VOLUME - 10, ISSUE - 12, DECEMBER - 2021 • PRINT ISSN No. 2277 - 8160 • DOI : 10.36106/gjra

Original Research Paper

Paediatrics

CORRELATION BETWEEN MCISSAC MODIFICATION OF CENTOR SCORE ≥ 3 & THROAT SWAB CULTURE IN PREDICTING STREPTOCOCCAL PHARYNGITIS IN PATIENTS PRESENTING WITH SORE THROAT- CROSS SECTIONAL STUDY

M. Nachu Kannan* Post Graduate, Department of Pediatrics, RMMCH, Chidambaram-608002, Tamilnadu. *Corresponding Author

Prof Dr. C. S. Balachandran Professor, Department of Pediatrics,RMMCH,Chidambaram-608002, Tamilnadu

Dr L. Ilangumaran Assistant Professor, Department of Pediatrics, RMMCH, Chidambaram-608002, Tamilnadu

ABSTRACT

BACKGROUND: GABHS pharyngitis is antecedent for post infectious immunologic complication of Rheumatic fever/Rheumatic Heart Disease, a leading cause of cardiovascular morbidity and mortality among many developing parts of the world. It is difficult to diagnose group A beta-haemolytic streptococci (GABHS) pharyngitis based only on clinical findings. The McIsaac modification of Centor scoring system has been used as a reliable clinical tool for diagnosis.

AIMS AND OBJECTIVE: To analyze the importance of symptoms and signs in assessing the risk of streptococal pharygitis and to correlate McISSAC score ≥ 3 with gold standard throat swab culture.

METHODS: Using the McIsaac modification of Centor scoring system, throat swab cultures in those with a McIsaac modification of Centor score of 3 or more, we evaluated 80 children (aged 3–14 years) with sore throat as clinical diagnosis of pharyngitis.

RESULTS: About 77.8% of patient tested positive for GABHS have Mc-Issac score of 5, whereas 22.2% of positive tested patient have score of 4 and again 0% of positive patient have score of 3. The Pearson's Chi-square test of association is highly statistical significant. Therefore, 100% of positive GABHS findings have Mc-Issac score of 4 and 5.

CONCLUSION: Individual signs and symptoms are not very powerful enough to discriminate GABHS pharyngitis from other types of sore throat. The McIsaac score is well calibrated clinical prediction rule for estimating the probability of GABHS pharyngitis. The result of McIsaac score ≥ 3 and culture finding of GABHS have very close association with each other.

KEYWORDS : McIsaac modification of centor score, GABHS, Throat swab culture and sensitivity.

INTRODUCTION

Sore throat is a most common complaint in upper respiratory tract infection and it may indicate infection with Group A streptococci.[1] Eventhough viruses cause most acute pharygitis episodes, Group A streptococci causes 10-30% of cases of acute pharyngitis in children 5 to 15 years.[9] GAS pharyngitis is antecedent for invasive streptococcal infection and post non suppurative sequelae like Glomerulonephritis and Rheumatic fever/RHD, a leading cause of cardiovascular morbidity and mortality among many developing parts of the world.[10]

McIssac modification of centor score has five criteria to predict the probability of the presence of streptococcus pyogenes (GABHS) in a throat swab culture and thereby appropriately prescribe antibiotics to alleviate symptoms earlier and decrease the rates of incidence for acute Rheumatic fever, suppurative complications, missed school and work days.[1]

Throat swab culture and sensitivity is considered as the reference gold standard test for the diagnosis of streptococcal pharyngitis. Clinical prediction rules have been developed over the last 40yrs to differentiate streptococcal pharyngitis from other causes. The most widely recognized Clinical prediction tool for GABHS pharygitis is the McISSAC modification of centor score.

AIMS AND OBJECTIVE

To analyze the importance of symptoms and signs in assessing the risk of streptococal pharygitis and to correlate McISSAC modification of centor score ≥3 with gold standard throat swab culture.

MATERIAL AND METHODS

Study was conducted on a total of 80 patients who presented to Pediatric Department at Rajah Muthiah Medical College Hospital, Chidambaram during OCTOBER 2019 TO SEPTEMBER 2021.Patients aged between 3 years to 14 yrs who presented with sore throat with McISSAC modification of centor score ≥ 3 were included in the study. Children below 3years, above 14yrs, presented with sore throat with McISSAC modification of centor score less than 3 and those on antibiotic therapy in the previous week and Immunocompromised patients were excluded from the study. Patients included in the study were scored as per McISSAC modification of Centor score.

Table-1: McISSAC modification of Centor score

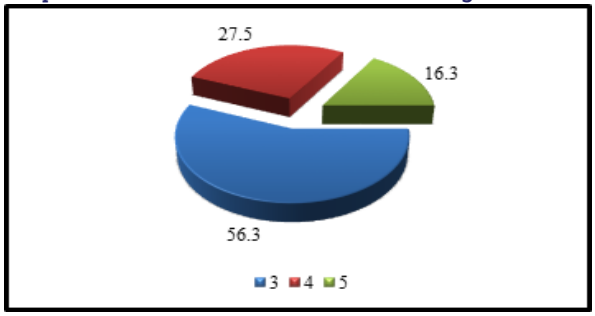
Clinical criteria	Points
Absence of cough	1
Swollen and tender nodes	1
Temperature >38c	1
Tonsillar exudates or swelling	1
Age 3 to 14 years	1

Throat swab was taken for all the patients in study group. McIsaac score and Throat swab culture and sensitivity results were compared and analyzed statistically.

RESULTS

The mean age of our patients was 8 ± 3 years. The majority of patients were male (56.3%). Distribution of socio economic class among study group showed higher distribution for socioeconomic class 4 (41.3%) and 5(30.0%)

Graph-1: McIsaac modification of Centor Scoring distribution



McIsaac modification of Centor Scoring distribution were 3 is 56.3%, 4 is 27.5%, 5 is 16.3%.

Out of 80 patients, McIsaac modification of Centor score of 4 (22.2%) and 5 (77.8%) GABHS was cultured on throat swab in 9 patients. However, in patients with McIsaac modification of Centor sore of 3, GABHS was not found on throat swab culture.

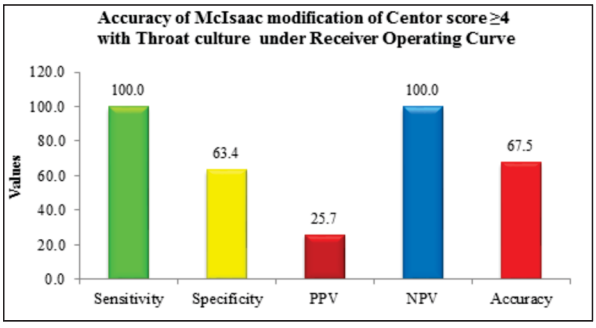
Table-2: Comparison between Centor Scoring with throat culture

			Throat culture		Total	X^2 - value	p-value
			Positive	Negative			
Mc-Issac Modification of Centor Scoring	3	Count	0	45	45	29.431	0.0005 **
		%	0.0%	63.4%	56.3%		
	4	Count	2	20	22		
		%	22.2%	28.2%	27.5%		
	5	Count	7	6	13		
		%	77.8%	8.5%	16.3%		
Total		Count	9	71	80		
		%	100.0%	100.0%	100.0%		
** Highly Statistical Significance at p < 0.01 level							

The above table shows comparison between Centor Scoring with Throat culture by Pearson's Chi-square test were $X^2=29.431$, $p=0.0005<0.01$ which shows highly statistical significant association between Mc-Issac modification of Centor Scoring and Throat culture.

Table - 3: Comparison of GABHS VS MC-Issac modification of centor Score by sensitivity and specificity analysis

Mc Issac modification of centor Score with Throat culture				
		Throat culture		Total
		Positive	Negative	
McIsacc score ≥4	Positive	9	26	35
	Negative	0	45	45
Total		9	71	80



The sensitivity is 100%, which means that Mc-Issac score is rightly identifying the disease of the patients. The specificity is 63.4%, which means that Mc-Issac modification of Centor Scoring ≥4 is rightly identifying no disease in 63.4% of the patients. The positive predicted value is only 25.7%, that is if the test result is positive, the probability of having disease is only 25.7%. The negative predicted value is high ie 100%. If the test result is negative, the probability of not getting the disease is high. Accuracy is around 67.5%

DISCUSSION

GABHS is recognized to be the most important pathogenic bacterium that causes sore throat because of its sequelae and complications. Tonsillo pharytngitis due to streptococci is a potentially serious disease as it can cause invasive streptococcal infection and post non suppurative sequelae like Glomerulonephritis and Rheumatic fever/Rheumatic Heart Disease. As a result, rapid diagnosis and adequate treatment are utmost necessary. For last 50 years, the fundamental test has been throat swab culture. It detects around 90%-99% of positive cases so it is accepted as the gold standard test in GABHS diagnosis.[2]

Studies comparing clinical diagnosis with throat culture have shown around sensitivity of 50% to 70% and with specificity of 60% to 80%.Thus clinical judgement may miss up to 50% of GABHS infections while identifying large number 20% to 40% of non-GAS sore throat presentations. Clinical prediction tools have been proposed as a way to increase in accuracy of clinical diagnosis of GABHS. Even though several scores have been proposed for assessing the patients with sore throat, Centor and McIsaac scoring system are most widely used clinical prediction rules for management of Acute Pharyngitis in children.[5,6,7,8]

In our study McIsaac modification of Centor scoring system had sensitivity 100%. Specificity 63.4%, positive predictive value 25.7%, negative predictive value 100% Accuracy of 67.5%. The high yield observed in our series might be due to the clinical assessment and throat swabculture testing being performed by trained medical personnelalone, which followed a specific protocol after in-house training.

Amber Hanif Palla studied with 137 patients using McIsaac scoring system. McIsaac scores were found to be around 100% sensitive and 68.7% specific and giving a positive predictive value (PPV) of 12.7%, a negative predictive value (NPV) of 100%.[3]

Ching-Tang Shih et al studied with 342 patients using McIsaac scoring system & throat swab cultures. A McIsaac score of 5 had a sensitivity of 71%, specificity of 70%, positive predictive (PPV) value of only 9.3%.[4]

The limitations of our study includes non-performance of follow-up cultures to exclude carrier states and a tertiary care hospital- based setting. A similar high sensitivity might be difficult to achieve in primary care settings.

The McIsaac modification of Centor scoring system is a simple primary care management approach which will improves identification of GAS infection, earlier intiation of antibiotic therapy and limits the need for throat swabs in all patients with sore throat.[1]

Conflicts of interest: None
Funding: None

CONCLUSION

Individual signs and symptoms are not very powerful enough to discriminate GABHS pharyngitis from other types of sore throat. The McIsaac score is well calibrated clinical prediction tool for estimating the probability of GABHS pharyngitis. The result of McIsaac score ≥ 3 and culture finding of GABHS have very close association with each other.

REFERENCES

1. W J McIsaac,D White, D Tannenbaum, and D E LowA clinical score to reduce unnecessary antibiotic use in patients with sore throat CMAJ. 1998 Jan 13; 158(1): 75–83.
2. Ana Gabriela P dos Santos; Eitan N. Berezin Comparative analysis of clinical and laboratory methods for diagnosing streptococcal sore throat J. Pediatr. (Rio J.) vol.81 no.1 Porto Alegre Jan./Feb. 2005
3. Amber Hanif Palla, Rafeeq Alam Khan, Anwar H. Gilani Over prescription of antibiotics for adult pharyngitisis prevalentin developing countries but can be reduced using McIsaac modification of Centor scores: a cross-sectional study
4. Ching-Tang Shih Ching-Chiang Lin Chung Ching Lu Evaluation of a Streptococcal Pharyngitis Score in Southern Taiwan Volume 53, Issue 1, February 2012, Pages 49-54.
5. Yavuz FURUNCUOĞLU1, Filiz SAĞLAM, Ahmet KUTLUHAN3 Acute exudative tonsillitis in adults: the use of the Centor score and some laboratory tests Turk J Med Sci (2016) 46: 1755-1759 © TÜBİTAK doi: 10.3906/sag-1510-93.
6. Imanuel Y. Malino, Dwi Lingga Utama, Yati Soenarto McIsaac criteria for diagnosis of acute group-A -hemolytic streptococcal pharyngitis VOLUME53 September 2013 Number 5
7. Elena Chiappini MD, PhD Nicola Principi MD, Italian panel on the Management of pharyngitis in children. Management of Acute Pharyngitis in Children: Summary of the Italian National Institute of Health Guidelines, Volume 34, Issue 6, June 2012, Pages 1442-1458.e2.
8. Tony MO Bakare and Peter Schattner. The usefulness of a clinical 'scorecard' in managing patients with sore throat in general practice Asia Pac Fam Med.

2010; 9(1): 9. Published online 2010 Jul 29. doi: 10.1186/1447-056X-9-9.
9. Leung AK, Kellner JD. Group A -hemolytic streptococcal pharyngitis in children. Adv Ther 2004;21:277-87.
10. Cunningham MW. Pathogenesis of group A streptococcal infections. Clin Microbiol Rev 2000;13:470-511.