

Abdominal Pain in the Primary Care Setting

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The characteristics of and final diagnoses for patients presenting with abdominal pain were investigated. This retrospective study examined 556 charts of patients 18 years of age and older who presented over a two-year period to three family practice offices. The charts were abstracted for demographic factors, symptoms, physical findings, laboratory data, final diagnosis, and number of visits for abdominal pain. The final diagnosis was documented by radiologic, laboratory, surgical, or pathologic specimen confirmation except for the following diagnoses: acute gastroenteritis, pelvic inflammatory disease, irritable bowel syndrome, and abdominal pain, etiology undetermined. No cause for the abdominal pain was found for approximately one half of the cases. Most patients were female even when gynecologic problems were excluded. Nine percent of abdominal pain patients were admitted to the hospital for evaluation or surgery. An average of 1.8 tests were ordered per patient. Almost one half of the patients were seen only once for the problem. The results suggest that a large percentage of the patients who present with abdominal pain have a self-limited illness for which no definitive diagnosis is found.

Abdominal pain as a presenting symptom in the ambulatory setting has not been well described. Brewer et al¹ described individuals aged 15 years and older who presented with abdominal pain to an emergency room. Younger patients predominated, with no documented diagnosis present in nearly one half the cases. Over 25 percent were admitted to the hospital for treatment (surgical and nonsurgical) or observation. The results may be unrepresentative because of the unique population that seeks care in emergency rooms. Individuals may be referred by a physician because of severity of illness, or individuals may self-refer because of their own perceived severity of illness.

Adelman and Metcalf² described a group of patients who presented to a university family practice clinic with the complaint of abdominal pain. Patients presenting with abdominal pain in that setting were also young and had no apparent cause for their symptoms. There were more than twice as many female as male patients. The few office visits, which may be indicative of the duration of illness,

suggest that the symptom of abdominal pain often was self-limited. The patients were young, and younger individuals have fewer "organic" diseases^{1,3} such as tumors and diverticular disease. Because the characteristics of the patients presenting to this university family practice center may make it difficult to generalize the results to other settings, this study was extended to two other practice sites to broaden the population examined.

METHODS

The charts from three different practice sites of the Department of Family Practice, University of Iowa, were used for this study. The University of Iowa Family Practice Center (FPC) is located in Iowa City, a midwestern university community with a population of approximately 50,000. This site was described in the previous study.² The second site is the Oakdale Family Practice Center, located outside the city limits and drawing its patients from nearby rural communities. The third site is the Williamsburg Family Practice Center, the primary medical facility for a community of 2,000 and the surrounding areas.

A retrospective study was conducted covering the period from July 1976 to October 1978. Charts of patients with symptoms or diagnoses that would probably have

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presented with abdominal pain were identified from the department's computerized record system, which utilized the International Classification of Health Problems in Primary Care (ICHPPC) coding system. The following ICHPPC categories were identified: (1) abdominal pain, (2) diseases of the gastrointestinal system, (3) gastrointestinal tumors, (4) diseases of genitourinary system, (5) symptoms or signs of the gastrointestinal or genitourinary system, and (6) intestinal disease, proven or presumed infection, viral, or unknown. All patients aged 17 years or less were excluded. By this method approximately 2,000 charts were identified.

An experienced medical abstractor reviewed the charts. If the patient presented with a complaint of abdominal pain, the chart was abstracted for demographic factors, symptoms, physical findings, laboratory data, initial diagnosis, and subsequent follow-up for the symptom of abdominal pain. The final diagnosis was documented by radiologic or laboratory studies, or surgical or pathologic specimens with the following exceptions: (1) acute gastroenteritis, presumed viral, (2) pelvic inflammatory disease, (3) irritable bowel syndrome, and (4) abdominal pain, etiology undetermined. If the patient reported a previous workup for a similar episode of abdominal pain, the diagnosis reported by the patient was accepted without documentation. If not documented, the final diagnosis was recorded as abdominal pain, etiology undetermined. The initial 50 charts were reviewed by both the author and abstractor. Twenty percent of the remaining charts were reexamined by the author. Agreement between abstractor and author was greater than 99 percent. In addition, the author reviewed all final diagnoses. More complete details of the methods are reported elsewhere.²

One chart was excluded from final analysis. The patient had a documented intestinal parasitic infection in addition to abdominal pain, etiology undetermined. Whether the signs and symptoms were due to the infestation or were of undetermined etiology was uncertain.

The data were analyzed using univariate statistical analyses (*t* tests, chi-square tests, and frequencies) to describe the sample.⁴ Age was used as both a continuous and categorical (18 to 44 years, 45 to 64 years, 65 years and older) variable in the analyses. Unless specifically stated, age was considered a categorical variable.

RESULTS

The demographic characteristics of the sample are displayed in Table 1. Female patients predominated at all sites, although the ratio decreased from approximately 4:1 at the FPC to 3:2 at Williamsburg. Despite the exclusion of gynecologic conditions, such as pelvic inflam-

TABLE 1. DEMOGRAPHIC CHARACTERISTICS OF THOSE INDIVIDUALS WHO PRESENTED WITH ABDOMINAL PAIN

Characteristic	No. (%)
Practice site	
Iowa City	133 (23.9)
Oakdale	162 (29.1)
Williamsburg	261 (46.9)
Sex	
Male	170 (30.6)
Female	386 (69.4)
Years of education	
Missing	166 (29.9)
1 to 8	10 (1.8)
9 to 12	163 (29.3)
13 to 16	172 (30.9)
17+	45 (8.1)
Marital status	
Missing	18 (3.2)
Single	104 (18.7)
Married	371 (66.7)
Separated	4 (.7)
Divorced	40 (7.2)
Widowed	19 (3.4)
Age and sex distribution total (years)	
18 to 44	416 (74.8)
45 to 64	89 (16.0)
>65	51 (9.2)
Male (years)	
18 to 44	102 (60.0)
45 to 64	40 (23.5)
>65	28 (16.5)
Female (years)	
18 to 44	314 (81.3)
45 to 64	49 (12.7)
>65	23 (6.0)

matory disease, women still outnumbered men by the ratio of approximately 2:1 ($P < .05$). The average ages of the patients who presented with abdominal pain to the FPC, Oakdale, and Williamsburg were 32 years, 35 years, and 41 years, respectively. Combining data from all three centers, men were significantly older ($P < .001$) than women, with average ages of 42 and 34 years, respectively. The age-sex distribution of those individuals who presented with abdominal pain was similar to the age-sex distribution of all individuals who used each office.

Of the 556 patients presenting to these offices with the complaint of abdominal pain, 434 (78 percent) were coming for the first time; 122 (22 percent) patients had been seen previously. In Figure 1 is shown the duration of pain before the patient presented for the evaluation of abdominal pain. Ninety-one percent presented within three months of the onset of their pain. Approximately 60 percent presented within one week of the onset of their pain. There was no difference by sex or age in the duration of abdominal pain prior to presentation for evaluation.

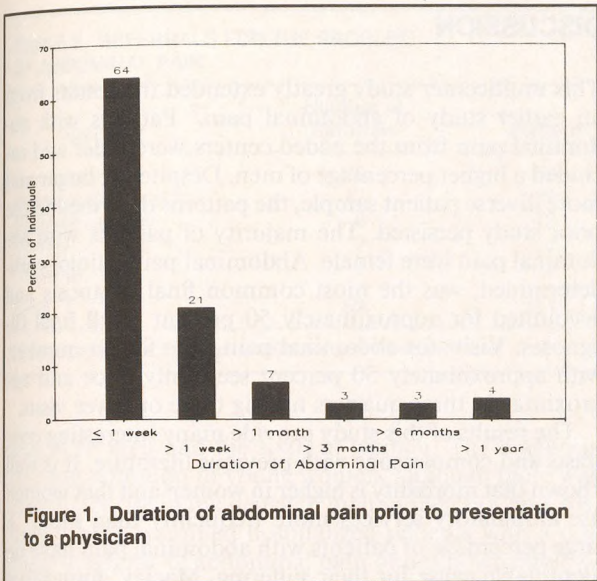


Figure 1. Duration of abdominal pain prior to presentation to a physician

TABLE 2. LOCATION OF ABDOMINAL PAIN

Location of pain	No. (%)
Lower abdomen (below umbilicus)	203 (44.9)
Upper abdomen (above umbilicus)	158 (35.0)
Generalized (above and below umbilicus)	47 (10.4)
Flank (alone or in combination with another location)	31 (6.9)
Periumbilical	13 (2.9)
Missing	104

pitalized and nonhospitalized patients separately, however, there was no significant difference in the number of tests ordered. Older patients also underwent more tests ($P < .01$).

The diagnoses of abdominal pain, etiology undocumented; acute gastroenteritis, presumed viral; urinary tract infection; irritable bowel syndrome; and pelvic inflammatory disease accounted for approximately 80 percent of the final diagnoses in the 556 patients studied (Table 4). Of these major diagnoses, the diagnoses of abdominal pain, etiology undocumented, and urinary tract infection were not associated with age, while the diagnoses of acute gastroenteritis, irritable bowel syndrome, and pelvic inflammatory disease were made more frequently in the younger age groups.

Referrals to surgical subspecialties predominated, accounting for 89 percent of the referrals (Table 5). There was no significant difference by either age or sex.

The location of the abdominal pain upon presentation is displayed in Table 2. Although the lower abdomen is the most common region for pain, the epigastrium was the single most common site of pain. One hundred thirty-three (29 percent) stated that the epigastric area, alone or in combination with another location, was the site of their pain. There was no difference by age in the location of abdominal pain. Female patients presented with lower abdominal pain more frequently than male patients ($P < .001$), even when gynecologic diagnoses were excluded ($P < .01$). The upper abdomen and periumbilical area were more frequent sites of pain in men.

Approximately 80 percent of the patients were seen three or fewer times for their abdominal pain (Figure 2). The average number of visits for the problem of abdominal pain was 2.4. There was no difference in the mean number of visits by sex. Although there was a positive correlation between age and number of visits ($P < .01$), when the offices were examined individually, the correlation was significant only at Oakdale.

The laboratory and x-ray tests obtained and the percentage of tests that were normal are listed in Table 3. A total of 973 tests were performed, which represents 1.8 tests per individual. Twenty-seven percent had no tests performed, and approximately 75 percent had fewer than three tests performed. An abnormal test was not always related to the final diagnosis. Many coincidental abnormalities, such as anemia, crystals in the urine, proteinuria, and intestinal polyps, were found. Overall, men underwent a significantly higher average number of tests (2) than women (1.6) ($P < .05$). When examining the hos-

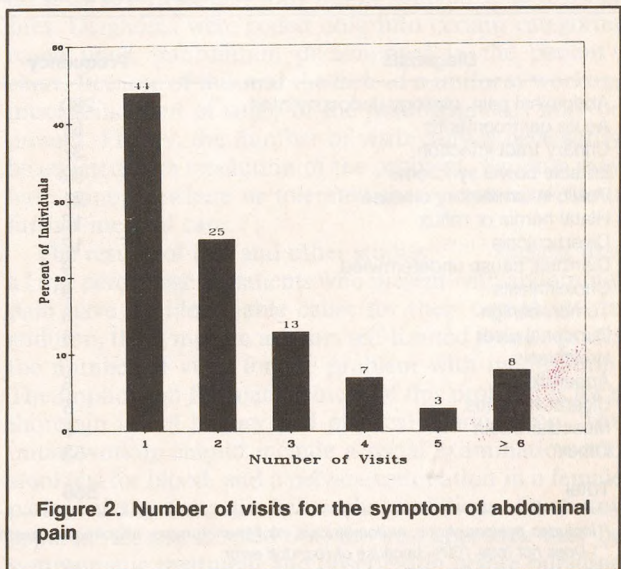


Figure 2. Number of visits for the symptom of abdominal pain

TABLE 3. UTILIZATION OF LABORATORY AND X-RAY TESTS BY INDIVIDUALS WHO PRESENT WITH ABDOMINAL PAIN

Test	Total Performed	Percent Normal
Sedimentation rate	24	92
Hemoglobin/hematocrit	133	96
White blood cell count	147	71
Liver function tests	20	85
Urinalysis	260	75
Upper gastrointestinal tract x-ray series	68	62
Barium enema	43	63
Oral cholecystogram	40	75
Sigmoidoscopy	38	66
Intravenous pyelogram	8	75
Stool for ova and parasites	12	100
Stool occult blood/hemocult	162	84
Pregnancy test	13	77
Sonogram	5	60
Total	973	

Fifty-one (9 percent) individuals who presented with abdominal pain were admitted to the hospital at some time for their problem. Twenty-six (51 percent) of the 51 admitted underwent surgery. Men were more frequently admitted to the hospital ($P < .05$). Older individuals were also admitted more frequently ($P < .01$). There was no significant difference by sex or age with respect to frequency of surgery.

DISCUSSION

This multicenter study greatly extended the results from an earlier study of abdominal pain.² Patients with abdominal pain from the added centers were older and included a higher percentage of men. Despite the larger and more diverse patient sample, the patterns described in the prior study persisted. The majority of patients with abdominal pain were female. Abdominal pain, etiology undetermined, was the most common final diagnosis and accounted for approximately 50 percent of all final diagnoses. Visits for abdominal pain were few in number, with approximately 50 percent seen only once and approximately three quarters having three or fewer visits.

The results of this study provide many interesting contrasts and comparisons with previous literature. It is well known that morbidity is higher in women and that women use ambulatory services more frequently than men.⁵ A large percentage of patients with abdominal pain have no identifiable cause for their suffering. Maclay⁶ found that 50 percent of patients presenting in an outpatient setting had "functional" complaints. In other studies of patients with pain, such as those with headache or backache, a high percentage of pain, undetermined etiology, or pain of psychogenic origin was noted.^{3,7,8}

Results of the present study also agree with those of other studies on abdominal pain carried out in a variety of settings. Rang et al⁹ examined unexplained abdominal pain as a hospital discharge diagnosis. Unexplained abdominal pain was the tenth most common cause for ad-

TABLE 4. FINAL DIAGNOSES FOR THE PRESENTING SYMPTOM OF ABDOMINAL PAIN

Diagnosis	Frequency	Percent	Cumulative Percent	Brewer et al ¹ Study Percent
Abdominal pain, etiology undocumented	280	50.4	50.4	41.3
Acute gastroenteritis	51	9.2	59.5	6.9
Urinary tract infection	37	6.7	66.2	5.2
Irritable bowel syndrome	32	5.8	71.9	—
Pelvic inflammatory disease	21	3.8	75.7	6.7
Hiatal hernia or reflux	13	2.3	78.1	—
Diverticulosis	12	2.2	80.2	—
Diarrhea, cause undetermined	9	1.6	81.8	—
Cholelithiasis	9	1.6	83.5	3.7
Tumor, benign	8	1.4	84.9	—
Duodenal ulcer	8	1.4	86.3	2.0
Urolithiasis	7	1.3	87.6	4.3
Appendicitis	6	1.1	88.7	4.3
Ulcerative colitis	5	.9	89.6	—
Muscular strain	5	.9	90.5	—
Other*	53	9.5	100.0	—
Total	556	100.1**		

* Includes pyelonephritis, endometriosis, malignant tumors, esophagitis, gastritis, gastric ulcer, hepatitis, spontaneous abortion, anxiety, depression
 ** Does not total 100% because of roundoff error

TABLE 5. REFERRALS FOR THE PROBLEM OF ABDOMINAL PAIN

Specialty	Number of Referrals	Percent
General surgery	26	50
Obstetrics/gynecology	17	33
Gastroenterology	6	12
Urology	2	4
Oncology	1	2
Total	52	101*

* Percentages do not add up to 100% because of roundoff error

mission in men and the sixth in women. The diagnosis was most common in young women, although there was a secondary rise in incidence in men in their 60s and 70s. Sarfeh¹⁰ also examined hospitalized patients with a discharge diagnosis of abdominal pain of unknown etiology and found that most patients were female (72 percent). In addition, no particular age group was at risk.

Brewer et al¹ examined 1,000 consecutive patients who presented to a university emergency room with nontraumatic abdominal pain. The methodology of that study and the present one share common features that allow comparisons to be made. Both were retrospective chart studies on an ambulatory population, where documentation of the final diagnosis was required. Brewer et al reported that 41 percent of patients presenting with abdominal pain had no documented disease. Abdominal pain of unknown cause, gastroenteritis, pelvic inflammatory disease, and urinary tract infection accounted for approximately 60 percent of all diagnoses. In the present study these four diagnoses accounted for approximately 70 percent of all diagnoses. Further comparisons by final diagnoses for both studies are displayed in Table 4.

In Brewer's study 27 percent were admitted to the hospital, with 55 percent of those admitted ultimately undergoing surgery. In the present study only 12 percent were admitted, with 38 percent of those admitted undergoing surgery. A selection bias may explain the difference encountered. Emergency rooms may select for sicker individuals who are either referred to the emergency room because of their severity of illness or who go there directly because of their own perceived severity of illness. While Brewer found that older individuals were more likely to be operated upon, no such tendency was demonstrated in the present study.

Although the assumption that the number of visits correlates with the duration of the disease may be questioned, several studies suggest that the symptom of abdominal pain is self-limited. Gregory et al¹¹ questioned patients six years after their initial visits for abdominal pain, etiol-

ogy undetermined, by upper gastrointestinal tract x-ray examination. In approximately two thirds of the patients the pain had resolved. Marton et al¹² followed patients who had undergone an upper gastrointestinal tract x-ray series primarily for abdominal pain. In approximately two thirds of the patients the pain resolved within four to six months. Jess¹³ found that in 6,097 patients admitted to a hospital for acute abdominal pain, 43 percent had non-specific abdominal pain that was relieved by no definitive treatment within several days.

Only one other study has examined location of abdominal pain. Thompson and Heaton¹⁴ surveyed 301 apparently healthy individuals. Of the 62 individuals who reported six or more episodes of abdominal pain, one half experienced lower abdominal discomfort. The present study also found that almost one half had lower abdominal pain. It is unclear why women presented more frequently with lower abdominal pain. That this relationship persisted despite the exclusion of gynecologic diagnoses may reflect underdiagnosis of gynecologic problems such as mittelschmerz or transient ovarian problems such as cysts.

No other studies have reported the number of laboratory or x-ray tests performed in the workup of abdominal pain. The reason why men obtained more tests than women is not apparent. It makes intuitive sense that as one grows older and organic diseases (eg, diverticulosis, malignancies) become more common, more tests would be performed to exclude these diseases. The most appropriate workup for the complaint of abdominal pain needs further study. For the symptom of dyspepsia, Goodson et al¹⁵ suggested that fewer upper gastrointestinal x-ray series are required.

While these findings characterize the patients seen at these three offices, they may not be generalizable to other sites. Diagnoses were coded only into certain categories based upon information documented in the patient's chart. Because of this and the lack of a uniform workup, misclassification of some of the final diagnoses may be present. Finally, the number of visits cannot necessarily be equated with resolution of the problem. Patients may have gone elsewhere or tolerated the symptom without further medical care.

The results of this and other studies^{1,11-13} suggest that a large percentage of patients who present with abdominal pain have no identifiable cause for their complaint. In addition, the symptom appears self-limited if one equates the number of visits for the problem with its duration. The implication for management of this problem is for a thorough initial history and physical examination. The initial workup should include a rectal examination and stool test for blood, and a pelvic examination in a female patient if she has pain below the umbilicus. Once any apparent disease is ruled out, the best approach may be symptomatic treatment and observation before pursuing

a more lengthy and expensive workup. In the case of dyspepsia, Goodson et al¹⁵ have shown this approach to be reasonable. Persistent symptoms of greater than one to two weeks' duration should probably be investigated further. This general approach needs to be tested in a prospective study.

At present further work is under way to answer some of the questions raised by this study. A national data set is being analyzed to determine whether the experience in Iowa can be extended to other settings. Further studies are needed to characterize fully the common symptom of abdominal pain and determine the best approach to its diagnosis and management.

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