circle of life

SHERNAAZ ENGINEER DETAILS A REVOLUTIONARY PROCEDURE THAT PROMISES HOPE FOR CANCER PATIENTS

PHOTOGRAPHS BY ANKUR CHATURVEDI, SANDEEP BARGE.

One of the advantages of our age is easier accessibility to cutting edge innovations in medicine, which are increasingly adding new life to life. Cord blood banking is one such breakthrough, and while the ground is still being tested for its efficacy, the early prognosis is positive.

KV Subramaniam, President and CEO, Reliance Life Sciences, explains, "Human umbilical cord blood is a rich source of stem cells. These are undifferentiated cells in the body which can differentiate into various other cell lineages. Stem cells help regenerate cells and tissues. Cord blood banking entails collection, processing and storage of stem cells from umbilical cord blood for future use, in the event of contracting a disease that can be cured by stem cell transplantation."

He adds, "There are two ways in which this can be done. Firstly, there's Autologous Transplantation, using the patient's own stem cells banked earlier. Secondly, there is Allogenic Transplantation, using cells from a non-related patient subject to matching the Human Leukocyte Antigen (HLA). The process of cord blood banking involves the collection of umbilical cord blood, soon after the birth of a child, in special bags. Thereafter, it is tested for infectious diseases and cell counts, processed to concentrate cord blood stem cells, and stored in liquid nitrogen through a controlled freezing programme, for reuse when required."

Harvesting stem cells from the umbilical cord is fairly new. Till recently, the umbilical cord, along with the placenta, was discarded following the birth of a baby. It's now known that blood retrieved from the umbilical cord can be a rich source of stem cells. This is because the concentration of foetal type haemoglobin in stem cells is much greater at infancy.

These unspecialised blood cells (stem cells) also continually replicate to produce all other cells, including blood-clotting platelets and the red and white blood cells. It is also the same stem cells that help enhance a person's blood-producing capability and immune system, when it might be damaged or destroyed by cancer treatments or impaired through an inherited genetic defect.

Hence, banking stem cells from umbilical cord blood is being considered an answer to various disorders that affect the blood and immune system. What's more, stem cells derived from this source can be transplanted not only into the donor, but also to a family member or an unrelated recipient.

Dr Duru Shah, one of Mumbai's foremost gynaecologists, believes that awareness will take a while and very few patients today opt for banking the cord blood of their new born babies. "There is both public and private banking of cord blood, although as yet the possibilities of using it are limited."

Make-up and Hairstyling by Dilshad Ukaji.

"However, there's no doubting that stem cells do help in the regeneration of tissues and new cells. Fresh research is being conducted all the time. But it will take a while for the results to be quantified."

Dr Duru Shah

Obstetrician and Gynaecologist. She is involved in the harvesting of the cord blood at time of birth

"You need the right talent, conformance with regulatory requirements and international accreditations. Cord blood banking is not just about storing cord blood and making it available for future use."

KV Subramaniam
President and CEO, Reliance Life Sciences. The facility is amongst the first in the country to offer a cord blood bank, in accordance with international standards

KV Subramaniam counters, "Cord blood stem cells can be used for treating a number of haematological disorders and cancers. Actually, cord blood stem cells can be used to treat patients of any age. However, the experience has been largely limited to infants."

Dr Maheboob M Basade, Consultant, Haemato-Oncologist and Stem Cell Transplantation Specialist, at Mumbai's Jaslok Hospital, adds that aplastic anaemia, a condition that can occur at any age, wherein there is no blood formation, responds well to stem cell transplantation. He says there are various ways of obtaining stem cells. The most popular, as already explained, is at birth, when the stem cells are culled from the umbilical chord and placenta, and the frozen unit can be administered at a later date. "Generally, cord blood banked at birth is adequate only until the age of about 15, after which you need more cord blood. So one may need to take stem cells from a brother or sister. And if there is no family donor then one may need to go to a cord blood bank and obtain it," Dr Basade elucidates.

KV Subramaniam expands, "To make cord blood stem cells available to outsiders who have not banked with Reliance Life Sciences, the Human Leukocyte Antigen (HLA) typing of the patient would be required. The process of matching the HLA of the patient with the HLA of the cord blood stem cells stored in the public repository would then be undertaken. Once there is a match (ideally a 6/6 match), the cord blood stem cells unit can be made available for transplantation, after completing the processes related to legal aspects and sales."

Dr Basade continues, "Till recently, it was bone marrow that was considered to be the most common source of stem cells. A bone marrow transplant, however, demands a nearly perfect match of HLA between the donor and the recipient, for the process to succeed. In contrast, the donor stem cells from cord blood appear more likely to engraft, even when the tissue matches are not 100 per cent absolute. Transplants can be done with umbilical cord blood stem cells even when only three of the six antigens between the donor and the recipient match." Shortage of donors, owing to the painful mode of collection, is another obstacle that plagues bone marrow transplants. Harvesting stem cells from bone marrow entails a surgical procedure that is usually carried out under general anaesthesia. This also involves post-operative pain to the donor. Stem cells from cord blood are relatively much easier to get because they are readily obtained from the placenta at the time of delivery.

However, there is the contention that cord blood transplantation may not be the miracle cure as is often touted. Dr Basade sounds a note of caution when he confesses, "A lot of false claims are being made with regard to cord blood transplantation and its efficacy. We have to stress that the approval for its use is still very limited in India. We should not fall into the trap of the hype that surrounds it. There are a lot of unethical promotions that are being conducted to beguile the lay person, by overstating the claims. It is very expensive to collect, store, buy and transplant stem cells, and success rates are variable."

"The experience with cord blood transplants in India is limited," admits KV Subramaniam. "However, more than 9,000 cord blood transplants have been done, primarily in the USA and Europe, and the results have been very promising. Till recently, cord blood transplants have been primarily used for paediatric age group patients. However, they are now beginning to be used for adult patients as well," he adds.

Dr Duru Shah is also sceptical about the over-enthusiasm that sometimes accompanies the aggressive hard-sell of cord blood banking by private operators. She does not randomly recommend it at birth to all her patients. "If parents are particularly keen, and if they can afford the costs that accompany cord blood banking, I do suggest it. However, the fact remains that

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Teak wood, Tobacco Chair from Gold Earth

Dr Maheboob M Basade

Consultant, Haemato-Oncologist and Stem Cell Transplantation Specialist. He is involved in the surgery

only one in one lakh babies grows up to actually ever need stem cell transplantation. This is statistically documented. However, there's no doubt that stem cells do help in the regeneration of tissues and new cells. Fresh research is being conducted all the time. But it will take a while for the results to be quantified."

KV Subramaniam concedes that the medical fraternity is still coming to terms with this new concept. "Reliance Life Sciences is actively conducting a number of continued medical education programmes that address the whole concept of cord blood banking," he reassures. With regard to what are perceived as prohibitive costs, he offers, "The cost of cord blood banking has to be seen in the context of its potential to treat diseases which, so far, have not had cures. It also needs to be seen with regard to the cost of putting patients on lifetime medical interventions, such as periodic blood transfusions for thalassaemia patients and so on."

Perhaps, at this point, it may be pertinent to look elsewhere. In the USA, for instance, you can either pay to store cord blood in a private cord blood bank for your family's personal use or you can donate it to a public cord blood bank where it will be available to anyone who needs it. Estimates of the chances that individuals or their families will ever need the cord blood they store vary widely, depending on who you ask. In a policy statement issued in early 2007, the American Academy of Paediatrics (AAP) discouraged families from thinking of private storage as "biological insurance" because most conditions that might be helped by cord blood stem cells are already present in an infant's cord blood. Instead, the AAP encourages private cord blood banking when a sibling in the family has a medical condition, such as leukaemia, lymphoma, aplastic anaemia, immune deficiency, sickle cell anaemia, or thalassaemia, which could potentially be cured through a cord blood transplant.

Other experts in the USA advocate private cord blood banking, saying it's worth the investment if you can afford it, especially if you have a family history of diseases that can be treated with cord blood, or if your children belong to an ethnic minority group. They argue that private banking is the only option for most parents, other than throwing cord blood away, because donations to public banks are restricted. The emerging consensus is that private cord blood banking may not be a bad idea in case the stored cord blood comes in handy at some point in the future. Stem-cell research is ongoing, and eventual breakthroughs could make cord blood a more likely lifesaver down the road.

Dr Basade brings in another very relevant angle. "It is important to take a holistic view when it comes to advocating cord blood banking. First of all, it's very expensive to collect at birth. Then, there is a recurring annual cost which is not inconsiderable. Of course, where parents can afford it there may be no issue in banking their infant's cord blood. But administering it in case the child needs it is also very expensive and may not always work. It's also important to establish the long term credentials of the cord blood bank, and to take an undertaking that the cord blood banked will not be sold without the donor family's permission."

KV Subramaniam reiterates, "While the domain of cord blood banking looks attractive for new entrants in the field, one must recognise that this is an initiative that needs long term commitment, ability to invest significantly in state-of-the-art systems and clean room environments. You need the right talent, conformance with regulatory requirements and international accreditations. Cord blood banking is not just about storing cord blood and making it available for future use."

The Cancer Patients Aid Association has been promoting the procedure in India and recently assisted in the transplant surgery of a four year-old, thalassaemic girl, with Rs five lakh. Reliance Life Sciences halved the cost of the cord blood sample and Dr Basade performed the surgery. With more players entering the fray, it is wise to understand the ethical implications of the issue before embarking upon it. Although there is still some ambiguity about whether to bank or not, there is no doubt that stem cells are hitting the right chord. ■

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