NEUROPLASTICITY AND ALOE VERA

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INTRODUCTION

• Aloe Vera (*Aloe barbadensis* Mill) has the capacity to modulate pro-inflammatory process and excite neuro regeneration through its adaptogenic properties. These properties could contribute to the replacement of lost cells in the dopaminergic pathway as in Neurodegenerative brain diseases such as Parkinson's disease - Neuroplasticity
METHODS

• Plant Characterization and Identification
• Plant Collection and crude Anthraquinones extraction
• Preparation of crud Anthraquinones [AQS] to salting out
• Preparation of alcohol/salt Aqueous extractions
• whole blood samples are induced with ROS specie (Lab mice) to excite inflammation and production of cytokines.
• clinical observation (behavioral pattern of the lab mice) and laboratory evaluations (the cytokines of inflammation should be detected in CSF).
RESULTS

• Concentration of Aloin extract [100, 200 and 400 µg/ml or more] would be added in the whole blood. Therefore, three cultures should be set-up for each subject:
  • Culture Number 1: Blood culture of [Healthy no ROS specie Tissue/lab mice] treated with 100 µg/ml of Aloin extract.
  • Culture Number 2: Blood culture of [Healthy and ROS specie cultured nerve tissue/lab mice] each treated with 200 µg/ml of Aloin extract.
  • Culture Number 3: Blood culture of [Healthy and ROS species/ culture nerve tissue or lab mice] each treated with 400 µg/ml of Aloin extract.
  • Culture Number 4: untreated culture (negative control)
RESULTS

- After 72 hours incubation, the culture tubes should be centrifuged [800 rpm] for 5 minutes, and then the supernatant discarded and the cell deposit gently suspended in 5 ml of a warm [37°C] hypotonic KCl solution [0.1M]. The cell suspension incubated in a water bath [37°C] for 30 minutes with a gentle mixing every 5 minutes. Then, the suspension centrifuged [800 rpm] for 5 minutes again.

- ROS Species formation:
  - Untreated Cultures: There should be no reaction whatsoever.
  - Cultures Treated with Three Concentrations of Aloin Extract: Elicited inflammation leading to the release of cytokines and further macrophage activity by the Aloin would be observed both in the whole blood sample and Nerve tissue.
IMPLICATION OF RESULTS

• I – Was there any inflammation generated once ROS species were introduced into the blood samples

• II – Was Inflammation present in the Nerve tissue, once introduced into the lab mice, and CSF fluid collected, was there presence of Cytokines ? Based on clinical evaluation, was there any change in behavior of lab mice after cytokines were introduced into the substantia Nigral pathway

• III – Once blood sample and Nerve Tissue was treated with Aloin extract, was there any observation i.e reduction in the amount of cytokines produced, was there presence of Fibroblast growth factors. Was there a correlation between the amount of Aloin extract added and the amount of fibroblast produced

• IV – Did Aloe Vera gel inoculation (Aloin) cause proliferation of fibroblast cells was any reversal in the inflammation or Neurogenesis noted after fibroblast appeared
DISCUSSION

• The concept of Neuroregeneration in Parkinson Disease includes Neurogenesis, Neurorestoration and Neuroprotection. It has been proven that, mammalian brain has neurogenetic abilities in the subventricular zone and subgranular zone of the hippocampal dentate gyrus.

• Aloe Vera is has proven adaptogenic properties. It possesses Lignin for deep penetration into tissues. This feature could potentially allow for deep penetration of the oxidation modulatory properties of Aloe Vera in brain tissue and thereby influence processes during Neurogenesis. In addition to vitamin B12, folic acid and choline aloe extracts also contains vitamins A (beta-carotene), C and E that can neutralize free radicals. Additionally, acemannans in these extracts stimulate the activation of macrophage (glial cells?) that could help in clearing deleterious ROS from brain tissue with salicyclic acid in these extracts subsequently able to modulate inflammation.
The combined action of these compounds in Aloe extracts may reduce ROS production thereby modulating local inflammatory damage via multiple pathways. The excitation of neural cell growth may be caused by the polysaccharides in Aloe extracts through nervous system cytokines such as; Nerve growth factor (NGF), Brain derived Nerve factor (BDNF), Glial Derived Nerve Factor (GDNF). These cytokines could contribute to replacement of the lost cells in the Dopaminergic pathway as seen in neurodegenerative brain diseases such as Parkinson's disease - Neuroplasticity. This proposed study would establish the potential pharmacological benefit of Aloe Vera extracts in the management of neuro-degenerative conditions.
SUMMARY OF POINTS

• Aloe Vera (*Aloe barbadensis* Mill) has the capacity to modulate pro-inflammatory process and excite neuro regeneration through its adaptogenic properties.

• The mammalian brain has neurogenetic abilities in the sub ventricular zone and subgranular zone of the hippocampal dentate gyrus with Aloes, deep penetrating lignins, oxidation modulatory properties of Aloe Vera can attain deep brain tissues and excite Neuroregeneration and eventually Neuroplasticity.

• Additionally, it is organic- less risk of adverse reactions in short or long term use, it is easily accessible and cost effective.