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From bad blood to good: Cord blood stem cells at work

The love and care of parents may be said to have no limits, but all of them would rather want their children to be healthy. No parent would want the heartbreak caused by seeing their children suffering from diseases, especially more complex and life-threatening ones, such as blood-related cancers and blood disorders. There are a variety of treatments for such life-threatening diseases, one of which is hematopoietic stem cell transplantation.

Cord blood and blood-related cancers

Cord blood stem cells, for one, are widely utilized in stem cell transplantations because of the hematopoietic stem cells (HSCs) that are derived from umbilical cord blood. HSCs, also found in bone marrow, replenish blood, regenerate the immune system, and can differentiate into red blood cells, white blood cells, and platelets. This is why blood-related cancer patients sometimes receive HSC transplantation after chemotherapy and radiation therapy, which otherwise kill healthy blood cells.

Blood-related cancers include Leukemia, Hodgkin's Lymphoma, Non-Hodgkin's Lymphoma and Myeloma. Leukemia is the most common childhood cancer worldwide, as well as in the Philippines.[1]

At birth, cord blood can be collected via a simple extraction from the vein of the umbilical cord. The cord blood stem cells used for stem cell transplantation may come from the patient's sibling, medically also known as allogeneic use, or from the patient himself, known as autologous use.

Case 1: Cord blood to the rescue

In 2001, Ryan Foo was suffering from leukemia at a tender age of three. Despite a nationwide search for bone marrow stem cells in Singapore, a suitable donor could not be found. Fortunately, baby sister of Ryan, Rachel, was born during that critical period, and her cord blood was collected, processed and stored prior to being used for Ryan's transplantation in Singapore in 2002. It was a blessing that Rachel was a perfect match to Ryan. Ryan has been in remission ever since.

Here in the Philippines, stem cell transplantations are performed at key tertiary medical institutions, such as St. Luke's Medical Center. According to the *Philippine Journal of Medicine*[2], in 2005, a cord blood transplant was performed at St. Luke's, the first of its kind in the Philippines, for a nine-year old female patient suffering from acute myelogenous leukemia following a relapse. It took a year to find a suitably matched cord blood unit from a public cord blood bank in Japan.

Cord blood and blood disorders

HSCs are also being utilized to treat blood disorders, such as thalassemia, aplastic anemia and sickle cell anemia. In the case of thalassemia, it is an inherited blood disorder that affects one's ability to produce hemoglobin, the protein in red blood cells that carries oxygen and nutrients to the body.

According to the United States National Human Genome Research Institute (NHGRI), an estimated 100,000 babies around the world are born with severe forms of thalassemia yearly.

People with thalassemia can be completely cured by bone marrow transplants. However, the NHGRI says only a small minority of patients who have suitable donors can avail of it because of the risk involved, which could result in death.

Case 2: Cord blood as lifesaver

Moinam Pal from India is an example of how cord blood stem cells can be an effective treatment for thalassemia. When he was barely a year old, Moinam was diagnosed with thalassemia, known to take the lives of most children before they become 10 if left untreated.

The cord blood stem cells of Moinam's newborn sister were also a perfect match to Moinam. Since the HSC transplantation in 2011, Moinam has fully recovered. .

"The case of Moinam is proof of how powerful cord blood stem cells are, and its life-saving benefits," said Dr. Arvin Faundo, medical director of Cordlife Philippines.

Preparing for eventualities

Ryan's and Moinam's stories are only two of the many success stories of Cordlife Group Limited. The Group — which Cordlife Philippines is a wholly-owned subsidiary of—have released cord blood units to successfully treat various life-threatening diseases globally, including Moinam's and Ryan's.

In the local setting, Cordlife Philippines offers Filipino parents the choice to save their baby's cord blood through its cord blood banking service, in case of medical treatments he/she or a sibling may need in the future.

"Through cord blood banking, the parents have the option to utilize the cord blood stem cells to save a child's life when such eventualities occur," Dr. Faundo said.

In February 2010, Cordlife Philippines officially opened the country's first and only ISO9001:2008 certified cord blood processing and storage facility to better serve the Filipino families, who now have more flexible banking options for their baby's cord blood — in any of the Cordlife's facilities across Asia. Cordlife Philippines is also registered with the Department of Health.

Located in UP-Ayalaland Technohub in Quezon City, the local facility has a storage capacity of more than 20,000 units, and uses liquid nitrogen for long-term cryopreservation. The highly-secure world-class facility operates 365 days a year and offers the world's only fully automated cord blood processing system, SEPAX.

In February 2013, Cordlife Philippines introduced its newest line of service – umbilical cord tissue banking using CellOptima, an advanced technology for stem cell isolation. Developed and patented by Singapore-based clinician-scientists and exclusively available at Cordlife, the technology can isolate and expand epithelial stem cells and mesenchymal stem cells from the umbilical cord lining, giving families more medical options in the future.