NEURODEGENERATIVE CONDITIONS PROTOCOL

PRELIMINARIES

Background:. Neurodegenerative diseases (NDs), such as Alzheimer's disease, Huntington's disease, and Parkinson's disease are characterized clinically by their subtle onset but chronic progression and involve the degeneration of defined neuronal phenotypes in the central nervous system (CNS).[1].
In recent years, numerous studies have shown that stem cell transplantation elicits neurogenesis and angiogenesis by releasing neuroprotective factors brain- derived neurotrophic factor (BDNF) and nerve growth factor (NGF). [1,4] Results have provided proof of principle that cell replacement can work in humans with Parkinson's disease, [4]however here are still many obstacles to the use of stem cells as a cure for neurodegenerative disease, especially because we still don't fully understand the true mechanisms of these diseases and clinical data is still scarce.

TREATMENT OPTIONS:

Despite substantial research and the development of a number of neuroprotective drugs to treat NDs and to improve patient survival, no effective therapy for these diseases is currently available.

MONONUCLEAR LAYER CORD BLOOD PRODUCT TREATMENT OPTION :

Concentrated human stem cell product comprised of donated cord blood, that has been processed to remove excess plasma, red blood cells, vascular material and tissue solids leaving stem cells and other cellular components, which are then concentrated and banked through a validated process.

a. **Objective:**
   Therapeutic approaches involving the transplantation of stem cells focuses primarily on the replacement of lost neurons and the restoration of neural tissue structure. UCB cell-induced neuroprotection involves anti-inflammatory and immunomodulatory effects, and that neurotrophic factors act through paracrine and/or autocrine interactions between transplanted UCB-derived cells and the neural microenvironment.

b. **Patient management:**

- Initial patient evaluation: Reviews the medical information, lab work, and diagnostic imaging provided by the patient in order to determine the stage of the medical condition and any other secondary conditions. Application and scoring of the quality of life questionnaires appropriate for specific condition. (PDQ 39/SF36 etc)

- Patient consultation. Informed consent is obtained from all patients and medical records are updated, including patient's most recent physical exam, medication history, most up-to-date lab results and imaging studies.

- Treatment day:

    - Premedication infusion protocol is started one hour before product application.

    - Benadryl 25mg IM, Zantac 200mg IV, Solumedrol 125mg IV. Single Dose.

    - Attach certificate of analysis to patient's chart.

    - Place the bottle in the palm of your hand until product is in a complete liquid form which can take about 3-5 min.

    - Swab the outside of the vial with alcohol, then remove the sterile cover and draw the contents into a syringe using aseptic technique.

    - Injection will performed using sterile technique, per specific protocol consistent with the condition to be treated. Sample should be injected within 2 hours of thawing.

    - Neurodegenerative conditions require a dose of 2 million cells/kg of body weight. Recommended route of administration is via arterial catheterization, stereotactic delivery or intrathecal injection. Intravenous route has proved to be less effective in neurodegenerative conditions.

    - Product should not be mixed with any other biologic compound.

c. Risks:
There are possibilities for unwanted effects related to the injection of stem cells. Even with the most established protocol, adequate technique, and careful administration; a medical team may encounter uncontrollable events. Although there is no guarantee of perfect results, excellent results can be attained.

The risks of complications with the administration of cord blood products are very low. Possible risks include but are not limited to:

- Pain at site of injections
- Malaise
- Fever
- Allergic reaction

d. Outcomes:
Cell therapy potential to ameliorate symptoms and slow down the progression of the condition.

e. Follow Up Plan:

- *Pre-implant:* Complete neurological examination/ report by neurologist. MRI, Quality of life questionnaires.

- *3 months after implant:* Complete neurological examination by unrelated neurologist. Quality of life questionnaires.

- *6 months implant:* Radiological examination, neurological examination quality of life questionnaires.

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