intrauterus application of peripheral blood mononuclear cells (PBMC) on the embryo implantation rate for infertile patients in fresh IVF programs and after using of frozen embryos was investigated. Application of PBMCs increases possibility of embryo implantation and pregnancy rate almost in 1.9 times in fresh IVF cycles. Application of PBMC for frozen embryos increases implantation rate in 2.0 times. For embryo cryopreservation the method of vitrification was applied.

Key words: embryo implantation, PBMC, vitrification, clinical pregnancy.

Embryo implantation in the uterus is one of the most important stages to achieve pregnancy in infertile patients after IVF cycle. The endometrial state of the patient should be regulated by the endocrine system. It is a well-known fact that human endometrium is able to accept embryos only during some limited period. So it is very important to prepare endometrium to embryo transfer to achieve embryo implantation taking into account that human endometrium is considered to have limited period for embryo receptivity [1]. Recent investigations have proved that there was a great

role of immune system in the processes of embryo implantation and early pregnancy development. There is a suggestion that maternal immune cells are able to support the process of embryo implantation. However, the precise mechanism as to how these processes are immunologically regulated, are still unknown. It has been already been demonstrated that human luteal cells in corpora lutea (CL) of early pregnancy express human leukocyte antigen (HLA)-DR and lymphocyte functional antigen (LFA)-3, suggesting a physiological interaction between lymphocytes and luteal cells during early pregnancy. It was postulated that immune cells in early pregnancy possess information on the presence of the embryo, transmit it to the CL and regulate CL differentiation. The peripheral immune cells possess information on the presence of the embryo and facilitate embryo implantation probably by regulating of ovarian function or endometrium function [2]. PBMCs obtained from women early in pregnancy were shown to promote murine blastocyst spreading and invasion and BeWo cells invasion in vitro, and these promoting effects were enhanced by HCG [3]. It is should pay attention to the fact that HCG is able to stimulate chemokine production by PBMC [4]. The mentioned above facts led to suggestion that the maternal immune system supports embryo implantation in the uterus as a complementary pathway and that HCG can induce functional changes in PBMC to facilitate embryo implantation. Based on the above evidence, the aim of our work was to investigate and to compare pregnancy rates in infertile patients after IVF cycles using intrauterine transfer of peripheral blood mononuclear cells (PMBC) before embryo transfer in "fresh" and "cryo" IVF programs.

The aim of the work was to examine the influence of intrauterine mononuclear cells application on embryo implantation rates for infertile patients in "fresh" and "cryo" IVF cycles. All the patients included in this investigation have already had two or more unsuccessful "fresh" IVF attempts and at least one failed "cryo" IVF protocol.

Materials and methods. One hundred infertile couples were investigated in fresh IVF. All the patients had experienced two or more unsuccessful IVF cycles. One hundred infertile patients were divided into two groups. Both groups included 50 patients. PMBCs were not used in the first group. The middle age of the patients in the first group was 37.5±3.4 years. The middle age of the patients in the second group was 39.5±5.5 years. PMBCs were used for the patients of the second group. Totally 60 cycles with frozen embryos were carried out. All 60 patients were divided in two groups. Both groups included 30 patients. PMBCs were not used in the first group. The middle age of the patients in the first group was 35.5±3.4 years. The middle age of the patients in the second group was 36.5±5.5 years. PMBCs were used for the patients of the second group. IVF procedure. For controlled ovary stimulation in fresh IVF cycles protocol with a-GnRH was used for patients of both groups. The period of ovary stimulation for every patient was not less then 10 days. To the moment of transvaginal puncture the average size of follicles was about 18 mm. To maintain the luteal phase the medicines with progesterone were used for patients of both groups.

After oocytes were retrieved they were cultured in Universal IVF Medium (Medicult) in 5.5 % CO2 and 36.8ºC. The embryos were cultured in Universal IVF Medium (Medicult) during first three days of embryo development and in BlastAssist Medium (Medicult) during fourth and fifth day of culture. The embryo transfer was done using UTM Medium (Medicult). Vitrification and embryo thawing. Previous vitrification was applied for embryos on day 4 (compact morula) or day 5 (early blastocyst) [5]. The standard method of vitrification suggested by Medicult was used. The frozen embryos were stored during the period from 3 months to 1 year. For thawing the standard Medicult protocol was applied. The embryo transfer was done using UTM Medium (Medicult). Two blastocysts were chosen for embryo transfer.

Preparation and intrauterine application of PBMC. In fresh IVF cycles blood samples were obtained in the day of transvaginal puncture. PBMCs were isolated by Ficoll-Hypaque centrifugation. After centrifugation PBMCs were collected from the interphase layer and washed with Roswell Park Memorial Institute 1640 (RPMI 1640, Sigma). PBMCs were cultured in the mixture of RPMI 1640, 10 % SPS and HCG (5 IU/ml) for 48 hours [6]. The conditions of culture were 5 % CO2 and 37 ºC. Fresh PBMCs were obtained from the same patient on day 2 of embryo culture. Fresh isolated and cultured PBMCs were mixed and transferred to uterus cavity [7].

Results and discussion. On the day of embryo transfer the endometrium size was 9-11 mm as for the patients in fresh IVF cycles as for the patients who were prepared for transfer of thawed embryos. Since the embryos were transferred the medical maintenance by progesterone was applied for all the patients. The implantation was confirmed by blood test on b-hCG in two weeks after embryo transfer. The clinical pregnancy was confirmed by ultrasound examination in three weeks after embryo transfer.

After PMBCs application in fresh cycles the implantation rate was 38.0 % (19 clinical pregnancies). Among them there were 63.1% implantation rate after transfer of embryos on the fifth day of their culture (12 pregnancies) and 36.9 % implantation rate after transfer of embryos on the third day of their culture (7 pregnancies). As for the group of patients without PBMCs the implantation rate was 20.0 % in "fresh" IVF cycles (10 pregnancies). Among them there were 60.0 % implantation rate after transfer of embryos on the fifth day of their culture (6 pregnancies) and 40.0 % implantation rate after transfer of embryos on the third day of their culture (4 pregnancies).

After that the difference between pregnancy rates in "fresh" and "cryo" IVF protocols in groups both with PBMCs application and without one was investigated. The implantation rate and clinical pregnancy rate in the PBMC-treated groups were significantly ($p < 0,05$) higher than those in the non-treated groups both for fresh IVF cycles and after thawed embryos transfers (table 1, 2).

More deep investigations in this field could explain the role of immune system in the implantation process and early pregnancy control. By improving the culture conditions of PBMC, more effective changes in immune blood cells function can be applied on the future.

Table 1

Implantation rates in "fresh" IVF cycles

	Group 1	Group 2
Total rate	20.0 %	38.0 %
ET on day 3	40.0 %	36.9 %
ET on day 5	60.0 %	63.1 %

Table 2

Implantation rates in "fresh" and "cryo" IVF cycles

	Clinical pregnancy rate after PBMC	Clinical pregnancy rate without PBMC
Fresh IVF cycles	38.0 % (19 pregnancies after 50 embryo transfers)	20.0 % (10 pregnancies after 50 embryo transfers)
Embryo transfer after vitrification	33.3 % (10 pregnancies after 30 embryo transfers)	16.6 % (5 pregnancies after 30 embryo transfers)

Thus, the exact mechanism of immune regulation of implantation remains unknown, intrauterine application of PBMC can be used for infertile therapy. The attention should be paid to the patients who didn't receive successful embryo implantation after the transfer of morphologically high quality embryos.

Conclusion

This study showed that intrauterine application of PBMC definitely ($p < 0,05$) increased the implantation rates and clinical pregnancy rates both after embryo transfer in fresh IVF cycles and after the thawed embryos transfer. So such method could be an effective approach in infertility treatment. Such method can be applied for couples who have already had unsuccessful IVF attempts in the past.

References

1. Human chorionic gonadotropin (HCG) activates monocytes to produce IL-8 via a different pathway from luteinizing hormone (LH) / HCG receptor system. / Kosaka K., Fujiwara H., Tatsumi K. et. al // J. Clin. Endocrinol. Metab. - 2006. – V. 21, № 12. - P. 3290-3294.
2. Identification of molecules and mechanisms involved in the "early pregnancy factor" system. / Clarke F. // Reproduction and Fertility. – 1992. – № 4. – P. 423-433.
3. Immune cells contribute to systemic cross-talk between the embryo and mother during early pregnancy in cooperation with endocrine system. / Fujiwara H. // Reproductive. Medicine and Biology. – 2006. – № 5. – P. 19-29.
4. Intrauterine administration of autologous peripheral blood mononuclear cells promotes implantation rates in patients with repeated failure of IVF-embryo transfer. / S. Yoshioka, H. Fujiwara, T. Nakayama, K. Kosaka, T. Mori, S. Fujii. // Human Reproduction. - 2007. – № 12. - P5199-5208.
5. Progesteron supplementation increases luteal phase endometrial thickness and estradiol levels in-vitro fertilization / Segal S, Casper RF. // Hum Reprod. – 1992. - № 7. - P. 1210–1213.
6. The role of the endometrium during embryo implantation. / Lessey B. // Human Reproduction. – 2000. – № 6. – P. 39-50.
7. Therapeutic maturation of endometrium in vitro fertilisation and embrio transfer / Ben Nun L., Jaffe R., Fejgin MD [et al.] // Fertil Steril. – 1992. - №57. – P. 953–962.

Реферати

ВПЛИВ ВНУТРІШНЬОМАТКОВОГО ВВЕДЕННЯ МОНОНУКЛЕАРНЫХ КЛІТИН ПЕРИФЕРИЧНОЇ КРОВІ НА ЧАСТОТУ ІМПЛАНТАЦІЇ ЕМБРІОНА У «НАТИВНИХ» ТА «КРІО» ЦИКЛАХ ЕКЗ

Феськов О.М., Феськова І.А., Жилкова Є.С., Безпечна І.М., Блажко О.В.

Досліджено вплив внутрішньоматкового введення мононуклеарных клітин периферичної крові на частоту імплантації ембріона у «нативних» та «кріо» циклах ЕКЗ. Застосування мононуклеарных клітин периферійної крові збільшує частоту імплантації ембріонів та частоту наступу вагітності майже в 1,9 рази в «нативних» та майже в 2,0 рази у «кріо» циклах ЕКЗ. Для заморожування ембріонів був застосований метод вітрифікації.

Ключові слова: імплантація ембріона, мононуклеарні клітини крові, вітрифікація, клінічна вагітність.

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ВЛИЯНИЕ ВНУТРИМАТОЧНОГО ВВЕДЕНИЯ МОНОНУКЛЕАРНЫХ КЛЕТОК ПЕРИФЕРИЧЕСКОЙ КРОВИ НА ЧАСТОТУ ИМПЛАНТАЦИИ ЭМБРИОНА В «НАТИВНЫХ» И «КРИО» ЦИКЛАХ ЭКО

Феськов А.М., Феськова И.А., Жилкова Е.С., Беспечная И.М., Блажко Е.В.

Исследовано влияние внутриматочного введения мононуклеарных клеток периферической крови на частоту имплантации эмбриона в «нативных» и «крио» циклах ЭКО. Применение мононуклеарных клеток периферической крови увеличивает частоту имплантации эмбриона и частоту наступления беременности практически в 1,9 раз в «нативных» и приблизительно в 2,0 раза в «крио» циклах ЭКО. Для замораживания эмбрионов применен метод витрификации.

Ключевые слова: имплантация эмбриона, мононуклеарные клетки крови, витрификация, клиническая беременность.