Sample Research Elective Application Proposal and Plan

Name of Student:
Year:
Dates of Elective:
Research Mentor Name and Affiliation:

Background and Significance

Stroke is the fifth leading cause of death and the leading cause of severe long-term disability in the United States[1]. The symptoms as well as the causes are variable; therefore, strokes are classified into 3 subtypes: subarachnoid hemorrhage (SAH), intraparenchymal hemorrhage (IPH), and ischemic (IS). Ischemic strokes, also known as cerebrovascular accidents (CVA), are by far the most common subtype, representing about 87% of all strokes[2]. The typical presenting symptoms of an IS include acute hemiparesis, hemiplegia, and/or hemi-sensory loss among others[3]. The initial diagnosis of ischemic stroke relies heavily on history, neurological examination, and neuroimaging (CT or MRI). Clinical presentation typically entails an abrupt onset of focal neurological signs and symptoms which can be localized to a specific cerebrovascular territory. However, correctly diagnosing IS is not always an easy task as there are many conditions which mimic the typical IS presentation.

In patients with an IS, it is the first 3-4 hours that are the most crucial in terms of diagnosis and treatment. Within minutes after a cerebral blood vessel becomes occluded a central area of irreversible infarction is created. This area is called the “core.” The core is surrounded by another area of potentially reversible infarction called the “ischemic penumbra.” It is this penumbral region of the lesion which is salvageable if adequate perfusion is restored. Currently, the most effective method for accomplishing this is the administration of an intravenous thrombolytic agent. However, treatment must be given promptly as the benefit of intravenous thrombolytic therapy progressively decreases with time following symptom onset. Meta-analysis of several randomized controlled trial’s investigating thrombolytic therapy has shown that the risks of administration begin to outweigh the benefits after 3-4.5 hours.[4] Therefore, treatment must be given as soon as possible, rather than near the end of the time window.

The burden of diagnosing IS typically falls on the shoulder of ED personnel as this is the where patients with an acute IS most frequently present. However, as previously stated, the symptom picture in an IS can vary greatly from case to case. This is further complicated by IS mimicking conditions, such as transient ischemic attack (TIA), postictal seizure states, hypoglycemia, and demyelinating disorders. These “stroke mimics” have a large potential to be misdiagnosed and incorrectly treated with thrombolytic therapy[5-7], which may result in unnecessary risk to patients and increased cost[8,9]. This is one of the reasons many healthcare systems have assembled groups of healthcare professionals who are specially trained in stroke treatment and recognition. Stroke teams are available 24 hours a day, and are activated upon suspicion of stroke. A typical team consists of nurses and neurological specialists trained in acute diagnoses and management of stroke. Since their creation and implementation, stroke teams have been shown to reduce the likely of death from IS by 14%.[10]

In this study, we seek to quantify the degree of concordance between ED diagnosis and the final discharge diagnoses of ischemic stroke as made by the ED physician and neurologist, respectively. In doing this, it is our hope to determine the frequency at which inappropriate activation of the stroke team occurs.

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Study Objectives

The key outcome measures are the final discharge diagnosis, the clinical characteristics of the initial ED presentation, previous history of TIA or CVA, and the use of thrombolytic therapy.

1) Correlate the admitting diagnosis of CVA from the ED with the final discharge diagnosis from Neurology

2) Distinguish stroke mimics and their typical presentation to the ED

Research Design and Methods

Retrospective, cohort analysis to correlate the ED diagnosis of CVA based on the stroke team activation protocol with the final discharge diagnosis for the patient. Specific parameters such as clinical characteristics of stroke mimics will also be recorded as well as frequency of thrombolytic therapy use in the ED. All patients 18 or older seen at [Name of Hospital] at from January 2011 to December 2012, for which the stroke team was activated at presentation will be analyzed.

Demographic information, clinical findings, and laboratory results will be obtained from ED records using appropriate safeguards to protect patient confidentiality. Medical records will be reviewed by one research assistant trained using a set of ‘‘practice’’ medical records. One of the investigators [mentor name] will meet frequently with the abstractor to resolve questions. Our intent is not to analyze how clinicians decided to activate the stroke team, but rather, quantify the correlation of the ED diagnosis with the final neurology discharge diagnosis based on clinical presentation.

Patients whose discharge diagnosis of CVA matched that of the ED diagnosis will be termed *concordant patients*. Patients whose diagnoses did not match will be termed *discordant patients*. The clinical features of these two groups will be analyzed and compared with the later diagnosis being termed a *stroke mimic*. Application of thrombolytic therapy will also be analyzed based on its numerous side effects and time sensitive efficacy.

Student’s Role in Research

I will be playing a major role in the data abstraction and data analysis portion of this study. I will extract the required data from medical records and enter them into the data collection sheet. I will prepare data for analysis by the statistician. I will create the necessary figures and graphs to prepare the project for writing. I will write the project for publication and be the first author. I will be working on this project prior to the start of the research elective, and will continue to work on this project past the end date of the research elective.

Learning Objectives

In this study, I will gain an understanding on the data collection and data protection process of clinical research, since data collection involves private health information. I will also learn the process of delivering raw data to a statistician such that analysis can take place. I will gain a better understanding of biostatistics as they relate to this project. Finally, I will learn research communication skills by preparing results for presentation and/or publication.

References

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