Stem cell banking, a hit with couples

ZEENIA F BARIA | Feb 19, 2011, 12.00 AM IST

An increasing number of couples are opting for stem cell banking, discovers Zeenia F Baria

Stem Cell Expert Dr Satyen Sanghavi says that stem cells are cells found in all multi cellular organisms. They're found throughout the body, but especially in bone marrow, in the peripheral blood (your circulating blood) and in the umbilical cord. "They are characterised by the ability to renew themselves through mitotic cell division and differentiate into a diverse range of specialised cell types. Stem cells divide themselves many times to make new stem cells. They can also transform into specific cells needed by the body to heal itself. Stem cells for transplantation can come from yourself/ your own body (an autologous transplant) or, more commonly from a donor (an allogeneic transplant). Stem cells can now be grown and transformed into specialised cells with characteristics consistent with cells of various tissues such as muscles or nerves through cell culture. Highly plastic adult stem cells from a variety of sources, including umbilical cord blood and bone marrow, are routinely used in medical therapies," says Dr Sanghavi.

What is Stem Cell Banking?
A stem cell bank is a facility, which stores stem cells for future use. Umbilical cord blood is blood that remains in the placenta and in the attached umbilical cord after childbirth. Cord blood is obtained from the umbilical cord at the time of childbirth, after the cord has been detached from the newborn. Cord blood is collected because it contains stem cells, including hematopoietic cells, which can be used to treat hematopoietic and genetic disorders. Cord blood contains all the normal elements of blood - red blood cells, white blood cells, platelets and plasma. But it is also rich in hematopoietic (blood-forming) stem cells, similar to those found in bone marrow. This is why cord blood can be used for transplantation as an alternative to bone marrow.

Why is it recommended?
Infertility Specialist, Dr Nandita Palshetkar says that stem cell banking is a simple, safe and painless procedure and happens immediately after birth after cutting the cord. "The cord blood collected is then transferred to the laboratory and frozen in cryogenic storage tanks for long-term preservation.

Nowadays, the umbilical cord is also stored. Stem cells represent an exciting area in medicine because of their potential to regenerate and repair damaged tissue. Some current therapies, such as bone marrow transplantation, already make use of stem cells and their potential for regeneration of damaged tissues. Other therapies are under investigation that involve transplanting stem cells into a damaged body part and directing them to grow and differentiate into healthy tissue," says Dr Palshetkar.

Benefits

Storing your baby's umbilical cord blood stem cells is an investment towards the future health of the family. "It ensures an exact match for the child and a more likely match for another blood-related family member, should the stem cells be needed for treatment. Unfortunately, if a stem cell treatment is indicated, families that have not privately banked their child's cord blood stem cells end up searching for an appropriate source of compatible stem cells - searches, which can take months and still be unsuccessful. Cord blood stem cells from a family member are much more likely to be successfully transplanted than those from an unrelated donor," says Dr Sanghavi.

Difference between stem cells from cord blood v/s bone marrow

Both bone marrow and cord blood stem cell transplants are designed to replace unhealthy cells with healthy ones. "Cord blood is blood that is collected from an infant's umbilical cord after delivery, so that it may be tested, frozen and subsequently stored in a cord blood bank for future use. A bone marrow transplant, on the other hand, involves the use of bone marrow that is transplanted from a donor into the recipient in order to cultivate new stem cells. Stem cells are available in greater proportion from the umbilical cord as compared to bone marrow. Cord blood cells are have more generative capacity as compared to bone marrow cells. Cord blood cells can be used for those with lung, heart and kidney disease where bone marrow cells are to be avoided," says Dr Palshetkar.

Conclusion

Gynaecologist Dr Sonal Kumta says that more parents should opt for stem cell banking. "Cord blood can be stored by cryopreservation for future use for your child or any other family member. The baby will have a 100 per cent match with these cells and siblings will have 25 per cent match. This once in a lifetime opportunity helps preserve a biological resource for future use. It helps protect one from incurable diseases like leukemia and thalassemia while trials are in progress for Alzheimers, cartilage

regeneration, diabetes, heart diseases, liver diseases, multiple sclerosis, muscular dystrophy, spinal cord injury and even strokes."

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