Neuromuscular Signaling in Myasthenia Gravis Patients
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BACKGROUND
Currently, no one treatment method has been identified as the prime choice for treatment of neuromuscular junction disorders. The study will take a qualitative and quantitative approach to help with answering the main question of the limitations and barriers associated with physician selection of innovative treatment for neuromuscular junction diseases. The study examined a pool of global literature from various studies on NMJ. It also utilizes the data scaled against current studies to draw a valid conclusion on barriers associated with physician selection of innovative treatment for neuromuscular junction diseases.

PURPOSE AND HYPOTHESIS
The study will take a qualitative and quantitative approach to help with answering the main question of the limitations and barriers associated with physician selection of innovative treatment for neuromuscular junction diseases.
• It is known that botulinum toxins (most often type A) impair diaphragmatic function by interfering with the release of acetylcholine into the neuromuscular junction.

RESEARCH QUESTIONS
Qualitative Questions
1. Why is the neuromuscular signaling process affected by disease?
2. What type of neuromuscular signaling affects the disease process?
3. What are the properties of neuromuscular signaling affecting the disease process?
4. What association does myasthenia gravis have on the neuromuscular signaling process?
5. Does EPP affect the process of disease?
6. Does the motor end plate play a significant role in the disease process?

Quantitative Research Questions
1. What variables of neuromuscular system affect the dysfunction of the disease process?
2. How prevalent are neuromuscular signaling diseases among patients in the United States population?
3. Is the issue endemic to a specific group of people?

HYPOTHESIS
Myasthenia Gravis of Neuromuscular signaling dysfunction needs the integrated qualitative and quantitative approach analysis that will lead to effective individual patient therapy.

MATERIALS AND METHODS
• Myasthenia gravis (MG) is one of the most common disorders of neuromuscular signaling. The prevalence of MG is 13 to 21 per 100,000 cases in the United States.
• The symptoms experienced by people with MG include muscle weakness and generalized fatigue. In healthy patients, the presynaptic terminals release acetylcholine (Ach) from the motor nerve terminal in quanta. The Ach diffuses across the synaptic cleft and connects to receptors on the post synaptic membrane of the muscle that causes depolarization and muscle contraction. The post synaptic membranes (Ach receptors) are destroyed mostly due to immunological or genetic abnormalities.
• Thymic tumors are commonly seen in patients with MG. B-cells interact with helper T-cells to produce antibodies in the thymic gland. The destruction of the thymus’ tolerance can cause an immune attack on the Ach receptors. MG can be treated with cholinesterase inhibitors such as neostigmine bromide or by surgical treatment such as a thymectomy.
• This study utilizes a Meta-analysis approach for data interpretation to compare neuromuscular signaling on MG patients who are treated with cholinesterase inhibitors versus those who are treated surgically.
• Furthermore, this study intends to show that neuromuscular signaling in MG patients who have had surgical interventions have better outcomes. In our study we include biophysical noninvasive diagnostics and electrocortical neuromuscular stimulation as an alternative diagnostic therapy.

RESULTS
The results of this pilot study were as follow:
1. Qualitative analysis shows that thymectomy was more effective than cholinesterase inhibitor agents.
2. Quantitative analysis shows 67% of patients who perform the surgery have better outcomes than those who use cholinesterase inhibitors drugs.

CONCLUSIONS
• The pilot study was based on meta statistic analysis.
• This study utilized a meta-analysis approach for data interpretation to compare neuromuscular signaling on MG patients who are treated with cholinesterase inhibitors versus those who are treated surgically.
• Patients who have had surgical interventions have better outcomes.

BIBLIOGRAPHY
• References:
  - Einstein, George P.; Echavarria, Louis and Tulp, Orien L.; Application of Einstein Matrix Medical Treatment for HIV/HCV therapy; The FASEB Journal, April 2013 (688.4)