Diagnosing Intestinal Tuberculosis Using a Predictive Model Based on Endoscopic Features

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Abstract

Background: Intestinal tuberculosis is common in many parts of the world. Diagnosis of intestinal tuberculosis can be difficult in many cases. Gastroenterologists often find lesions in the terminal ileum during colonoscopy which can help diagnosing intestinal tuberculosis and differentiating it from Crohn's disease. If both symptoms and commonly available investigations are suggestive of intestinal tuberculosis this may obviate the need for further expensive investigations especially in resource constrained settings.

Methods: Eight symptomatic subjects with terminal ileal lesions found during colonoscopy were analyzed using a predictive model.

Results: Among eight subjects included in the study seven had features suggestive of intestinal tuberculosis. One had features which were inconclusive.

Conclusion: A predictive model based on endoscopic features can help in the diagnosis and management of intestinal tuberculosis.

Keywords: Intestinal Tuberculosis; Gastroenterologists; Colonoscopy; Crohn's Disease

Introduction

Intestinal tuberculosis, once considered as a disease prevalent only in economically deprived populations, has re-emerged in many places due to HIV infection and use of immunosuppressant medications [1,2]. Tuberculosis involves ileocaecal region and ascending colon in the majority of patients [3,4]. Intestinal tuberculosis can occur after taking food contaminated with tuberculous bacilli. Haematogenous spread of tuberculous bacilli to submucosal lymphatic structures from a distant pulmonary infection is also possible. Human mycobacterium is found in most of these patients [5]. Less than half of these patients have radiological features suggestive of pulmonary infections [6]. It is believed that the availability of anti-tuberculosis chemotherapy to vulnerable populations in South Asian countries has significantly reduced the incidence of gastrointestinal tuberculosis associated with primary pulmonary disease [7]. Now the most common variety is primary tuberculosis of the intestinal tract [8].

Diagnosis of intestinal tuberculosis and differentiating it from Crohn's disease often requires colonoscopy with ileal intubation, radiology, serology, and PCR [9,10]. So, diagnosing intestinal tuberculosis may be difficult in many populations due to scarcity of resources. Diagnosis of intestinal tuberculosis in these circumstances is done with suggestive clinical features, common investigations (CBC, Hb%,...
ESR, CXR and Tuberculin test) along with colonoscopy and biopsy. After diagnosis is made gastroenterologists and physicians prescribe anti-tubercular chemotherapy and then monitor patients for clinical and laboratory features which suggest improvement [11].

A predictive model based on endoscopic features [12] was found to make a correct diagnosis in 87.5% patients with a positive predictive value of 95% for Crohn’s disease and 89% for intestinal tuberculosis.

This study was done to find out how this predictive model would work in subjects which were diagnosed as intestinal tuberculosis based on clinical, laboratory and colonoscopy findings.

**Methods**

Eight symptomatic patients with colonoscopic findings of terminal ileal ulcers were included in this study. A retrospective analysis of clinical, laboratory and colonoscopy findings was done. Diagnosis of intestinal tuberculosis or Crohn’s disease was made based on a predictive model [12]. Eight features were included: transverse ulcers, fewer than 4 segment involvement, patulous IC valve, and pseudopolyps (common in ITB), and longitudinal ulcers, aphthous ulcers, cobblestoning and anorectal lesions (common in CD). A score of +1 and -1 was assigned for the presence of each feature common to CD and ITB respectively, and composite score > 0 was suggestive of CD, < 0 was suggestive of ITB.

**Results**

Total eight subjects were included in the study. All subjects were male. Mean age was 42.38 years (18 to 72).

Diagnosis in seven subjects was intestinal tuberculosis. In one subject diagnosis could not be made.

Following are the features and diagnosis of these patients based on the predictive model:

<table>
<thead>
<tr>
<th>Patient</th>
<th>Clinical Features (C/F)</th>
<th>Features of ITB</th>
<th>Features of Crohn’s disease</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient 1: M 72</td>
<td>Anaemia, weight loss, night fever and weakness.</td>
<td>Transverse ulcer (-1), only one segment involvement (terminal ileum) (-1), patulous IC valve absent (0), pseudopolyps absent (0).</td>
<td>No anorectal lesion (0), no cobble stoning (0), no longitudinal ulcer (0), no aphthous ulcers (0).</td>
<td>Total points -1 + -1 = -2</td>
</tr>
</tbody>
</table>
Diagnosing Intestinal Tuberculosis Using a Predictive Model Based on Endoscopic Features


Features of intestinal tuberculosis: Transverse ulcers (-1), fewer than 4 segments involved (-1), patulous IC valve absent (0) and no pseudo polyps absent (0).

Features of Crohn’s disease: No aphthous ulcers (0), no anorectal lesions (0), no longitudinal ulcers (0), no cobble stoning (0).

Total: -2 Diagnosis: Intestinal Tuberculosis.

Citation: Debashis Chowdhury. "Diagnosing Intestinal Tuberculosis Using a Predictive Model Based on Endoscopic Features". EC Gastroenterology and Digestive System 7.9 (2020): 122-132.
Patient: 3 M 54, C/F: Pain lower abdomen, fever, anorexia, weight loss, DM, Hypertension.
Features of Intestinal TB: Transverse ulcers (-1), less than 4 segment involvement (-1), patulous IC valve-absent (0), pseudo polyps- absent (0).
Crohn’s disease: no longitudinal ulcers (0), no aphthous ulcers (0), no cobblestoning (0) and o anorectal lesions (0).
Total: -2 Diagnosis: Intestinal Tuberculosis.
Patient: 4. M 47, C/F: Pain abdomen, altered bowel habit

Features of intestinal tuberculosis: transverse ulcers absent (0), fewer than 4 segment involvement (-1), patulous IC valve absent (0), and pseudopolyps absent (0).

Features of Crohn’s disease: no longitudinal ulcers (0), aphthous ulcers present (+1), no cobblestoning (0), and no anorectal lesions (0). Total: -1+1=0 Diagnosis:?
Patient: 5. M 42; C/F: Altered bowel habit, pain abdomen.

Features of intestinal tuberculosis: transverse ulcers absent (-1), fewer than 4 segment involvement (-1), patulous IC valve absent (-1), and pseudopolyps absent (0).

Features of Crohn’s disease: no longitudinal ulcers (0), no aphthous ulcers (0), no cobblestoning (0), and no anorectal lesions (0). Total: -3 Diagnosis: Intestinal Tuberculosis

Features of intestinal tuberculosis: transverse ulcers present (-1), fewer than 4 segment involvement (-1), patulous IC valve present (-1), and pseudopolyps present (-1).

Features of Crohn’s disease: longitudinal ulcers absent (0), aphthous ulcers absent (0), cobblestoning absent (0), and anorectal lesions absent (0). Total: -4 Diagnosis: Intestinal Tuberculosis.

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Patient: 7. Male 33; C/F: Frequent passage of loose stool, anaemia and weight loss.

Features of intestinal tuberculosis: transverse ulcers present (-1), fewer than 4 segment involvement (-1), patulous IC valve present (-1), and pseudopapillae absent (0).

Features of Crohn’s disease: longitudinal ulcers absent (0), aphthous ulcers absent (0), cobblestoning absent (0), and anorectal lesions absent (0). Total: -3 Diagnosis: Intestinal Tuberculosis.
Patient: 8. Male 45; C/F: Alteration of bowel habit, anaemia and general weakness.

Features of intestinal tuberculosis: transverse ulcers present (-1), fewer than 4 segment involvement (-1), patulous IC valve present (-1), and pseudopolyps absent (0).

Features of Crohn's disease: longitudinal ulcers absent (0), aphthous ulcers absent (0), cobblestoning absent (0), and anorectal lesions absent (0). Total: -3 Diagnosis: Intestinal Tuberculosis.
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Discussion

In this study, using the predictive model, diagnosis could be made in seven subjects. According to a recent meta-analysis [13], the presence of recto-sigmoid involvement, longitudinal ulcers, aphthous ulcers, cobblestone appearance, luminal stricture, mucosal bridge, and skip lesions were likely due to Crohn’s disease and the presence of ileocaecal involvement, transverse ulcers were associated with intestinal tuberculosis. The model was validated by gender, clinical manifestations, endoscopic, and pathological findings in 49 patients of whom 27 had Crohn’s disease and 22 had intestinal tuberculosis. The sensitivity, specificity, and accuracy for diagnosis of intestinal tuberculosis were 90.9%, 92.6%, and 91.8%, respectively [13]. Bae JH., et al. [14] in their study found that the accuracy of endoscopic scoring for was 81.2% (65/80), with 65.0% sensitivity for Crohn's disease and 97.5% for intestinal tuberculosis.

Limitations of the Study

Sample size was very small. Moreover, addition of imaging (Contrast CT or MR Enteroscopy), serology for IBD and PCR for mycobacterium tuberculosis could help further validating the results of this study which is based on the endoscopic prediction model [9,13].

Conclusion

Although intestinal tuberculosis is commonly found in developing countries, cases are now detected also in developed countries in subjects with altered immune function either due to HIV infection or medications. Endoscopic detection of lesions in the terminal ileum can help in the diagnosis of intestinal tuberculosis. Moreover, presence of characteristic lesions in ileum and caecum can help differentiating intestinal tuberculosis from Crohn's disease. When typical symptoms are present and routine investigations (CBC, ESR, CXR and Tuberculin Test) are also suggestive of intestinal tuberculosis colonoscopic detection of characteristic lesions may obviate the need for expensive investigations especially in resource constrained settings. Furthermore, studies have revealed that typical endoscopic features, when found in symptomatic patients, are both sensitive and specific for the diagnosis of intestinal tuberculosis. A predictive model based on endoscopic features can help gastroenterologists and physicians diagnose intestinal tuberculosis and differentiate it from Crohn's disease more effectively.

Bibliography

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