Section: General Surgery

Original Research Article

A CLINICAL STUDY ON MANTRELS SCORING SYSTEM OF ACUTE APPENDICITIS

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Abstract

Background: Appendicitis today is most common reason for emergency abdominal surgery and - has a lifetime risk of 7-8%n. Simple appendicitis can progress to perforation, which is associated with a much higher morbidity and mortality, and surgeons have therefore been inclined to operate when diagnosis is probable rather than wait until it is certain. Negative appendicectomy have been considered acceptable because the morbidity associated with complicated appendicitis is significantly higher. At present many scoring systems for diagnosis of acute appendicitis are available. MANTRELS scoring system is one of them and is purely based on history, clinical examination and few laboratory tests and is very easy to apply. **Materials and Methods:** The study is conducted in 100 patients at S.V.R.R.G.G.H hospital, Tirupati in department of general surgery who presented to outpatient and emergency department with acute abdomen suspicious of appendicitis and are willing for surgery are included in the study. After surgery appendicectomy specimen was sent to pathology department for histopathological examination. **Result:** In this study out of 100 cases 94 cases were operated and among them patients with MANTRELS score 7 to 10 had inflamed appendix. **Conclusion:** The MANTRELS scoring system is a fast, simple, non-invasive, repeatable and safe in females.

INTRODUCTION

The appendix was first described in 1521 and inflammation of the appendix has been known to be a clinical problem since 1759.[1,2] Appendicitis today is the most common reason for emergency abdominal surgery and has a lifetime risk of 7-8%.[3,4] It is a disease more commonly seen in younger population with a slight male preponderance. Its incidence rises slowly from birth and peaks in the late teen years, while gradually declining in the elderly age group.[5] Simple appendicitis can progress to perforation, which is associated with a much higher morbidity and mortality, and surgeons have therefore been inclined to operate when the diagnosis is probable rather than wait until it is certain.[6] As a result of their concern about this, surgeons create for themselves a surgical security zone which allows them to accept a 15-30% negative laparotomy rate with impunity.[7] Removal of normal appendix is an economic burden both on the patients and health resources. Misdiagnosis and delay in surgery can lead to complications like perforation and finally peritonitis.[8] At present many scoring systems for the diagnosis of acute appendicitis are available. MANTRELS scoring system is one of them and is purely based on history, clinical examination and few laboratory tests and is easy to apply.[9,10] The MANTRELS score was described in 1986,[11] and has been validated in adult surgical practice. The use of an objective scoring system such as MANTRELS system can reduce the negative appendicectomy rate to 0- 5%.[11-13] My study is to evaluate the role of MANTRELS scoring system in diagnosis of acute appendicitis.

Aim and Objectives

To evaluate the efficacy of MANTRELS scoring system in diagnosis of acute appendicitis and correlation with operative and histopathological findings.

To review its usefulness in cutting down the rate of negative appendicectomy without increasing morbidity and mortality.

MATERIALS AND METHODS

Type of Study: It is institution based Prospective Study

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Study duration: One year from the Scientific and Ethical committee approval.
Source of Data: The patients admitted in Department of General Surgery, S.V.R.RG.G. Hospital.
Sample size:100
Inclusion Criteria
Patient coming to hospital with pain abdomen and diagnosed provisionally as acute appendicitis and are willing for surgery are included in the study.
Exclusion Criteria

- Pregnant females.
- Any mass per abdomen.
- Patients with recent history of any abdominal surgeries. 4.Patient not willing for surgery.

Sample method

- Data will be collected in standardized proforma from all the patients presenting to the Department of General surgery, S.V.R.R.G.G.H Tirupati.
- Patients fulfilling the inclusion and exclusion criteria are selected.
- Informed and written consent is taken from the patient and included in study.

RESULTS

Table 1: Total cases studied.

Total no of cases suspected as appendicitis	No of cases operated	No of operated cases found to have inflamed appendix	Percentage
100	94	78	82.9

Table2: Age and sex distribution

Age in years	Male	%	Female	%	Total	%
<20	18	37.5	17	32.7	35	35
21-30	22	45.8	27	51.9	49	49
31-40	6	12.5	7	13.5	13	13
41-50	2	4.2	1	1.9	3	3
Total	48	100	52	100	100	100A

Table 3: Clinical Symptoms

Clinical symptoms	Number	Percentage
Abdomen pain	100	100
Anorexia	79	79
Nausea\vomiting	80	80

Table 4: Clinical signs

Clinical signs	Number	Percentage
RIF tenderness	96	96
Rebound tenderness	71	71
Fever	71	71

Table 5: Investigations results

Laboratory reports	Number	Percentage
Leucocytosis	74	74
Shift to left	24	24

Table 6: results of mantrels score

	No of patients	Score 7 to 10	Score 5 to 6	Score <5
Male	48	33	11	4
Female	52	36	14	2
Total	100	69	25	6

Table 7: Pathological diagnosis as per histopathological report

Histopathological report	Number	Percentage
Normal	16	17
Acute catarrhal appendicitis	31	32.9
Acute suppurative appendicitis	37	39.4
Acute gangrenous appendicitis	6	6.4
Acute perforative appendicitis	4	4.3

Table 8: Results on operated patients with mantrels score 7-10

	No of patients operated	Score 7-10	Appendicitis	Normal appendix
Male	44	33	31	2
Female	50	36	31	5
Total	94	69	62	7

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Table 9: Results on operated patients with mantrels score 5-6

	No of patients operated	Score 5-6	Appendicitis	Normal appendix
Male	44	11	7	4
Female	50	14	9	5
Total	94	25	16	9

Table 10: Diagnostic value of mantrels scoring system (GENDER).

	Males with score 7 -10	Females with score 7-10
Sensitivity	81.57%	75.67%
Specificity	66.66%	50.00%
Positive predictive value	93.93%	86.11%

Table 11: Diagnostic value of mantrels scoring system (PPV)

	No of patients operated	Score 7-10	Appendicitis	Positive predictive value
Male	48	33	31	93.93
Female	52	36	31	86.11
		Score 5-6		
Male	48	11	7	63.63
Female	52	14	9	64.28

Table 12: Diagnostic value of mantrels scoring system (HPE)

Mantrels Score	Histopathology	
	Appendicitis	Normal appendix
7-10 score	62	7
5-6 score	16	9

Table 13: Negative Appendicectomy

	No of negative appendicectomy	%
Male	6	12.5
Female	10	19.23

DISCUSSION

Acute appendicitis remains a common abdominal surgery throughout the world. Early and accurate diagnosis of acute appendicitis is required to reduce the morbidity and mortality associated with delayed diagnosis and complications. In addition to significant morbidity and mortality, negative appendicectomy is also responsible for loss of precious staff hours and financial resources.

Though there are lots of advances in the diagnostic field with the invention of sophisticated investigations, diagnosis of acute appendicitis remains an enigma for the attendant surgeon. The diagnosis of acute appendicitis continues to be difficult due to the variable presentation of the disease and the lack of reliable diagnostic test. Time and again, it has proved that some of the investigations already discussed are costly, time consuming; require more sophisticated equipment and expertise, while some are not feasible and not readily available.

So, even today, a thorough clinical examination with basic investigations like WBC count remains the cornerstone in the diagnosis of acute appendicitis. With this background many eminent surgeons and physicians have been adopting different scoring systems in order to decrease negative appendicectomy.

A number of clinical scoring systems has been used as complimentary aid in diagnosis of acute appendicitis. Initial assessment can be improved by use of a clinical scoring system.

MANTRELS Scoring System is one of the many scoring systems available today. It is bases on history, physical examination and few laboratory tests. It is simple, easy to apply and cheap complimentary aid for supporting the diagnosis of acute appendicitis.

The present study was undertaken to evaluate the usefulness of MANTRELS scoring system in reducing the number of negative appendicectomy and to evaluate its sensitivity & positive predictive values in the diagnosis of acute appendicitis. Our results and observations were discussed and compared with various other studies.

In the present series the males and females ratio was almost equal. The age group in which acute appendicitis occurred commonly was between 14 and 30 years. It is clear that incidence is less in younger and older age groups with peak incidence in 2nd and 3rd decade.

Pain was the commonest presenting symptom and has been observed in all the cases (100%) in the present series. The classical shifting of pain from umbilical region to RIF was seen only 36% of the cases. In 52% of the cases pain was localized to RIF, and 12% of the cases had diffuse abdominal pain.

Next common symptoms observed were nausea/vomiting in 80% of cases and anorexia in 79% of cases. Majority of the patients presented within 48 hrs after the onset of pain, with most of them presenting between 12-24 hrs of onset of pain.

On clinical examination, tenderness at Mc Burney's point was the commonest sign (96%). Guarding was present in 8% of patients. It was present when the

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inflammation was severe. Rebound tenderness was present in 71%. In the present study the TLC was increased in 74%, and Shift to left was noted in 24% of the cases.

Plain X-ray abdomen taken in erect posture showed ground glass appearance in 3 patients, suggestive of diffuse peritonitis. Free gas under the diaphragm was not present in the cases with perforated acute appendicitis.

For assessment, the patients were categorized into male and female. Out of 100 cases studied, 48 were and 52 were female.

Out of 48 males, score of 7-10 were 33, score of 5-6 were 11 and 4 had score < 5. These 4 patients did not undergo surgery. Out of 52 female patients, 36 had score of 7-10, 14 had score of 5-6 and 2 had score < 5. Management was on the same lines as for males.

Total of 94 patients were operated, out of which 44 were males, 50 females. 30 males having score 0f 7-10 had acute appendicitis, 2 patients had normal appendix (1 with Meckel's diverticulitis and 1 with mesenteric lymphadenitis).

Male patients having score of 5-6 were11, out of which 7 patients had acute appendicitis, 4 patients had normal appendix and with all the 4 having mesenteric lymphadenitis.

In 36 female patients having a score 7-10, 31 had acute appendicitis, 5 patients had normal appendix with other diseases, out of which 3 patients had PID and 2 patients had mesenteric lymphadenitis. In 14 females with score 5-6, had acute appendicitis, 5 had normal appendix with other diseases (4 PID and 1 mesenteric lymphadenitis).

In our series a score of 7-10 using MANTRELS scoring system had a total sensitivity of 79.48%.

CONCLUSION

The sensitivity of the MANTRELS score system in males with score ≥7 to 10 was 81.57% with specificity of 66.66%. The positive predictive value in males was 93.93%.

The sensitivity of the scoring system in females with score ≥7 to 10 was 75.67% with specificity of 50%. The positive predictive value in females was 86.11%. Thus MANTRELS score is very effective in the diagnosis of acute appendicitis in men but some other diagnostic modality is necessary to ascertain the diagnosis in females along with the clinical scoring system to rule out other pelvic pathology.

In the diagnosis of acute appendicitis, the MANTRELS score is a fast, simple, reliable, non-invasive, repeatable and safe diagnostic modality without extra expense and complications.

In is very handy in peripheral hospitals where back up facilities like USG scan or CT scan is not available.

It can be very helpful for junior doctors provided it is applied purposefully and objectively in patients of abdominal emergencies.

The application of this scoring system improves diagnostic accuracy and consequently reduces negative appendicectomy and thus reduces complication rates.

REFERENCES

1. Williams GR. Presidential address: a history of appendicitis. With anecdotes illustrating its importance. Ann surg 1983:197:495-506.
2. Scott GB. The primate caecum and appendix vermiformis: a comparative study. J Anat 1980:131: 549- 63.
3. Langman J, Sadler TW. Langman's Medical Embryology 9th revised ed. UK: Lippincott Williams and wilkins, 2003.
4. Wakeley CP. The position of the vermiform appendix as ascertained by an analysis of 10,000 cases. J Anat 1933:67:277-83.
5. Collins DC. 71,000 human appendix specimens. a final report, summarizing forty years' study. Study . Am i Proctol 1963: 14: 265-81.
6. Hoffmann J, Rasmussen O. Aids in the diagnosis of acute appendicitis. Br J Surg 1989;76: 774-90.
7. Hoffmann J, Rasmussen O. Aids in the diagnosis of acute appendicitis. Br J Surg 1989;76:774-90.
8. Ohmann C, Yang Q, Franke C: the ;abdominal pain study group. Diagnostic scores for acute appendicitis. Eur J Surg 1995;161; 273-81.
9. Fenyo G, Lindberg G, Blind P, Enochsson L, Oberg A. Diagnostic decision support in suspected acute appendicitis: Validation of a simplified scoring system. Eur J Surg 1997; 163; 831-8.
10. MANTRELS A.: A Practical score for the early diagnosis of acute appendicitis. Ann Emerg Med 1986;15: 557-564.
11. Teicher I Scoring System to aid in diagnoses of appendicitis. Ann Surg 1983;198:753.
12. Lamparelli M. A prospective evaluation of the combined use of the modified MANTRELS score with selective laparoscopy in adult females in the management of suspected appendicitis. AnnR Coll Surg Engl 2000;82:192.

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