

The Etiology and Clinical Characteristics of Mesenteric Adenitis in Korean Adults

This study is aimed at investigating the etiology and clinical characteristics of mesenteric adenitis in Korean adults, prospectively. Clinical manifestations of fifteen patients who presented with the acute onset of right lower quadrant pain and sonographically enlarged mesenteric lymph nodes and normal appendix were evaluated. For etiologic diagnosis, stool culture, serologic test for Epstein-Barr virus, and Widal test were performed. Colonoscopy with mucosal biopsies and microbial tissue cultures were performed in 12 of 15 patients. Of fifteen patients 6 were male and the average age was 29.9 (17~41) years. Associated symptoms were diarrhea (80%), fever (73%), nausea and vomiting (27%). Right lower quadrant tenderness was observed in all cases but rebound tenderness was observed only in 26.7% of the cases. Etiology was identified in 7 cases (47%): 2 *Yersinia enterocolitica* infection, 2 non-typhoidal *Salmonella* infection, 2 tuberculosis, and 1 typhoid fever. In colonoscopic examination, signs of active inflammation were observed in 9 cases (75%) and inactive or normal findings in 3 cases (25%). All of our patients, except for the patients with tuberculosis and typhoid fever who needed specific antibiotic therapy, improved spontaneously without using antibiotics. In conclusion, the etiology of mesenteric adenitis in Korean adults seems to be different from that of western countries. Furthermore, mesenteric adenitis in Korean adults is a clinical syndrome, frequently found in a relatively young age group, which improves spontaneously unless specific anti-microbial agents are indicated by microbiological tests, such as tuberculosis or typhoid fever. (*JKMS 1997; 12: 105~10*)

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INTRODUCTION

Mesenteric adenitis, which usually presents with fever and right lower quadrant abdominal pain (1), is the most frequent clinical diagnosis in patients who are misdiagnosed as having acute appendicitis and undergo surgery (2). Although mesenteric adenitis can be associated with various medical and surgical conditions and may represent nonspecific findings in children (3), it is usually associated with infectious enterocolitis in adults (4). In western countries, the majority of cases of mesenteric adenitis are caused by *Yersinia enterocolitica* in the post-antibiotic era (1), but some rare cases of mesenteric adenitis caused by *Mycobacterium tuberculosis* (1), *Mycobacterium avium intracellulare* in patients with AIDS (5), Epstein-Barr virus (6), and Parvovirus B19 (7) have been reported. It is also known that geographical differences in the prevalence of *Y. enterocolitica* exist (8, 9), and only a few cases have been reported in the Korean adult population (10,11). Furthermore, the characteristics of

mesenteric adenitis in Korea have not yet been elucidated. Therefore, we evaluated the etiology and clinical characteristics of mesenteric adenitis prospectively in Korean patients who presented with right lower quadrant pain and ultrasonographically enlarged mesenteric lymph nodes.

MATERIALS AND METHODS

Patients who presented with the acute onset of right lower quadrant pain and visited the Samsung Medical Center from May 1995 to July 1996 were evaluated by ultrasound scanning with graded compression. Fifteen patients were identified as having enlarged mesenteric lymph nodes with normal appendix, and thirteen of them also had evidence of thickened terminal ileum. Clinical symptoms, signs and laboratory findings were carefully evaluated. Stool culture was performed on a blood agar plate at 37°C, then on a MacConkey agar plate. For

isolation of *Salmonella* spp., *Salmonella*-shigella and Selenite F broth were used. Stool was inoculated on a cefsulodin-irgasan-novobiocin (CIN) plate at 25 °C for isolation of *Yersinia* spp. and on a Campy-BAP at 42 °C with microaerophilic environment (5% O₂, 10% CO₂, and 85% N₂) for isolation of *Campylobacter* spp. In addition, stool examination for parasite and leukocyte, Widal test, and serology for Epstein-Barr virus were performed for other possible causes. Colonoscopy was performed in 12 of the 15 patients and multiple biopsies were taken at terminal ileum and at the site of lesion if presented. It was not possible to perform colonoscopy in three patients due to the following reasons: pregnancy, patient's refusal and a technical problem. Of the multiple biopsy specimens, two pieces were sent for tissue culture: one piece for acid-fast bacilli, the other for *Yersinia* and *Campylobacter*. The rest were evaluated by pathologists after hematoxylin and eosin staining and Ziehl-Nelson staining for acid-fast bacilli. Patients were followed carefully with conservative treatment without antibiotics unless specific causes of mesenteric adenitis which need specific antibiotic treatments were identified from the studies described above.

RESULTS

1. Clinical Manifestations

Of 15 patients, 6 (40%) were male, and the average age was 29.9 (17~41) years. Diarrhea and fever were the leading associated symptoms and rebound tenderness was present during the course of the disease in only 4 cases (Table 1). Diarrhea varied in frequency (1~10 times a day) but was transient lasting no more than 3 days. Fever

Table 1. Initial symptoms and signs of mesenteric adenitis(n=15)

Symptoms and signs	No. (%) of cases
Diarrhea	12 (80)
Fever	11 (73)
Nausea / vomiting	4 (27)
Tenderness	15 (100)
Rebound tenderness	4 (27)

Table 2. The colonoscopic findings in mesenteric adenitis(n=12)

	No. (%) of cases
Active inflammation	9 (75)
Terminal ileum only	4 (33)
Terminal ileum + right side colon	4 (33)
Terminal ileum + whole colon	1 (8)
Inactive or normal findings	3 (25)

was usually transient lasting less than 2 days except for those cases diagnosed later as typhoid fever.

2. Laboratory findings

Leukocytosis was present in 4 patients (27%) and was usually mild with a highest value of 11,500/mm³. Stool leukocyte was present in 4 cases (27%) and stool parasite was not disclosed in any case. Four cases were positive for stool culture, 2 cases for *Y. enterocolitica* and 2 cases for non-typhoidal *Salmonella* serogroup D. Serology for Epstein-Barr virus was negative in all cases. Widal test was positive (1:2580) for O-antigen in one case where the blood culture was positive for *Salmonella typhi*.

3. Colonoscopy and histological findings

Findings of active inflammation, such as hyperemia, edema, erosion, ulcer, and hemorrhage were observed in 9 of 12 cases (75%). The terminal ileum was involved in all the 9 cases with active inflammation and concomitant involvement of the colon was observed in more than half of the patients (Table 2). One case (8%) showed inactive findings, such as pseudopolyps, and 2 cases (17%) showed normal findings.

Colonoscopy of the cases which were positive for *Y. enterocolitica* showed erosions, ulcerations, hyperemia, and edema on terminal ileum, cecum and ascending colon (Fig. 1). Colonoscopy of a case which was positive

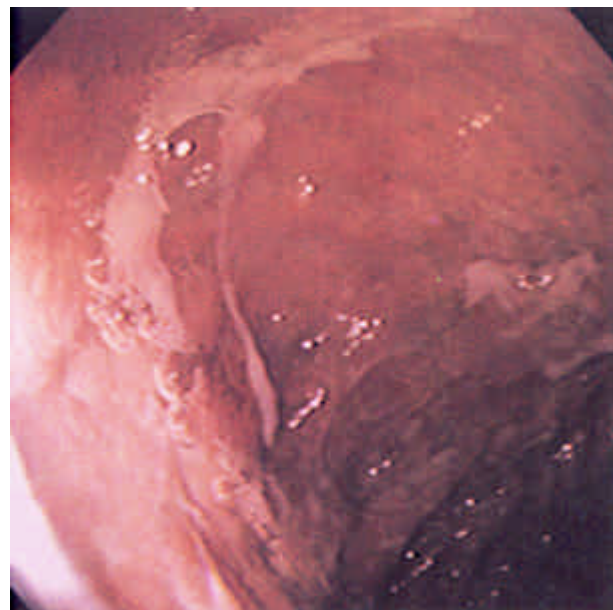


Fig. 1. Colonoscopic findings of *Yersinia* enteritis associated with mesenteric adenitis. Geographic mucosal hyperemia and erosions can be seen on the terminal ileum.

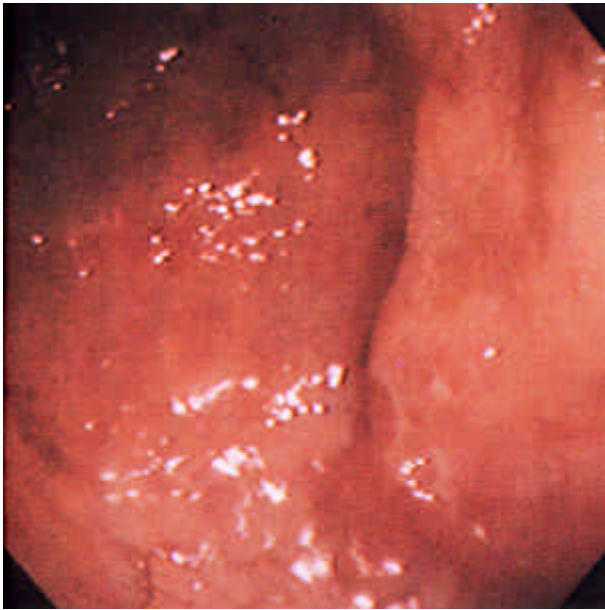


Fig. 2. Colonoscopic findings of *Salmonella* enteritis associated with mesenteric adenitis. Diffuse mucosal hyperemia and multiple shallow mucosal erosions can be seen on the terminal ileum.

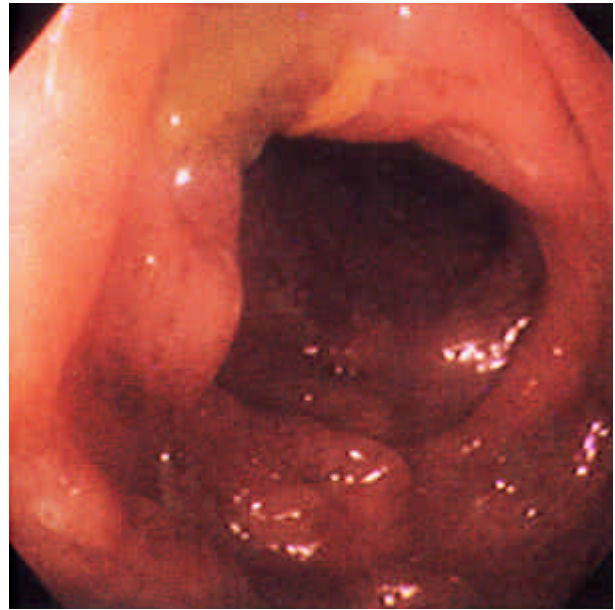


Fig. 3. Colonoscopic findings of typhoid fever associated with mesenteric adenitis. Multiple ulcers can be seen mainly on transverse direction and the surrounding mucosa shows edema and hemorrhage.

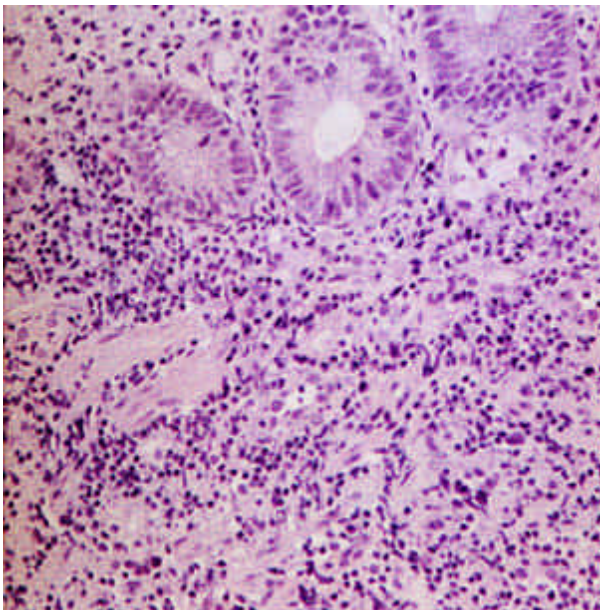


Fig. 4. Histologic findings of *Yersinia* enteritis. Active inflammation associated with massive lymphoid aggregation and histiocyte collection can be seen (H&E, ×200).

for non-typhoidal *Salmonella* serogroup D showed similar findings confined to the terminal ileum (Fig. 2). The cases which were diagnosed as tuberculosis showed geographic ulcerations and hyperemia combined with surrounding hypertrophic changes. The case of typhoid fever showed

diffuse mucosal edema and multiple ulcers mainly on transverse directions (Fig. 3).

Two cases were diagnosed as tuberculosis by histological examination, one case showed granuloma formation with caseating necrosis and acid-fast bacilli was demonstrated in the other. Active inflammation with lymphocyte aggregation and massive histiocyte collection was observed from the case diagnosed as *Yersinia* enterocolitis (Fig. 4). Pathognomonic findings were not demonstrated in other cases. Tissue culture for acid-fast bacilli and *Yersinia* failed to demonstrate the causative organisms in all cases.

4. Clinical courses

From the results described above, diagnosis was made for 7 of 15 cases (47%): two cases of *Y. enterocolitica* infection, two cases of non-typhoidal *Salmonellosis*, two cases of tuberculosis, and a case of typhoid fever. Etiology of the remaining eight cases remained unknown (Fig. 5).

The patients with tuberculosis were treated successfully with anti-tuberculosis agents. The patient with typhoid fever was treated successfully with ciprofloxacin. Antibiotics were not given to those cases other than described above, and only supportive treatments, such as hydration and anti-spasmodics, were done. All the patients included in this study improved and were cured substantially.

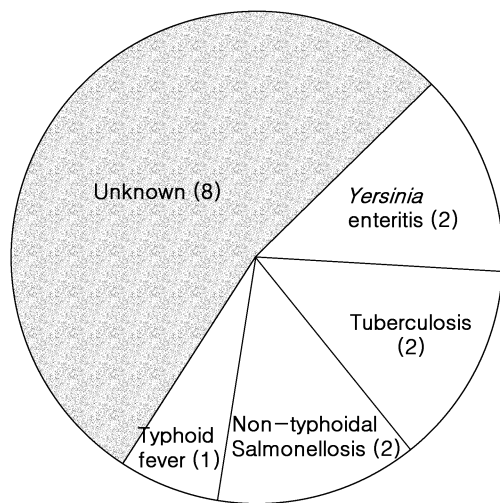


Fig. 5. Etiology of mesenteric adenitis in Korean adults (n=15)

DISCUSSION

Mesenteric adenitis, the most frequent condition mimicking acute appendicitis, is one of the common medical conditions that presents with acute right lower abdominal pain (2). In a report from the post-antibiotic era, 20 of 93 (22%) patients undergoing appendectomy for suspected appendicitis had postoperatively diagnosed mesenteric adenitis (12). However, the use of ultrasound scanning with graded compression in recent years has made the preoperative differential diagnosis of acute appendicitis from mesenteric adenitis possible. In a recent report, 8.2% of patients (14/170) who underwent ultrasonographic examination for clinical suspicion of acute appendicitis were diagnosed with mesenteric adenitis (4).

Patients with mesenteric adenitis have illnesses clinically indistinguishable from acute appendicitis (13). However, presence of diarrhea which occurs rarely in patients with appendicitis but occurs in 50 to 100% of patients with mesenteric adenitis (9,14,15) may be a sign favoring the diagnosis of mesenteric adenitis and terminal ileitis. In our study, 80% of patients experienced diarrhea which is similar to previous studies. Rebound tenderness is reported as a frequent sign of mesenteric adenitis in foreign studies (14), but our results indicate that 73% of patients did not show rebound tenderness during the course of their disease. Based on our data, we suggest that the presence of diarrhea and absence of rebound tenderness could be used as clinical parameters in distinguishing mesenteric adenitis from acute appendicitis.

In western countries, the cause of mesenteric adenitis in adults is reported to be caused by *Yersinia* spp. in

most cases. *Y. enterocolitica*, the most common cause of mesenteric adenitis in western countries, is reported to produce a spectrum of disease, including acute enterocolitis, terminal ileitis, as well as mesenteric adenitis (1). *Y. pseudotuberculosis*, on the other hand, commonly infects animals and is a less frequent cause of human disease (1). When it infects humans, it usually produces mesenteric adenitis, especially in older children and adults (1). According to the studies in which the diagnosis of mesenteric adenitis was confirmed postoperatively, *Y. enterocolitica* was cultured in 63~75% of patients (16). In another report, *Y. enterocolitica* was cultured in 8 out of 9 patients (89%) who were diagnosed with mesenteric adenitis by ultrasonography (4). Our data shows a much lower culture rate of *Y. enterocolitica* (12%) than western data: we speculate that the low culture rate may be due to geographic difference in the prevalence of *Y. enterocolitica* (8, 9).

In contrast to adults, the enlarged mesenteric lymph nodes in children is associated with a variety of medical and surgical conditions in symptomatic children and is occasionally seen in asymptomatic children (3). About a half of the children with enlarged mesenteric lymph nodes are reported to have abdominal pain or gastroenteritis of unknown origin and a quarter of them are reported to have appendicitis (3). Some other conditions such as adnexal torsion, Rotavirus enteritis, neutropenic colitis, leukemia, pelvic inflammatory disease, and Staphylococcal pneumonia have been reported to cause the enlargement of mesenteric lymph nodes, and 4% of asymptomatic children are also reported to have enlarged mesenteric lymph nodes (3).

Korea is an endemic area of tuberculosis and it is not surprising to find cases of tuberculosis in patients with mesenteric adenitis. In contrast to western countries where only sporadic cases of mesenteric adenitis caused by tuberculosis are reported (1), we were able to identify two cases of tuberculosis from 15 cases of mesenteric adenitis. Since tuberculous enterocolitis affects the ileocecal region most frequently (17), it is not unusual to find mesenteric adenitis and terminal ileitis caused by tuberculosis if the high prevalence rate of tuberculosis in Korea is to be considered. *Salmonella* spp. are known to be associated with acute enterocolitis and cause abdominal pain that mimics acute appendicitis (18), but it had not been considered as a causative agent of mesenteric adenitis in western countries. We had two cases of mesenteric adenitis caused by non-typhoidal *Salmonella* and a case of *Salmonella typhi*, suggesting the significant etiologic role of these microorganisms in the development of mesenteric adenitis in Korea. The etiology of 53% of our patients remained unknown despite the intensive work. Although this phenomenon may be

explained by false negatives in our culture results, causes which were not considered at the beginning of the study, such as viral origin other than Epstein-Barr virus, should be considered as contributing factors. It is not surprising that we did not find any case of infectious mononucleosis because none of our patients had evidence of enlarged or inflamed tonsils, which usually occur in patients with infectious mononucleosis (6).

Ultrasonographic evaluation using graded compression is reported to be a confident tool in the diagnosis of acute appendicitis or enlarged mesenteric lymph nodes (19). Puylaert screened 170 consequent patients with clinical suspicion of acute appendicitis by ultrasonography without missing any case of acute appendicitis (19). However, we recently experienced two cases of perforated appendicitis which was initially diagnosed as mesenteric adenitis and normal appendix by ultrasonography. These patients had prolonged fever and abdominal pain that did not subside after two weeks and it was confirmed at the operation field that what was thought to be enlarged mesenteric lymph nodes were actually localized abscess caused by perforated appendicitis. Therefore, a clinician should not solely depend on the results of ultrasonography in differential diagnosis of the patients presenting with right lower quadrant abdominal pain: the possibility of misdiagnosing the patients should always be considered with ultrasonography alone and careful clinical evaluation should always be matched to sonographic findings.

Thirteen of 15 patients included in our study also had evidence of terminal ileitis in addition to ultrasonographically enlarged lymph nodes. There are only a few reports that evaluated the terminal ileum in patients with mesenteric adenitis (9, 20), and the need for an evaluation of terminal ileum has been raised. It was reasonable to evaluate terminal ileum by colonoscopy because abnormalities are reported to be confined to distal 20 cm of terminal ileum and radiologically normal colon and terminal ileum may show evidence of inflammation by colonoscopy (9). However, even after intensive histological and microbiological studies, we were not able to define the etiology by colonoscopy except for those diagnosed later as tuberculous colitis in which gross and microscopic findings gave definite clues to diagnosis. Therefore, we suggest that colonoscopy should be reserved for those patients who are suspected of having tuberculosis, for those who present with chronic symptoms or for those who show prolonged disease course.

All of our patients except for those who needed specific therapy, anti-tuberculosis agents for tuberculosis and ciprofloxacin for typhoid fever, improved spontaneously without receiving antibiotics. Mesenteric adenitis is reported to be a self-limited disease and antibiotics are

not needed unless patients are severely ill and show signs of septicemia (1). Since none of our patients, except for the patient with typhoid fever, showed signs of septicemia, it was reasonable not to give antibiotics to patients with mild symptoms.

In conclusion, the etiology of mesenteric adenitis in Korean adults seems to be different from that of western countries. Furthermore, mesenteric adenitis in Korean adults is a clinical syndrome, frequently found in a relatively young age group, which improves spontaneously unless specific antimicrobial agents are indicated by microbiological tests, such as tuberculosis or typhoid fever.

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