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Erika Melman

e_k_melman@yahoo.com

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Neurologic Remediation Post Ischemic Stroke: An Integrated Literature Review

Erika Melman, MSN-RN
DePaul University, NSG598: Graduate Research Synthesis

To date, tissue plasminogen activator (tPA) is one of the only FDA approved treatments for patients presenting with symptomatic ischemic stroke. The narrow therapeutic window range of 3 – 4.5 hours poses a serious set-back in recovery and neurological remediation rates. Furthermore, the vast majority of stroke patients cannot get access to treatment within the narrowly defined time limits. Beyond the acute time period, there is evidence that physical rehabilitation focused on the injured area is effective. However, neurological recovery with physical rehabilitation is rarely complete.

Methods

An integrative literature review was used to assess and report on current stroke therapy effectiveness and possible reported alternative therapies for the purpose of decreasing the degree of irreversible neurological damage sustained from tissue ischemia during an ischemic stroke. After research articles were compiled and inclusion/exclusion criteria was applied, five articles were deemed to have sufficient evidence to be included in this literature review.

Conceptual Framework

In this review, the four constructs of the Health Belief Model – initial threat to health, cue to action, perceived benefits outweighing barriers/risks and undertaking of preventative action have guided the entirety of this project in design, reporting and evaluation of the current standards, knowledge and treatments ischemic stroke (see below).

Suggested Therapies

- Stem Cells
  - Suggested in the use of neuroregeneration post stroke by replacing the cells that have died with stem cells to replicate and function as human cells
- G-CSF
  - Endogenous stem cells – studies suggest improved neurological remediation and reduced damage to brain tissue
- Citicoline
  - Endogenous stem cells – may inhibit ischemic cascade and increase neuroplasticity
- Mild Hypothermia
  - Salvage or post-pone damage to compromised brain tissue
- Tenecteplase
  - Genetically mutated form of tPA – longer half-life with more fibrin specificity = faster clot lysis with less bleeding

Conclusions and Future Direction

tPA is an inadequate treatment for stroke. The narrow therapeutic window of tPA does not allow for timely reperfusion in turn hindering the possibility of neurologic remediation. While there are other treatment modalities available for use today, they are under-utilized in the hospital setting to date. There are multiple suggested treatment modalities, both pharmacologic and non-pharmacologic that have shown promise in areas such as physically treating the occlusion and increasing neurologic function post stroke. These treatment modalities need to be researched more in depth. Current clinical trials being run on alternative therapies such as stem cells and new pharmacological interventions that seem to show promise in increasing neurologic functions post-ischemic stroke. Hopefully, through research, clinical trails and new medical advances, new treatment modalities that will increase the rate of recovery post-stroke and decrease the damage done to brain tissue is in our near future.