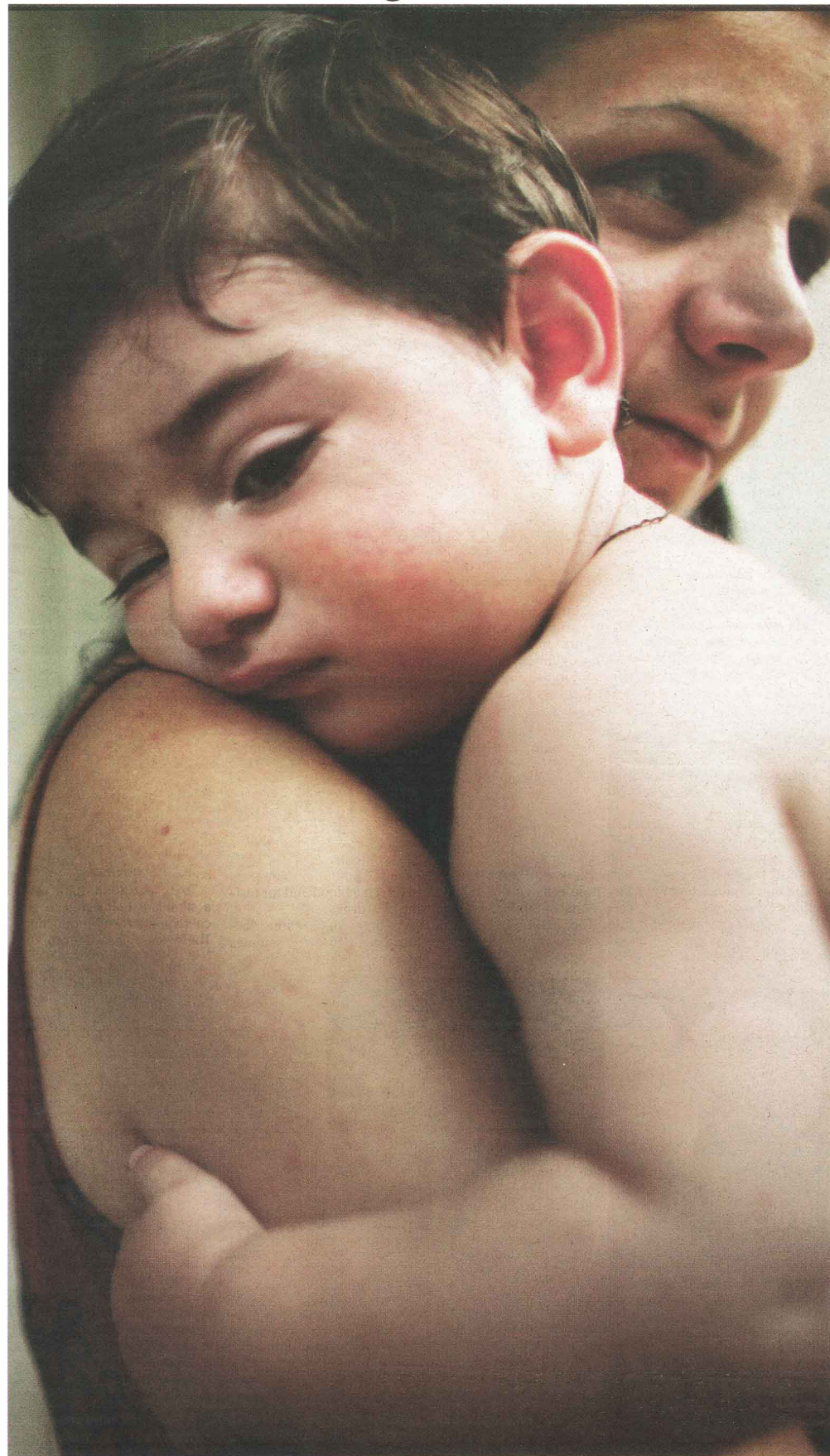


Health&Wellbeing



Glimmer of hope

STEM CELL TECHNOLOGY MAY BE NEW IN MALAYSIA, YET IT HAS ALREADY BEEN PROVEN TO BE A SOLUTION FOR PATIENTS WHO CANNOT BE HELPED BY CONVENTIONAL MEDICINE.

ANGEL was diagnosed with leukaemia when she was just six months old. This form of blood cancer, which is the most common affecting children, causes the marrow to produce too many unhealthy white blood cells. It makes them weak and vulnerable to infections. At that point, her chances of survival was only 10 per cent. She could not undergo chemotherapy because in her weakened condition, the side effects were potentially fatal. All that could be done was to give her transfusions every few days to keep her alive.

In the midst of this crisis, her mother Chong Nyet Moi, 35, found that she was pregnant. She was worried about coping with a newborn and a sick child at the same time, so she enquired about an abortion. Instead of complying with her request, the doctor encouraged her to have the baby. He introduced them to a new procedure where the baby's cord blood could be used to save Angel's life. He also explained that stem cells have been successfully used to help patients recover from chemotherapy and minimise the side effects on their health.

When Angel's parents learnt about this, they were excited. Here was a glimmer of hope for their only daughter. But the RM100,000 price tag on the procedure was way beyond their means. Knowing how much Angel meant to them, friends and family pooled their resources to raise the money.

But even with the cash in hand, the procedure could not be done immediately. They had to wait until Angel's sibling was born. The problem was, Angel's health was deteriorating rapidly. There was a chance that she might not live long enough for the procedure to take place. It was a very long wait. Fortunately, Angel managed to make it to her first birthday and survived the weeks until her brother, Samuel, was born.

But there was still another hurdle to overcome. If Samuel's cord blood was to be transfused into Angel, their blood antigens had to match. Hoping that they would, the

doctors harvested his cord blood at birth and sent it for testing. Thankfully, their HLAs (human leukocyte antigens) matched. This meant that their stem cells were compatible — Angel's body would not reject transfusion of her brother's cells. There was a collective sigh of relief.

Angel was then given chemotherapy, following which she was infused with her brother's cord blood. Injected into her blood stream, it replaced the defective bone marrow which had been destroyed by chemotherapy. With the new cells in place, she started producing healthy red and white blood cells at normal levels. Once her life-giving blood began to behave as it should, she recovered fully, and is now a healthy three-year-old. The little girl might not fully understand the miracle, but her parents are grateful for the technology that saved their daughter's life.

HOPE FOR ATHLETES

Charmaine Brea, 44, is an active athlete. Over the years, her cartilage had worn out, causing a lot of pain in her knees. Conventional treatments and surgery had not helped much, and even mundane activities such as walking and sitting had become torture.

One day, a friend recommended that she consult Dr Saw Khay Yong, an orthopaedic surgeon at the Kuala Lumpur Sports Medicine Centre. At their initial meeting, Dr Saw told her about his work with stem cell therapy. After looking at the case studies and photographs, Charmaine decided to go for it. Asked why she had decided to do it, she replied, "I had nothing to lose. The stem cells are my own."

Adult stem cells harvested from her blood were collected using a machine. Doctors then drilled holes into her bone. This is a conventional procedure to encourage blood flow to help tissues regenerate. Stem cells were then injected into her knee along with the biological matrix that is meant to help rebuild the damaged tissues. The combination of biological



matrix and stem cells grew in her knee and successfully rebuilt the worn cartilage and produced healthy, high-grade tissues. Her knee was as good as new!

Six months after the surgery, Charmaine is training again. She can now run up to 6.5km without any pain, and is planning to repeat the procedure on her other knee. So far, Charmaine is very happy with the results. For those with similar problems, she says, "Go for it. It works."

Active athletes like Charmaine train for long hours, all day, every day. In order to win, they have to work hard to improve their performance. They run, lift weights and practice their sport. Even with preventative measures like warming up and using proper techniques, the amount of stress put on the joints often cause injuries, especially to the knees. Cartilage, ligaments, tendons and bursa may wear out and even tear. Unlike other organs, there is no blood supply to the knees. If something wears out, there is no supply of new cells to repair the damage. Solving this problem hasn't been easy, but stem cells now offer new hope to affected individuals.

STEM CELL TECHNOLOGY

Some medical conditions are too complex to be treated with drugs alone. In these cases, it is the body itself which has ceased to function normally, causing the system to go haywire. Since our body is an enclosed system, a malfunction in one part of the body is likely to affect other organs too. This may cause a range of maladies that vary

from mild to life threatening.

Like the proverbial broken heart, damaged hearts too, have died inside. When a blockage in a heart's artery stops the blood from reaching other parts of the organ, the oxygen-deprived tissues begin to die. The organ will cease to pump blood through the body, causing a myocardial infarction, or what we call a heart attack. If the victim is saved, he or she is likely to be left with a damaged heart which may attack again or develop heart failure, a condition where the heart becomes too weak to pump blood effectively. A damaged heart takes a long time to heal and leaves its owner vulnerable to further attacks.

Thanks to stem cell technology, these patients can now be helped. Stem cells have been used to repair damaged hearts by introducing them via the artery. They encourage new cell growth and replace dead tissues, allowing the heart to function normally once again.

HOW IT WORKS

Most drugs reduce pain, control infections or prevent inflammation. Some contain hormones to regulate an imbalanced system. But at the end of the day, it is our body

that will need to heal itself by fighting infections and repairing damaged tissues. Stem cell or regenerative therapy sends stem cells where they are needed most to effect repairs to damaged areas.

There are various other ways that stem cells have been harnessed to regenerate good health and alleviate suffering. For example, diabetes Type I sufferers cannot metabolise blood sugar like normal people do. Their pancreas no longer produces insulin, which converts sugar in the blood into energy to fuel activities we take for granted like walking and lifting. Without insulin, victims have no energy and are vulnerable to health complications from the extra sugar in the blood. To help them regulate their blood sugar, they will need to inject insulin into their system. This has to be done each and every day for the rest of their lives.

Stem cells can now be used to protect the insulin producing cells from being attacked, and to repair the damaged tissues so that they can produce the hormone normally, eliminating the need for cumbersome and expensive daily injections.

Due to poor blood



A newborn baby boy lies beside his mother at Beijing Chuiyangliu Hospital in Beijing, China. Umbilical cord blood has been collected from him to be used to try and cure his leukemic sister

circulation in the feet, diabetics are prone to foot ulcers which are unable to heal, leading to gangrene and often, amputation of the affected limb. Stem cells infused into diabetic ulcers help new cells and blood vessels to grow, allowing the ulcer to heal.

ABOUT STEM CELLS

Stem cells are special cells which are produced in the bone marrow and circulated through our bloodstream to all parts of our body. Imagine these cells as the 'magic repair kits' of our body. They have the ability to change from a standard stem cell into a specialised cell, such as muscle, or skin, wherever they are required. They are 'clever', because they know, based on the hormones and other clues around them, what they are supposed to do. Plus, each cell is able to replicate itself, so we don't need to inject a lot of them to fix damaged tissues in our body.

And how's this for a bonus? Because stem cells promote growth of new cells, they can be used in facial treatments to reduce wrinkles and return youthfulness to the skin!

Because the stem cells are unique to a person, they will not cause organ rejection in patients. However, the limitation of stem cell therapy is that it is specific to the donor and sometimes, their siblings. Chances of stem cells matching other people, even parents, are slim. It is possible to find an unrelated donor in stem cell banks worldwide,

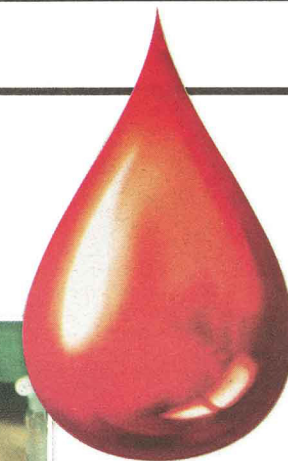
but it is a difficult task, and also very expensive.

Colin McGuckin, professor of regenerative medicine at Newcastle University is a globally recognised authority in the field of stem cell research and tissue bio-engineering. According to him, the latest stem cell technology currently being investigated is growing liver cells in petri dishes and weightless chambers. Although it is not likely that they can replace the whole organ, these cells have the potential to be used in filtering blood and for testing new drugs.

As early 1939, some doctors began to store samples of cord blood because they figured that it might come in handy someday. True enough, up to 80 conditions have been found to be treatable with stem cell therapy. A lot of research is being done in this field, and there is hope to cure illnesses like Parkinson's disease in the future.

This therapy is an up and coming option for people whose needs go beyond conventional medical help. While it is not a cure all solution, and cost of treatments can be expensive, it has shown very promising results.

A stem cell bank offers banking and therapeutic services to its clients. It is responsible for safe storage of the cells in a certified cryogenic facility. The storage fees for this facility are as low as RM250 per annum for cord blood and RM1500 for adult stem cells. For more information on Malaysia's only stem cell bank, log on to www.StemLife.com.



How do we get the stem cells for therapy?

Baby's cord blood

Cord blood is blood found in a baby's umbilical cord. Only 20ml to 100ml is taken after birth. The blood is usually discarded together with the placenta, so there is no ethical or health issues to the mother or baby. Stored cryogenically in a stem cell bank, it can be kept indefinitely in case any medical condition crops up. They can also help a sibling, provided that the HLAs match.

Harvested from the blood

Previously, harvesting stem cells involved a painful procedure of drilling and extracting the marrow from the spine. Thank goodness there is a painless alternative now.

To collect adult stem cells, a stimulant is injected to encourage stem cell production. These are released from the bone marrow into the blood system and collected using a machine similar to those used for dialysis. The process takes only a few hours and the collected cells can be used directly for therapy. They can also be processed and stored cryogenically in a stem cell bank.



● Taken from this month's Her World magazine