

Banking on cord stem cells

The Straits Times : Saturday, September 1, 2001
by Andy Ho (senior writer with The Straits Times)

YOUR newborn's belly button is something you should contemplate seriously right now.

More precisely, the foetal blood in your newborn baby's umbilical cord and the placenta after delivery.

At birth, the umbilical is usually discarded along with the placenta.

But that cord blood holds haematopoietic stem cells - precursor cells that give rise to mature blood and immune systems, which may someday save the child's life, a sibling, or even some stranger.

Each of these stem cells can divide and develop into different types of cells that make up blood until all the necessary components are present.

Expectant parents can now bank the blood after delivery.

A private firm called Cordlife will collect the blood and dispatch it immediately for storage in Japan or the United States, for a fee.

It was incorporated in April by venture capitalists, including some National University of Singapore (NUS) academics. Its head honcho, Mr Steven Fang targets a regional client size of 1,000 by year's end.

Or you could donate cord blood to a bank run by World Health Organisation (WHO) at NUS, from which patients may obtain matched cells from an unrelated donor.

People with diseases in their immune systems, such as acute leukaemia or aplastic anaemia, whose blood cells are not functioning correctly, or are not present at all, are potential recipients of this blood.

Autologous or the common blood transfusion offers only temporary relief as its mature cells have limited life spans.

Bone marrow transplants may also help as marrow stem cells can proliferate into whole blood, but they are much more mature than those in cord blood, and so require a closer match than cord-blood stem cells.

If a child's cord blood is preserved, however, and if he ever requires a bone marrow transplant, the costly and time-consuming search for a suitable donor ends right there: cord-blood stem cells when transfused will later reside in the bone marrow and immune cells.

And these cord-blood stem cells are self-perpetuating, thus providing a replenishing source of normal cells.

So transfusion of cord blood may provide a means to permanent (or long-lasting) recovery.

Moreover, collection the blood is painless for mother and child, whereas marrow donors must undergo anaesthesia and painful surgery in order to harvest their marrow.

That is, if your search for a genetically-matching marrow donor, a time-consuming search for a needle in a haystack, is successful.



Stored cord blood, on the other hand, is readily and quickly available.

With such promise, Cordlife clones may be in the offing, offering to collect and cryo-preserve cord blood right here.

However, an open market for private storage not only raises various legal and ethical issues, but may also not be economically or socially the most efficient solution.

Legally, once people can maintain a private, limited store of potentially valuable substance, property disputes are certain to arise.

True, when a layman is asked if he has a right to his own blood, organs or body in general, he would almost certainly reply: "But of course!"

A lawyer would be less certain. After all, patients have traditionally not claimed ownership of tissue or blood samples taken during medical treatment.

Yet, who owns the stored cells will be an important question when conflicts between the storage facility and the family arise.

For example, after an initial processing charge of between \$2,000 and \$4,000, Cordlife charges a yearly maintenance and storage fee of \$200.

What happens if a family fails to make its yearly payments? If forfeited, does the donor family have any residual right to control a subsequent sale?

Some of these conflicts could be avoided by contract agreements, of course, as to how the blood is to be disposed in the case of non-payment of fees.

Cordlife does not allow sale, and destroys the banked blood for nonpayment of fees.

Ethically, would it be right for Cordlife to destroy the blood for non-payment even if legal, or for parents to donate a child's privately-stored cord blood to a sibling or another person when the donor is underaged to make the decision?

For the amount collected is sufficient for only a single transplant for one child.

You can donate a kidney only once in your life and you would have one left, but if your cord blood is destroyed or given away, there are no spares.

And just as kidney donor runs a small but perpetual risk that the remaining kidney might fail, the cord-blood donor has 1 in 2,500 risk of a blood cancer, that is leukaemia, lymphoma or myeloma, that may be treated with his own cord blood.

So should parents be permitted to give one child's cord blood away, even to a sibling?

While parents can generally give consent for medical intervention to their children, a move that does not benefit the child donor means that consent by a parent may be insufficient for physicians to proceed.

For in the emotional circumstances surrounding serious illnesses, a parent or guardian may not be able to balance fairly the rights of the healthy child donor against the desperate needs of an ill child.

In that situation, the prudent physician would urge parents to petition a court for authority to proceed, as they have done in analogous American cases of kidney or bone-marrow donations by mentally-incompetent or underage individuals.

Economically, the scale of the storage problem is quite staggering.

For every 200,000 placental blood units stored, experts estimate that, at most, 75 units might "possibly" be used by patients who require a transplant.

Socially, patients in need of a blood stem cell transplant but who do not have their own store of umbilical cord blood - like you and me - and unable to find a bone-marrow match are ill served by a system composed entirely of privately maintained cells.

A public bank to which parents donate cord blood to be stored for anyone's use according to need cuts and the legal, ethical, economic and social Gordian know neatly.

This is not to say private banking should be disallowed.

Some families who can afford to pay will clearly choose private storage, for example, when there is a family history of childhood leukaemia.

But public banking can provide this valuable treatment to many more people in the most economic and ethically-palatable fashion.

Which is why the seriously underfunded facility at NUS deserves public support.

The next time you wash your baby's belly button, or your own, you may want to mail them a cheque.

#