

Cryopreservation of Cord Blood

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ABSTRACT

The cord blood on post processing, are used for various community purposes, for medical therapeutic purposes and for wound healing purposes. The various tissues stored in cryopreservations are cord blood, cord tissue, Femme and dental stem cell samples, for lifelong period. The community requirements for the stem cells are for various healing and tissue regeneration purposes. The process of cryopreservation mainly involves the CRF (control rate freezers), cryo cart and Liquid Nitrogen 2 vessel. The process of initial transport of cord blood from the post processing of samples, in the cleaning room after addition of DMSO is by the ice tray in cool condition. After the initial transport, the samples are stored in CRF for a period of 40 minutes and noted in the software. The entire process to be completed within 1 hour.

Keywords: Cord blood; LN2vessel; Cryocart

INTRODUCTION

The chemical reactions in living cells are significantly decreased at low temperatures, a process that can contribute to the likelihood of long-term cell and tissue survival. Freezing is lethal to most living organisms, however, because both intracellular and extracellular ice crystals form and result in changes in the chemical environment of cells contributing to cellular mechanical restrictions and injury [1]. Cryopreservation is a procedure that preserves biological samples for some significant time in a suspended suspension state at cryogenic temperature, and is used to retain the fine cell structure [2]. Banked, separate blood units of the umbilical cord (CBU) provide a rich supply of hematopoietic stem cells for hematopoietic reconstitution. Potential assays on attached segments were used for removing CBU from the bank to the transplant centre. Historically, CBUs is produced and cryopreserved in bags placed around the top of the tape, with three segments (made from the tubing used to fill the bag). The CBU is overwrapped before cryopreservation, placed in a metal tape, and frozen in a control-rate freezer, then immersed for long-term storage under liquid nitrogen. Segments can be withdrawn from the cassette after cryopreservation, without damaging the container, for HLA printing, potency assays or other testing. Last year we modified the layout of the cryobag to create a fourth section, in an attempt to expand the amount of segments available for testing [3]. The pieces were arranged with two segments around the top and two segments twisted at 90 degrees to conform between the bag's 20 percent and 80 percent sections, to blend into the tape.

While doing our annual stability check, we found that the two distal segments, located between the 20 percent and 80 percent compartments, yielded lower power outcomes than the segments at the top of the cassette installed [4]. We looked at the finding as mentioned below.

Cryopreservation is the process of the cold storage of the cord tissue and other tissues for the purposes of various wound healing purposes and ailments [5]. The temperature to be maintained is -140 degree celsius and the tissue should be preserved by addition of cryopreservatives. The maximum temperature that can be reached for preservation is -196 degree celsius. The LN2 vessel to be refilled before the storage of the samples. The oxygen stability, humidity and the pressure to be monitored periodically for stability of the product [6].

METHODS

- Single storage method.
- Dual storage method.

Equipment needs are CRF, LN2 vessel, cryocart, towers for holding the sample and Dry shipper.

Temperature conditions-

The temperature had to be periodically checked on the basis of four stages. Stage 1- -1 to -10 deg celsius.

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Stage 2- -10 to -20 deg celcius

Stage 3- -1 to -40 deg celsius

Stage 4- -40- -140 deg celcius

Volume of samples

The sample to be stored in the volume are 20 mL and for dual storage purpose 5 mL is also used. The tower contains 10 in 1 racks for holding the samples for storage and for cord tissues, the tower contains 8 in 1 racks for the storage purposes.

Calibration

The annual calibration and integrity check to be maintained by the external vendor source and by the medical directors.

The sample receiving records and the temperature maintenance records to be periodically followed.

CONCLUSION

Breast cancer is the world's leading cancer, women, and is growing particularly in developing countries where most cases are diagnosed at a late stage.

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