SUMMARY

Stem cell is defined as an undifferentiated cell that has continuous proliferative ability. Additional characteristics include the ability to repopulate a tissue or organ after transplantation and the potential to be serially transplanted.

The ***stem cells*** nowadays carry a great hope for many diseases that before were thought to be non-curable one. The study of hematopoietic stem cells is one of the most exciting and rapidly advancing researches in the medical field today. HSCs will be one of the most powerful tools for healing.

The selected source of stem cell depends on the type of the disease and availability of cells. Stem cell transplantation used to replace and/or repair the damaged tissue in the new host.

Hematopoietic stem cells were obtained from bone marrow, peripheral blood hematopoietic stem cells, and umbilical cord hematopoietic stem cells, these sources have proved to be the effective sources of SCs.

Other alternative to HSCs, are fetal liver stem cells and human embryonic stem cells. While Mesenchymal stem cells and neural stem cells are considered as a non HSC sources.

Mesenchymal stem cells (MSCs), the progenitors of all connective tissue cells, are multipotent cells present in a variety of tissues during

human development. MSCs, used as an alternative source for human transplantation and are one of the promising medical hopes in the near future.

The liver is one of the most important organs in the human body, being responsible for functions such as excretion of waste products and drugs, synthesis of plasma proteins necessary for blood clotting, excretion of bilirubin and storing multivitamins.

The liver owns the ability for regeneration and both hepatocytes and stem cells within it are able for repairing its injury.

The stem cells aim to regenerate new functional liver units and treat diseases such as acute and chronic liver disorders as well as various metabolic liver disorders.

In recent years the interest in "liver cell therapy" has been increasing continuously, since the demand for whole liver transplantations in human beings far outweighs the supply

The procedures of injection of HSCs were variable. The cells can be injected in the portal vein, or the hepatic artery. If the liver architecture is deranged, cell infusions may cause prolonged portal hypertension and embolization in the lung. Therefore, ectopic sites for engraftment are needed. The best studied ectopic site is the spleen. Direct intrasplenic injection may be a feasible strategy to support patients with deranged liver architecture.

HSCT has severe adverse reaction such as infections (viral, bacterial and fungal) due to neutropenia, GVHD, liver affection, endocrinal complications and recurrence.