Evaluation of Patients of Acute Pain in Abdomen Attending the Emergency Medicine Department at SSG Hospital, Baroda

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Abstracts: Background: Present study was aimed to study the clinical pattern, etiology and management outcomes of patients presenting with acute pain in abdomen in the Emergency Medicine Department (EMD), SSG Hospital. **Aims:** 1) To study Acute Pain in Abdomen, and various clinical presentation of acute abdominal pain in patients attending casualty at S.S.G.hospital. 2) to compare clinical judgment with radiological, intraoperative, and histopathological findings. **Methods:** A prospective observational study of total 700 patients was carried out from January 2013 to October 2013. All patients of acute pain in abdomen, except pregnant women & penetrating /blunt abdominal injury, comes to EMD in the casualty, at SSG Hospital were included. **Results:** Majority of female patients presented with generalised, colicky (predominantly) or dull aching pain, in mild to moderate intensity, within three days of onset of pain; while majority of male patients presented with generalised, dull aching (predominantly) or colicky pain, in severe to excruciating intensity, after the three days of onset of abdominal pain. **Conclusion:** In our study, majority of patients presenting to EMD with Abdominal Pain were male and belong to age group of 21-50 years. Patients with generalised abdominal pain and Left Upper Quadrant pain were found to be having Nonspecific Abdominal Pain. Patients diagnosed as Acute Pancreatitis had come with pain in periumbilical area, Epigastric region, & back; while patients with Right Upper Quadrant, Right Lower Quadrant and Flank pain turned out to be Acute Cholecystitis, Acute Appendicitis, and Ureteric Colic, respectively. Patients with generalised abdominal pain, nausea, vomiting and fever were found to be having Acute Appendicitis. Patients diagnosed as Bowel Obstruction had come with Abdominal Distension and Constipation; with anorexia, were diagnosed Nonspecific Abdominal Pain; with jaundice, were diagnosed Liver Abscess; with burning micturition, all were diagnosed Nonspecific Abdominal Pain. [Patel S NJIRM 2014; 5(5):57-63]

Key Words: Abdominal Pain, Acute Abdomen, USG, CT scan.

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Introduction: The term acute abdominal pain generally refers to previously undiagnosed pain that arises suddenly and is of less than 7 days' (usually less than 48 hours') duration. It may be caused by a great variety of intraperitoneal disorders, many of which call for surgical treatment, as well as by a range of extra peritoneal disorders, which typically do not call for surgical treatment. Abdominal pain that persists for 6 hours or longer is usually caused by disorders of surgical significance. The primary goals in the management of patients with acute abdominal pain are (1) to establish a differential diagnosis and a plan for confirming the diagnosis through appropriate imaging studies, (2) to determine whether operative intervention is necessary, and (3) to prepare the patient for operation in a manner that minimizes perioperative morbidity and mortality.

In many cases, these goals are easily accomplished. On occasion, however, the evaluation of patients with acute abdominal pain can be one of the most difficult challenges in Emergency Medicine. Most clinicians depend on recognition of specific patterns and sequences of symptoms and signs to determine the need for further testing and to make decisions regarding the timing of operation; however, at least one third of patients with acute abdominal pain exhibit atypical features that render pattern recognition unreliable.

A careful and methodical clinical history should be obtained. Key features of the history include the dimensions of pain (i.e., mode of onset, duration, frequency, character, location, chronology, radiation, and intensity), as well as the presence or absence of any aggravating or alleviating factors and associated symptoms.

In the physical examination of a patient, the amount of information that can be obtained is directly proportional to the gentleness and thoroughness of the examiner. The physical examination begins with a brief but thorough evaluation of the patient's general appearance and ability to answer questions. The degree of obvious pain should be estimated. The patient's position in bed should be noted.

Laboratory tests and imaging studies, if used in the correct clinical setting, they can confirm or exclude specific diagnoses suggested by the history and the physical examination.

The aim of this study is to study the etiology of pain in abdomen in patients requiring operative management; Symptomatic presentation of various diseases presenting as acute abdomen in Emergency; To observe the role of radiological investigation in diagnosis of such patients.

Methods: This study was conducted in the EMD of Sir Sayajirao General Hospital from January 2013 to October 2013.This is a prospective, observational study conducted in the patient with abdominal pain presenting at the emergency medicine, SSG Hospital, Baroda. All patients of acute pain in abdomen, excluding pregnant women & penetrating /blunt abdominal injury who comes to EMD in the casualty, at SSG Hospital, were included. After complete history taking, thorough general examination was done. Detailed Clinical examination including per abdomen examination, cardiovascular examination, respiratory examination, central nervous system examination and per rectal examination was carried out in each case followed by routine blood & urine investigations. Abdominal sonography, radiological investigations including X rays, CT scan (If required) were done according to case merit. Treatment and observations were done. All apparent causes of pain abdomen were recorded, tabulated and analyzed for interpretation by using appropriate statistical values.

Results: A total of 700 patients (524 male & 176 female) were enrolled in the study. The patients in the study belonged in the range of 11 years to 80 years.

Table 1: Presentation of Various Diseases On The Basis Of Duration of Abdominal Pain & Site Of Abdominal Pain

Diagnosis	PRESENTATION OF VARIOUS DISEASES ON THE BASIS OF DURATION OF ABDOMINAL PAIN		PRESENTATION OF VARIOUS DISEASES ON THE BASIS OF SITE OF ABDOMINAL PAIN							
	Less than 3 days	More than 3 days	Generalised Percentage (No. Of patients)	RUQ Percentage (No. Of patients)	LUQ Percentage (No. Of patients)	RLQ Percentage (No. Of patients)	Periumbilical Percentage (No. Of patients)	Flanks Percentage (No. Of patients)	Epigastrium Percentage (No. Of patients)	Back Percentage (No. Of patients)
Nonspecific abdominal pain	7% (28)	64% (176)	46% (133)	26% (33)	34% (13)	9% (12)	15% (8)	4% (1)	11% (3)	20% (1)
Acute Appendicitis	27% (116)	2% (6)	2% (5)	1% (2)	0 (0)	86% (114)	2% (1)	0 (0)	0 (0)	0 (0)

Hollow Viscus Perforation	26% (111)	4% (11)	26% (74)	5% (7)	29% (11)	2% (1)	30% (16)	0 (0)	37% (13)	0 (0)
Acute Cholecystitis	14% (60)	0 (0)	1% (2)	44% (58)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Acute Pancreatitis	4% (19)	14% (39)	0 (0)	1% (1)	5% (2)	0 (0)	45% (26)	42% (11)	52% (14)	80% (4)
Intestinal obstruction	9% (40)	5% (13)	18% (52)	0 (0)	0 (0)	0 (0)	2% (1)	0 (0)	0 (0)	0 (0)
Ureteric Colic	6% (27)	0 (0)	1% (1)	0 (0)	24% (9)	3% (3)	0 (0)	54% (14)	0 (0)	0 (0)
Liver Abscess	4% (13)	5% (14)	1% (2)	19% (24)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Others	3% (12)	6% (15)	5% (17)	4% (5)	8% (3)	0 (0)	6% (3)	0 (0)	0 (0)	0 (0)
Total	61% (426)	39% (274)	41% (286)	19% (130)	6% (38)	19% (132)	8% (53)	3% (26)	4% (30)	1% (5)

Table 2: Presentation of Various Diseases On The Basis Of Associated Symptoms

	Non-specific pain	Appendicitis	Hollow Viscus Perforation	Chole-cystitis	Pancre-atitis	Bowel Obstruction	Colic	Others	Liver Abscess	Total
Abdominal Distension	14% 18	0 0	20% 25	0 0	6% 7	40% 50	0 0	2% 2	18% 23	18% 125
Nausea / Vomiting	27% 80	35% 110	13% 35	1% 3	1% 2	15% 46	8% 25	0 0	0 0	43% 301
Constipation	31% 24	0 0	0 0	0 0	0 0	69% 53	0 0	0 0	0 0	11% 77
Jaundice	29% 4	0 0	0 0	14% 2	0 0	0 0	0 0	14% 2	43% 6	3% 14
Fever	24% 55	52% 120	6% 14	2% 4	5% 12	0 0	0 0	4% 10	7% 15	33% 230
Anorexia	34% 60	6% 10	18% 32	0 0	15% 26	23% 40	0 0	3% 6	1% 3	25% 177
Burning Micturition	100% 5	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	5

Table 3: Presentation of Various Diseases On The Basis Of Characteristics Of Abdominal Pain

	Referred	Shifting	Non-significant	Tenderness	Guarding	Rigidity
Nonspecific abdominal pain	2% 3	0 0	39% 201	2% 4	3% 4	0 0
Acute Appendicitis	42% 70	9% 1	10% 51	58% 98	65% 91	22% 7
Hollow Viscus Perforation	1% 2	0 0	22% 120	7% 11	1% 2	28% 9
Acute Cholecystitis	34% 56	0 0	1% 4	0 0	0 0	0 0
Acute Pancreatitis	15% 26	37% 4	5% 28	21% 36	17% 23	41% 13
Intestinal obstruction	0 0	0 0	10% 53	2% 3	0 0	9% 3
Ureteric Colic	3% 5	27% 3	4% 19	5% 9	7% 9	0 0
Liver Abscess	0	0	0	0	0	0
Others	3% 5	27% 3	9% 46	5% 9	7% 9	0 0
Total	24% 167	2% 11	74% 522	24% 170	20% 138	5% 32

Table 4: Disease Diagnosed On The Basis Of Investigation

	Male	Female	Total
X ray	30% 155	12% 21	25% 176
USG	73% 383	64% 112	71% 497
CT Abdomen	10% 52	2% 4	8% 56

Significant X ray findings were air fluid levels in abdomen, gas under the diaphragm, and abnormal calcification.

Significant USG findings were intestinal obstruction (air fluid levels and dilated loops of bowel); intestinal perforation (pneumoperitoneum); biliary, renal, or ureteral calculi (abnormal calcifications); appendicitis (fecalith); chronic pancreatitis (pancreatic calcifications); acute pancreatitis (the so called colon cutoff sign); psuedocyst of pancreas (pancreatic cyst).

Discussion: Out of 700 patients, commonest age group is 21-30 years accounting for 22%, followed by 41-50 years (20%) and 31-40 years (19%).The study performed by Caterino S et al, "Acute abdominal pain in emergency surgery. Clinical epidemiologic study of 450 patients." reviewed that the largest number of patients involved in age groups 60-70 years (16.6%) and 20-30 years (14.2%). The study performed by Irvin TT et al, "Abdominal pain: a surgical audit of 1190 emergency admissions." reviewed that the largest number of presentation occurred in the age groups 10-29 years (31%) and 60-79 (29%).

Analysing the studies carried out, our study is also showing a predominance of the 21-30 years as the most common age group presented with Abdominal Pain in our study sample.

In our study, 46% of generalised abdominal pains were diagnosed as Nonspecific Abdominal Pain, 44% of Right Upper Quadrant pains were diagnosed as Acute Cholecystitis, 86% of Right Lower Quadrant pains were diagnosed as Acute Appendicitis, 45% of Periumbilical pains were diagnosed as Acute Pancreatitis, 33% of Left Upper Quadrant pains were diagnosed as Nonspecific Abdominal Pain, 52% of Epigastric pains were diagnosed as Acute Pancreatitis, 54% of Flanks pains were diagnosed as Ureteric Colic, 80% of pains in back of the abdomen were diagnosed as Acute Pancreatitis. The study performed by Mario Marino et al, "Acute Nonspecific Abdominal Pain: A Randomized, Controlled Trial Comparing Early Laparoscopy Versus Clinical Observation" reviewed that diagnoses in laparoscopy for acute right iliac or hypogastric abdominal pain, were appendicitis in 30%, Pelvic Inflammatory Disease in 13.2%, Carcinoid in 1.9%, other in 33.9%, no diagnosis in

20.7%; While diagnosis in observation for same complaints were appendicitis in 5.8%, Pelvic Inflammatory Disease in 15.6% other in 23.5% and no diagnosis in 54.9%. The study performed by Sarah L. Cartwright et al, "Evaluation of Acute Abdominal Pain in Adults" reviewed that right lower quadrant pain strongly suggests appendicitis. The study performed by Navarro Fernandez JA et al, "Validity of tests performed to diagnose acute abdominal pain in patients admitted at an emergency department. "reviewed that a significant diagnostic correlation between pain location in the right hypochondrium and a diagnosis with cholecystitis. This location was also significant for acute appendicitis (up to 74%).

Analysing the studies carried out, our study is also showing a predominance of the Acute Appendicitis in the patients presenting with Right Lower Quadrant Abdominal Pain, and Acute Cholecystitis in the patients presenting with Right Upper Quadrant Abdominal Pain in our study sample.

In our study, patients with nausea and vomiting, 35% were diagnosed acute appendicitis; with fever, 52% were diagnosed acute appendicitis; with anorexia, 34% were diagnosed Nonspecific Abdominal Pain; with abdominal distension, 40% were diagnosed Bowel Obstruction; with constipation, 53% were diagnosed Bowel Obstruction; with jaundice, 43% were diagnosed Liver Abscess; with burning micturition, all were diagnosed Nonspecific Abdominal Pain. The study performed by Sarah L. Cartwright et al, "Evaluation of Acute Abdominal Pain in Adults" reviewed that certain elements of the history and physical examination are helpful, e.g., constipation and abdominal distension strongly suggest bowel obstruction, whereas others are little value e.g., anorexia has little predictive value for appendicitis. The study performed by Navarro Fernandez JA et al, "Validity of tests performed to diagnose acute abdominal pain in patients admitted at an emergency department. "reviewed that a significant correlation between fever and viscera perforation. The study performed by Cardall T et al, "Clinical value of the total white blood cell count and temperature in the evaluation of patients with suspected appendicitis." reviewed that there was minimal statistical association between a temperature of >99 degrees F and the presence of appendicitis.

Analysing the studies carried out, our study is also showing a predominance of the constipation and abdominal distension in patients with Bowel Obstruction, significant correlation between fever with Hollow Viscus Perforation, but predominance of fever in patients with Acute Appendicitis as the most common etiology, in our study sample.

In our study, 24% of cases had shown tenderness, in which acute appendicitis (58%) diagnosed the most; 20% of cases had shown guarding, in which acute appendicitis (65%) diagnosed the most; 5% of cases had shown rigidity, in which acute pancreatitis (41%) diagnosed the most. The study performed by Eskelinen M et al, "Sex-specific diagnostic scores for acute appendicitis." reviewed that Independent predictors of acute appendicitis in males were tenderness, previous abdominal surgery, rebound, rigidity, location of pain at diagnosis, guarding, and body temperature. The other study performed by Eskelinen M et al, "Acute appendicitis in patients over the age of 65 years; comparison of clinical and computer based decision making." reviewed that acute abdominal pain at the right lower quadrant, with tenderness, rigidity, and increased body temperature is indicative of acute appendicitis in patients more than 50 years old. The another study performed by Eskelinen M et al, "Usefulness of history-taking, physical examination and diagnostic scoring in acute renal colic." reviewed that the most significant predictors of acute renal colic were urine, tenderness, renal tenderness, duration of pain and appetite.

Analysing the studies carried out, our study is also showing a predominance of tenderness, in patients with Acute Appendicitis and a significant correlation in patient with Ureteral Colic in our study sample.

In our study majority of patients (71%) were diagnosed with ultrasound examination of abdomen. Amongst all investigation X ray abdomen was useful in 25% of cases and 8% cases were diagnosed by Computed Tomography (CT) Abdomen. The study performed by Powers RD et

al,"Abdominal pain in the ED: stability and change over 20 years" showed that there was marked increase in the specificity of diagnoses, with only 24.9% in 1993 diagnosed as undifferentiated abdominal pain (UDAP) or Nonspecific Abdominal Pain. The study performed by Wade DS et al, "Accuracy of ultrasound in the diagnosis of acute appendicitis compared with the surgeon's clinical impression." reviewed that ultrasound-derived diagnosis of appendicitis had a sensitivity of 85.5%, a specificity of 84.4%, a positive predictive value of 88.3%, a negative predictive value of 80.1%, and an overall accuracy of 85.0%.The overall accuracy of ultrasonography in the diagnosis of appendicitis was statistically superior to that of the surgeon's clinical impression. The study performed by Lee SL et al, "Computed tomography and ultrasonography do not improve and may delay the diagnosis and treatment of acute appendicitis." reviewed that Migratory pain, physical examination, and initial leukocytosis remain reliable and accurate in diagnosing acute appendicitis. Neither CT nor USG improves the diagnostic accuracy or the negative appendectomy rate; in fact, they may delay surgical consultation and appendectomy. In atypical cases, one should consider the selective use of diagnostic laparoscopy instead. The study performed by Gallinas Victoriano F et al, "Ultrasonography for surgical pathology discrimination in acute abdominal pain" reviewed that abdominal ultrasonography has showed usefulness for surgical pathology discrimination in acute abdominal pain. When ultrasonography is inconclusive, clinical follow-up and periodical ultrasonography results in a positive change in management and treatment. The study performed by Testa A et al, "The role of emergency ultrasound in the diagnosis of acute non-traumatic epigastric pain." Reviewed that Clinical bedside ultrasonography (US) is actually the first-line imaging in acute epigastric pain patients presenting to the hospital Emergency Department (ED) because it is rapid, noninvasive, relatively inexpensive and focused, repeatable and reliable. Its systematic application by the emergency physician may reduce the wait for diagnosis and the over-usage of second-line radiological techniques, including computed tomography, as well as to increase the diagnostic accuracy with potential benefits for patient (safety), physician (efficacy) and the institution (efficiency). The study performed by Gans SL et al, "Plain abdominal radiography in acute abdominal pain; past, present, and future." reviewed that there is no place for plain abdominal radiography in the workup of adult patients with acute abdominal pain presenting in the emergency department in current practice.

Our study is showing that Ultrasonography is more useful in diagnosis as compared to Plain Radiography (X-Ray) and CT scan in the Emergency Medicine. However, CT has not been done in all the patients while USG & X-ray have been done for all patients. But in patients whom all three radiological studies have been done, USG shows a parallel result to CT findings. Hence USG is a useful, noninvasive, easily available, and cheaper tool to diagnose abdominal pain causing conditions in the Emergency room.

Conclusion: In our study, we found that majority of patients presenting to EMD with Abdominal Pain were male and belong to age group of 21-50 years.
Patients with generalised abdominal pain and Left Upper Quadrant pain were found to be having Nonspecific Abdominal Pain. Patients diagnosed as Acute Pancreatitis had come with pain in periumbilical area, Epigastric region, & pain in the back; while patients with Right Upper Quadrant pain turned out to be Acute Cholecystitis, Right Lower Quadrant pain turned out to be Acute Appendicitis, Flank pain patients had Ureteric Colic.

Patients with generalised abdominal nausea, vomiting and fever were found to be having Acute Appendicitis. Patients diagnosed as Bowel Obstruction had come with Abdominal Distension and Constipation; with anorexia, were diagnosed Nonspecific Abdominal Pain; with jaundice, were diagnosed Liver Abscess; with burning micturition, all were diagnosed Nonspecific Abdominal Pain.
In cases with tenderness and guarding, acute appendicitis diagnosed the most, while in cases with rigidity, acute pancreatitis diagnosed the most.

Though majority of patients were diagnosed with ultrasound examination of abdomen, most of patients had the final diagnosis of Nonspecific

Abdominal Pain mainly, presented with dull aching pain, predominating in Female.

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References:

1. Powers RD; Guertler AT. Abdominal pain in the ED: stability and change over 20 years. Am J Emerg Med 1995; 13(3):301-3 (ISSN: 0735-6757). 1995.
2. Irvin TT. Abdominal pain: a surgical audit of 1990 emergency admissions. Br J Surg. 1989 Nov;76(11):1121-5
3. Caterino S CM, Meli C, Murante G, Schiffino L, Lotito S, Toncher F. Acute abdominal pain in emergency surgery. Clinical epidemiologic study of 450 patients. Ann Ital Chir 1997 Nov-Dec;68(6):807-17:discussion 817-8. 1997.
4. Eskelinen M, Ikonen J, Lipponen P. Usefulness of history-taking, physical examination and diagnostic scoring in acute renal colic. Eur Urol. 1998 Dec;34(6):467-73
5. Lee SL, Walsh AJ, Ho HS. Computed tomography and ultrasonography do not improve and may delay the diagnosis and treatment of acute appendicitis. Arch Surg. 2001 May;136(5):556-62
6. Gallinas-Victoriano F; Garde-Lecumberri C; Perez-Martiz A; Bento-Bravo L; Martinez-Bermejo MA; Conde-Cortes J; Gonzalez-Alfageme A; Esparza-Estaun J. Ultrasonography for surgical pathology discrimination in acute abdominal pain. Prospective study. Cir Pediatr 2004; 17(3):141-4 (ISSN:0214-1221). 2004.
7. Morino M, Pellegrino L, Castagna E, Farinella E, Mao P. Acute nonspecific abdominal pain: A randomized, controlled trial comparing early laproscopy versus clinical observation. Ann Surg. 2006 Dec;244(6):881-6; discussion 6-8.
8. Cartwright SL, Knudson MP. Evaluation of acute abdominal pain in adults. Am Fam Physician. 2008 Apr 1;77(7):971-8.
9. Navarro Fernandez JA, Tarraga Lopez PJ, Rodriguez Montes JA, Lopez Cara MA. Validity of tests performed to diagnose acute abdominal pain in patients admitted at an emergency department. Rev Esp Enferm Dig. 2009 Sep;101(9):610-8.
10. Gans SL, Stoker J, Boermeester MA. Plain abdominal radiography in acute abdominal pain; past, present, and future. Int J Gen Med. 2012;5:525-33.

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