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**Implementation of the Centor Score in the Assessment of Pharyngitis in an Atypical Setting
During a Pandemic**

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Abstract

Pharyngitis is a self-limited illness. Antibiotics are indicated if group A streptococcus (GAS) is present, yet 60% of patients receive a prescription. Implementation of the Centor Score at the time of triage can lead to appropriate collection of a rapid strep test (RST). Centor Scores were completed on adult patients presenting for an RST during the COVID-19 pandemic at a drive-up testing site. All five patients who had an RST had a negative GAS result and did not receive an antibiotic. A Centor Score completed at the time of nursing triage can provide guidance related to antibiotic prescribing for pharyngitis.

Keywords: RST, pharyngitis, GAS, group A streptococcus, Centor

Pharyngitis is a self-limiting illness, typically benign in nature, yet represents about 12-million visits per year or 1-2% of all ambulatory care visits in the United States (Harris et al., 2016). Pharyngitis can be viral or bacterial in nature, but is predominately viral in adults (Kalra et al., 2016). An estimated 60% of adults receive an antibiotic when they seek care for pharyngitis, despite the current recommendation to treat with antibiotics only in conjunction with a positive group A streptococcus (GAS) test result (Harris et al., 2016; Short et al., 2017).

Review of Literature and Background

There is no single sign nor symptom that determines the etiology of a sore throat; therefore, the diagnosis of GAS should be based on lab confirmation. There are scoring systems that can be beneficial in predicting a patient's risk of GAS based on clinical presentation. The Centor Score, the McIsaac system, and the FeverPAIN tool can help the healthcare staff to determine the need for obtaining a throat swab to assess for GAS (Mustafa & Ghaffari, 2020).

The Centor Score takes into consideration four exam findings: absence of a cough, history of fever, tenderness of anterior cervical lymph nodes and tonsillar exudates (Mustafa & Ghaffari, 2020) and assigns a point value of 0 or +1 for each exam finding. The modified version of the Centor Score also assigns a point value for the age of the patient seeking care of -1 to +1. The Centor Score has been validated (Aalbers et al., 2011) and can be used as an adjunct to the physical exam to determine next steps. A score of 3 or greater raises the probability of GAS by 17%, (Aalbers et al., 2011) necessitating the need for a rapid streptococcus test (RST; Mustafa & Ghaffari, 2020). The current treatment recommendation for a positive GAS is selection of an appropriate antibiotic (Short et al., 2017).

Theoretical Framework

Iowa Model of Evidence-Based Practice Change provided the framework for the project. The model fits well as it anticipates changes in the planning and implementation phases (Cullen et al., 2018). There were multiple delays and changes due to the COVID-19 pandemic. One of the steps within the Iowa Model is “Redesign” which helped guide the project manager to make necessary adjustments.

Purpose

The purpose of the project was to determine if implementation of the Centor Score by nursing staff during triage of adult patients who present to a drive up COVID-19 and GAS testing site leads to evidence-based treatment for GAS.

Methods and Design

The initial study design was anticipated to be the emergency department (ED) in a rural northern Minnesota Indian reservation. However, the COVID-19 pandemic affected the ability of the healthcare organizations to support new projects. The data collection site was moved to the outpatient nursing department, in a drive-up testing site located in the ED parking lot. All adult patients residing on the Indian reservation between the age of 18-64 who, had a clinic order for an RST, presented to the drive-up testing site.

Human Subject’s Protection

The project manager sought and obtained approval from the university internal review board (IRB) where the project manager was enrolled and the Indian Health Service IRB prior to implementation. During data collection, nursing staff completed a Centor Score and recorded the data collection on a sheet using only a medical record number. There was no other identifying information included on the data sheet. The data sheets were placed in a locked, metal box. The

sheets then were retrieved by the on-site co-investigator and de-identified. The Centor Score and age were provided to the project manager with no identifying information included.

Sample and Setting

The patient sample included adults who lived on the Indian reservation who called the local clinic and spoke with a registered nurse (RN) regarding a sore throat. The RN sent a note to the physician on call, who entered an order for a GAS and/or a COVID-19 test to be collected at the drive-up testing trailer.

Due to limitations of the COVID-19 pandemic, and a change of setting for data collection, the sample was limited. The samples were collected over a two-week period (ten weekdays) based on the clinic hours of the drive-up location.

Instruments and Measures

Description and Procedure

Patients who presented to the drive-up testing location had a Centor Score calculated by a RN. A point value of 0 or +1 for each exam finding was assigned based on the Centor Score tool values. The age of the patient seeking care was noted and a value of -1 to +1 was assigned (Mustafa & Ghaffari, 2020). The RN documented the patient Centor Score on the Centor Score data collection tool. The RN obtained the RST as ordered and regardless of the Centor Score. The result of the RST was resulted from the lab and the RN completed data sheet was placed in the designated locked box.

Identifying Steps for Data Collection

A triage sheet and assessment sheet for the nursing staff to use was created, and a data collection tool was used by the RN to collect RST testing information. The education was provided to the nursing staff in print, power point via email, face-to-face education and follow-

up monitoring. The data collected included the medical chart number, the calculated Centor Score assigned by the RN, the result of the RST (if the test was positive or negative), if the patient received an antibiotic or not, and if there was any other bacterial disease process being treated).

Data Analysis Methods

Due to the pandemic, and the change in data collection location, the planned statistical comparison was not completed.

Results

Seven persons were screened utilizing the Centor Score criteria in the timeframe designated in the study design. Two of the seven subjects were excluded as they were under age 18, leaving five eligible subjects (N=5). The patient with a Centor Score of 0 had a negative GAS test result. Two of the subjects had a Centor Score of 1 and both tested negative for GAS. Of the two persons who had a Centor Score of 2, both had negative GAS test results. One of the five patients who tested negative for GAS did receive an antibiotic but for a non-GAS related condition. The patient was treated with the antibiotic Augmentin for a scalp infection. In each of the five patient scenarios, an antibiotic was not prescribed when the patients had the negative strep test. There were no positive strep tests obtained.

One of the Centor Score criteria includes assessing if the patient has a temperature or reports a fever by history (Mustafa & Ghaffari, 2020). The collection of the RST and COVID-19 tests occurred in a portable trailer in an outdoor setting. The temperature of the inside of the portable trailer was a barrier to completing the Centor Score accurately; the trailer was typically 50-degrees. The thermometer used by nursing staff in the screening trailer was an Exergen TAT-5000 TemporalScanner Thermometer. The required operating temperature for this thermometer

is 60 degrees to 104 degrees Fahrenheit. The nursing staff would take the thermometer to the patient's vehicle, complete the screening while standing outside of the patient's car and then collect the strep test. The temperature of the patient's skin, the outdoors and the temperature of the vehicle could also have affected the operation of the thermometer.

Discussion

Use of the Centor Score at the time of RN triage correlated with the findings in the literature. Mustafa and Ghaffari (2020) reported individuals with a Centor Score of 4 or greater had a 56% greater probability of testing positive for GAS compared to those with a score of 0 who had just a 2.5% probability of testing positive. All five patients in the study population had a score of 3 or less and a negative GAS; this would be consistent with the finding reported by Mustafa and Ghaffari (2020). When used appropriately, the Centor Score tool may help decrease the number of RSTs obtained and possibly the number of antibiotics prescribed for patients with viral pharyngitis. Following the Centor Scoring instructions, patients with Centor Score of less than 2 should not typically have a strep test collected (Mustafa & Ghaffari, 2020).

Implications for Nursing

The education component of the project had to be adapted due to the COVID-19 pandemic. The outpatient nurse manager presented a basic project overview and a binder with Centor Score education to the nursing staff. The planned pretest and posttest to determine RNs' knowledge of the Centor Score were not completed as planned based on perceived RN staff workload during the pandemic. The RN noted the thermometer was not working to complete the exact temperature and this was noted on the Centor Score collection tool but not discovered until review of data was completed.

Limitations

The study's sample size was small (N=5). The COVID-19 pandemic resulted in a delay in the project start date, delay in anticipated data collection, a shorter data collection timeframe, and a change in the location of the RST collection. This project would likely yield a greater sample size if it were to be reproduced outside of the pandemic timeframe. The ED would be a better setting due to the volume of strep tests generally performed, the number of patient visits on a daily basis, and the 24-hour setting.

Conclusions and Future Research

The Centor Score can be helpful to determine the likelihood of GAS based on patients' symptoms. Even with a very small sample, appropriate treatment was provided to patients with a Centor Score of 2 or less.

This project could be used as impetus for further education and process improvement at the facility. The results can demonstrate to staff that using evidenced- based tools and following recommended GAS treatment guidelines leads to better patient outcomes. Additionally, nursing staff should be educated on the importance of following organizational policies for non-working equipment, to prevent any unintended consequences in patient care. Outdoor screenings and collection sites are popular in the current COVID-19 pandemic era and it is vital that staff ensure the equipment used is suitable for the climate so results can be considered reliable.

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