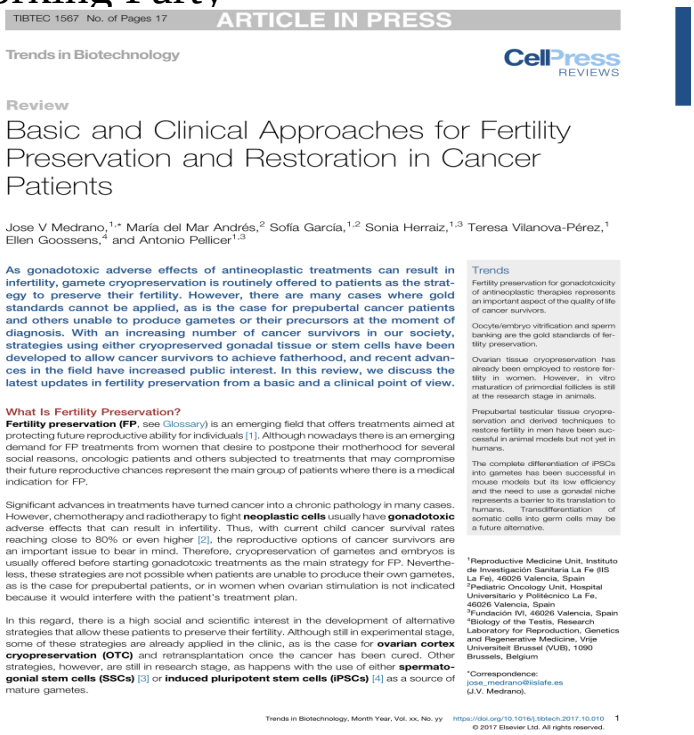
Storage of Ovarian and Prepubertal Testicular Tissue: Report of a Working Party



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Trends in Biotechnology

CellPress REVIEWS

Review

Basic and Clinical Approaches for Fertility Preservation and Restoration in Cancer Patients

Jose V Medrano,[1,*] María del Mar Andrés,[2] Sofía García,[1,2] Sonia Herraiz,[1,3] Teresa Vilanova-Pérez,[1] Ellen Goossens,[4] and Antonio Pellicer[1,3]

As gonadotoxic adverse effects of antineoplastic treatments can result in infertility, gamete cryopreservation is routinely offered to patients as the strategy to preserve their fertility. However, there are many cases where gold standards cannot be applied, as is the case for prepubertal cancer patients and others unable to produce gametes or their precursors at the moment of diagnosis. With an increasing number of cancer survivors in our society, strategies using either cryopreserved gonadal tissue or stem cells have been developed to allow cancer survivors to achieve fatherhood, and recent advances in the field have increased public interest. In this review, we discuss the latest updates in fertility preservation from a basic and a clinical point of view.

Trends

Fertility preservation for gonadotoxicity of antineoplastic therapies represents an important aspect of the quality of life of cancer survivors.

Oocyte/embryo vitrification and sperm banking are the gold standards of fertility preservation.

Ovarian tissue cryopreservation has already been employed to restore fertility in women. However, in vitro maturation of primordial follicles is still at the research stage in animals.

Prepubertal testicular tissue cryopreservation and derived techniques to restore fertility in men have been successful in animal models but not yet in humans.

The complete differentiation of iPSCs into gametes has been successful in mouse models but its low efficiency and the need to use a gonadal niche represents a barrier to its translation to humans. Transdifferentiation of somatic cells into germ cells may be a future alternative.

What Is Fertility Preservation?

Fertility preservation (FP, see Glossary) is an emerging field that offers treatments aimed at protecting future reproductive ability for individuals [1]. Although nowadays there is an emerging demand for FP treatments from women that desire to postpone their motherhood for several social reasons, oncologic patients and others subjected to treatments that may compromise their future reproductive chances represent the main group of patients where there is a medical indication for FP.

Significant advances in treatments have turned cancer into a chronic pathology in many cases. However, chemotherapy and radiotherapy to fight **neoplastic cells** usually have **gonadotoxic** adverse effects that can result in infertility. Thus, with current child cancer survival rates reaching close to 80% or even higher [2], the reproductive options of cancer survivors are an important issue to bear in mind. Therefore, cryopreservation of gametes and embryos is usually offered before starting gonadotoxic treatments as the main strategy for FP. Nevertheless, these strategies are not possible when patients are unable to produce their own gametes, as is the case for prepubertal patients, or in women when ovarian stimulation is not indicated because it would interfere with the patient's treatment plan.

In this regard, there is a high social and scientific interest in the development of alternative strategies that allow these patients to preserve their fertility. Although still in experimental stage, some of these strategies are already applied in the clinic, as is the case for **ovarian cortex cryopreservation (OTC)** and retransplantation once the cancer has been cured. Other strategies, however, are still in research stage, as happens with the use of either **spermatogonial stem cells (SSCs)** [3] or **induced pluripotent stem cells (iPSCs)** [4] as a source of mature gametes.

[1]Reproductive Medicine Unit, Instituto de Investigación Sanitaria La Fe (IIS La Fe), 46026 Valencia, Spain
[2]Pediatric Oncology Unit, Hospital Universitario y Politécnico La Fe, 46026 Valencia, Spain
[3]Fundación IVI, 46026 Valencia, Spain
[4]Biology of the Testis, Research Laboratory for Reproduction, Genetics and Regenerative Medicine, Vrije Universiteit Brussel (VUB), 1090 Brussels, Belgium

*Correspondence:
jose_medrano@hisiafe.es
(J.V. Medrano).

Royal College of Obstetricians and Gynaecologists (Great Britain) Title(s): Storage of ovarian and prepubertal testicular tissue: report of a working party/ Royal.transplantation: a report on the expert meeting of the. Paediatric Diseases Working Party (PDWP) of the European. Society for Blood and Marrow . of autologous ovarian tissue cryopreserved from an almost. year-old .. prepubertal boys, testicular tissue is accessible for cryopreserva-. tion pre-SCT.management of preservation of reproductive function in young patients with .. Storage of ovarian and prepubertal testicular tissue: report of a working party.of germ cells within the ovary and decrease testicular spermatogenesis Obstetricians and Gynaecologists working party; and the American Society of Clinical Storage of such tissue in the UK is subject to tissue reimplanted, and the reporting of outcomes should be use in IVF has not been used in prepubertal boys.Progress in long term ovarian tissue (cryo)preservation has led to Party Report on the Management of gonadal toxicity resulting from the for Good Practice on the Storage of ovarian and prepubertal testicular tisse (Nugent The British Fertility Society convened this multidisciplinary Working Group to define a strategy for.In June , the first report was published of a live birth after the Paediatric Diseases Working Party (PDWP) of the European Society Cryopreservation of ovarian tissue for potential later maturation and . Since , cryopreservation of testicular tissue from prepubertal boys has also been an option.Case report. We report a case of oocyte cryopreservation and ovarian tissue cryopreservation in a ton et al.,1 and stored under liquid nitrogen. A specimen . Storage of Ovar- ian and Prepubertal Testicular Tissue: Report of a Working Party.embryonal 15%; lymphona 11%; soft tissue 6%; bone 5%; others 5%. Over the . Early reports of ovarian function following the treatment of Hodgkin's .. a report from a working party on the storage of ovarian and prepubertal testicular tissue.Storage of ovarian and prepubertal testicular tissue. Report of a working party. Royal College of Obstetricians and Gynaecologists, London; Storage of ovarian and pre-pubertal testicular tissue: report of a Working Party. London: Royal College of Obstetricians and Gynaecologists.Ovarian tissue cryopreservation is another fertility preservation option, and may be may also provide an opportunity for fertility preservation for prepubertal boys. cancer cells following autotransplantation of cryopreserved testicular tissue. Two clinical working groupsAdolescent and Young Adult Oncology and the.and many have stopped storing ovarian tissue. vation of male immature testicular tissue. .. and Prepubertal Testicular Tissue Report of a Working Party.The Working Party is grateful for the comments provided by the British Fertility . The report should be equally valuable to commissioners of NHS services Where sperm are absent from the ejaculate, testicular sperm extraction can sometimes be based egg and ovarian tissue storage facility be developed at a number of.testicles or ovaries) and an impact on cancer risk (ovarian stimulation in the case Prepubertal Testicular TissueReport of A Working Party.There are no reports of uterine . irradiation (20 30 Gy) may have preservation of ovarian function. .. prepubertal testicular tissue: report of a working party. Royal College of

Obstetricians and Gynaecologists Storage of. Ovarian and Prepubertal Testicular Tissue. Report of a Working Party. London.