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Clinical Profile of Acute Abdomen cases in a Civil Hospital in coastal region of Karnataka

Dr. Anand.H
(Associate Professor department of General Surgery –Karwar Institute Of Medical Sciences)

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ABSTRACT

BACKGROUND: Most common reason for patient seeking medical attention in a surgical opd or emergency room is acute abdominal pain, there areseveral diseases presenting with abdomen painwith various associated features and differing severity based on pathology and also duration. The objective of the study was to note the various pattern of abdominal pain symptom and severity in different diseases in adults and commonest associated features.

METHODS: 100 Consecutive patients admitted or treated in Emergency department/Casualty of Civil Hospital Karwar attached to medical college was studied for complaints of pain abdomen from january 2021 to March2021 (three months).All patients with history of pain abdomen of duration of> 2 hours and< 5 days were included. Patients aged< 18 years, pregnant women, abdominal pain due to blunt or penetrating trauma, hemorrhagic shock caused by gastrointestinal bleeding or ruptured aortic aneurysm was excluded from the study.severity of pain was measured by asking the patient to identify their pain severityon Wong baker pain scale ranging from grade 0 to 10. Non-Specific abdominal pain was considered as an abdominal pain in right iliac/ hypogastric area lasting> 6 hours and< 8 days, without fever, leukocytosis, or obvious peritoneal signs and uncertain diagnosis after physical examination and baseline investigations including abdominal sonography, provided they have totally settled or underwent diagnostic laparoscopy that proved to be normal.

RESULTS: most of our patients were male, 38% of thepatients were in the 18-30 age group,and most common site of location of pain was in the lumbar region 31%,,commonest condition suffered was due to renal/ureteric pathology 31%,and appendicitis 14%, 43% of the patients confirmed suffering from grade 6 pain severity on the pain scale.

CONCLUSION: Abdominal pain is a common condition in out patient departmentand emergency room,developing good clinical skills and incorporating necessary and available investigations with a thorough knowledge of common presentations of various diseases aid in early and accurate diagnosis.

KEYWORDS: Abdominal pain, renal colic, appendicitis, non-specific abdominal pain.

I. BACKGROUND

Acute abdominal pain (AAP)isconsidered as any pain in abdomen arising out of a non-traumatic origin but duration of pain being no more than 5 days.[1]The most common complaints of patients coming to emergency departments is AAP.[2] Causes of AAP varies from a mild and self-limiting condition to a serious life threatening condition.[3]

Conditions causingAAPcan be classified as (1) Urgent- conditions which require treatment within 24 hours to prevent further complications or deterioration and (2) Non-Urgent- where immediate intervention is not needed.[3]

In a few set of patients cause for pain cannot be established these are grouped as Non-specific abdominal pain(NSAP).[4] Nearly 13 % to 40% surgical emergency admissions for acute abdomen isdue to NSAP.[5]

NSAP defined as pain which is present in the right iliac or hypogastric region and which has remained for more than 6 hours but less than 8 days. Patient being afebrile with normal leucocyte counts and showing no peritoneal signs. Diagnosis being uncertain even after physical examination and other routine basal investigation such as ultrasonography; provided they were later symptom free or they were taken up for diagnostic laparoscopy the result of which was normal.[6]

It is very important that attending emergency physician or surgeons have an thorough understanding of the various common diseases and its various presentations. Differential diagnosis of AAP can be various and includes appendicitis, inflammatory bowel disorder, cholecystitis, pancreatitis, peptic ulcer disease, ureteric or renal stones, referred pains to abdomen example due to pneumonia etc. All these may make it difficult to arrive at the diagnosis.[7,8,9]

Causes that need urgent management most frequently encountered by a surgeon includes inflammatory lesion of appendix and gallbladder (appendicitis,cholecystitis),diverticulitis,
obstruction of small and large bowel. Among non-urgent causes most common condition is non-specific abdominal pain (NSAP) or otherwise called as undifferentiated abdominal pain (UDAP)which is mostly diagnosis of exclusion.[10,11]

In female population its important to consider gynaecological disorders also like ectopic pregnancy, pelvic inflammatory diseases, and endometriosis.[12,13,14]

In modern days although surgeons are well equipped with additional diagnostic aids such as ultrasound, CT scan, laparoscopy the fact is even today misdiagnosis rate of common emergency such as acute appendicitis remains same. this only suggest clinician should concentrate and build up more clinical skill rather than depending more on diagnostic aids.[15]

Symptomssuch as anorexia, vomiting, diarrhoea etc. should be carefully assessed in all patients. Anorexia is commonly seen in patients with appendicitis in younger population (68%) howeverin older population it is just 20%-44%.[15] In surgical condition pain usually precedes vomiting except in oesophageal rupture due to forceful emesis.[16,17]

The key clinical decision is whether patient requires urgent surgery or can be managed conservatively.[17]

Factors that help in diagnosing high risk patients who may require surgery is

(1) pain which has been present since last 48 hours.
(2) pain followed by vomiting
(3) presence of guarding and rebound tenderness on palpation.
(4) elderly patients
(5) history of previous surgery

For patients whose pain is due to non- urgent causes admission can be avoided but should be re-evaluated the following day.

Patient usually complain of pain in back when it arises from retroperitoneal structures like kidneys and aorta.[18,19] Pain which is due to irritation of parietal peritoneum may be due to inflammation or due to chemical cause example infected peritoneal fluid, leaked gastric contents and blood, pain in such cases is more defined, sharp and localized in nature.[18,20] Kehr's sign is a classic example whereintraperitoneal blood irritates diaphragm causing shoulder pain.[21]

Abomen pain is an important component for diagnosing dengue. In adult patients suffering with dengue, there is high prevalence of abdominal pain, back ache, head ache and myalgia.[22,23,24]

Although restricted right sided diverticulitis is not so common in youngeradults its symptoms mimics that of acute appendicitis and since there is considerable rise in acute diverticulitis in many parts of world it's wise to consider acute diverticulitis as a differential diagnosis in patients with lower abdominal pain along with acute appendicitis and ovarian torsion.[25]

Santos and Kohl recommends mandatory examination of genitalia in all boys presenting with abdominal pain.[26]In a study conducted by Andersen and Williams (cases of torsion testes)134 out of 159 patients had abdominal pain which often preceded scrotal pain while 29 of 597 patients presented with only abdominal pain.[27] Testes can be rescued if operated within the time frame of six hours after onset of symptoms.

Ovarian torsion caused due to adnexal mass presents with acute lower abdominal pain followed by nausea and vomiting if findings on USG is equivocal MRI scan helps in diagnosing the torsion. However only way to confirm torsion is surgery either laparoscopy or laparotomy.[28]

Systemic lupus erythematosus (SLE) which is autoimmune connective tissue disease have few gastrointestinal manifestation also which may sometimes be life threatening. some of the patients who present as acute abdomen may be life threatening. Gastrointestinal manifestations of SLE which are of serious nature includes acute pancreatitis, pseuodo obstruction of intestines, perforation or haemorrhage with peritonitis as a result of mesenteric vasculitis.[29]

Visceral pain caused due to herpes zoster can be sometimes misdiagnosed as an acute abdomen and taken up for surgical exploration especially if pain abdomen appears before skin rashes.[30]

Diarrhoea is commonly seen in benign conditions but it can be due to more serious disorders like mesenteric ischemia and appendicitis.[18,19] Urge to defecate in elderly patients presenting with acute pain in abdomen can be due to a ruptured aneurysm. In the young it can suggest a ruptured ectopic pregnancy.[31]

As soon as surgeon sees the patient he should make a note on patient's general appearance, position of patient, pattern of respiration and facial expression.

Traditionally rebound testing is done by gently depressing the abdominal wall for 15-30 seconds and then relaxing it suddenly, but since it causes unnecessary pain Cope's early diagnoses of the acute abdomen suggest gentle percussion which

is more accurate and humane.[32] Other indirect tests are also available like the 'cough test' where examiner asks patient to cough and then looks for sign of pain such as, flinching, grimacing or moving their hands towards abdomen.[33]

In children same can be elicited by "Heel drop Jarring" test where child is asked to raise on toes and drop weight on heels. While examiner looks for signs of abdominal pain.[34,35]

In a prospective study Grey and colleagues observed that 79% of the 28 patients who closed the eyes during the abdominal examination had no identifiable organic pathology. Since it is normally presumed that patients normally keep a anxious watch on the examiner's hands to prevent any unnecessary pain. So this test is considered positive if patient closes his/her eyes during their abdominal examination.[36]

However several studies have shown only clinical evaluation is not sufficient for arriving at a specific diagnoses and to initiate the treatmenttargeting the exact pathology or cause.[3,37,38] Once history is taken and physical examination conducted, Lab investigation is ordered;physician or surgeonhas to decide upon which additional investigation is absolutely necessary based on his or her clinical evaluation.[1]

Conventional radiography do not add much value to clinical judgement.[3,39] Ultrasonography (USG) is usually the first line of investigation, inspite of CT scan having highest sensitivity and specificity in patientswith acute abdominal pain [3,39,40-42].However when ultrasound scan is negative or inconclusive one can order a CT scan (conditional CT strategy) [3]. In patients who are critically ill CT scan should be performed without a prior ultrasonography.[3]

Since no much literature on role of MRI in acute abdomen pain is available. MRI is used during pregnancy if there is any clinical suspicion of an urgent cause.[1]

For patients with acute pain in flank, x-ray KUB to look for stones in kidney ureter, bladder can be undertaken but however it has its limitations. Its sensitivity is only 45%-60%.sometimes presence of bowel gas, faecoliths or phleboliths[43](abdominal/pelvic calcification) makes it difficult to identify a ureteric stone, but once visualised a x-ray KUB is enough for assessment of shape,size and location of urinary calculi in some patients.

USG helps in identification of stone at PUJ, VUJ, renal pelvis/calyces but even with USG it is difficult to locate stones that are in between PUJand VUJ.[43]

CT scan is very useful in evaluating ureteric stones but risk of radiation hazard is higher with CT scan, it is ten times that of an abdominal X-ray and has a life time risk of malignancy of 1 in 4000.[43]

Cholecystitis is a clinical diagnosis and physician/ surgeons should concentrate more on history and physical examination rather than imaging studies.[44] In cholecystitis pain is mostly located in right upper quadrant or epigastrium, it may be radiating to back specifically to right shoulder blade. Frequently abdomen pain is associated with nausea and vomiting also when pain is worse on taking high-fat meal it is considered as a classic symptom of acute cholecystitis but this association is only present in 50% of cases.[44]

Although ultrasound is widely used as imaging modality for biliary disease it is accurate to detect presence or absence of stones but not for diagnosis of cholecystitis. As its sensititity and specificity is 80% and 88% respectively for acute calculus cholecystitis but only 36% and 17% respectively for acalculus cholecystitis.[44]

When doubt exist after USG in biliary disease cases cholescintigraphy (HIDA SCAN) is preferred it has sensitivity and specificityof 95% for acute calculus cholecystitis while 70% and 90% respectively for acalculouscholecystitis.[44]

Controversies exists about what to do for appendix which appear normal on diagnostic laparoscopy, some suggest not to remove appendix even if another diagnosis was not found during laparoscopy.[45,46] While few opine that even if appendix appear normal at laparoscopy it should be removedas it does not add to post operative morbidity or hospital stay.[47] Furthermore endoappendix may be missed on laproscopy and may require re-laparoscopy or laparotomy to remove the same. Hence few are in favour of appendicectomy even if it appears normal.

Treatment For patients with NSAP remain challenging and patients ultimately may be put for surgery, managed medically after admission, simply kept under observation to decide depending on fresh development or may be discharge with instructions and advise to follow-up the next day.[48] About 11% of patients above 50 years with initial diagnosis of NSAP were later found to have cancer mostly colonic.[49]

Aims

The aim of the study was to evaluate the clinicalprofile of patients presenting with acute abdomen of non-traumatic origin and co-relate withlab and/or radiological investigations.

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Objectives

The objective is to study the various pattern of Abdominal pain symptom of different disease condition among adults to improve clinical diagnostic accuracy.

Materials and methodology: 100 Consecutive patients admitted or treated in Emergency department/Casualty of Civil Hospital Karwar attached to medical college was studied for complaints of pain abdomen.

severity of pain was measured by asking the patient to identify their pain severityon Wong baker pain scale ranging from grade 0 to 10.

Non-Specific abdominal pain was considered as an abdominal pain in right iliac/ hypogastric area lasting> 6 hours and< 8 days, without fever, leukocytosis, or obvious peritoneal signs and uncertain diagnosis after physical examination and baseline investigations including abdominal sonography, provided they have totally settled or underwent diagnostic laparoscopy that proved to be normal.

II. METHODOLOGY

100 Consecutive patients admitted or treated in Emergency department/Casualty of Civil Hospital Karwar attached to medical college was studied for complaints of pain abdomen from january 2021 to March2021 (three months).All patients with history of pain abdomen of duration of> 2 hours and< 5 days were included. Patients aged< 18 years, pregnant women, abdominal pain due to blunt or penetrating trauma, hemorrhagic shock caused by gastrointestinal bleeding or ruptured aortic aneurysm was excluded from the study.severity of pain was measured by asking the patient to identify their pain severityon Wong baker pain scale ranging from grade 0 to 10. Non-Specific abdominal pain was considered as an abdominal pain in right iliac/ hypogastric area lasting> 6 hours and< 8 days, without fever, leukocytosis, or obvious peritoneal signs and uncertain diagnosis after physical examination and baseline investigations including abdominal sonography, provided they have totally settled or underwent diagnostic laparoscopy that proved to be normal. Study done with Institutional ethics committee approval (Protocol No. IEC/KRIMS/28/2019-20.)

Inclusion Criteria

All patients with history of pain abdomen of duration of> 2 hours and< 5 days were included.

Exclusion Criteria

Patients aged< 18 years, pregnant women, abdominal pain due to blunt or penetrating trauma, hemorrhagic shock caused by gastrointestinal bleeding or ruptured aortic aneurysm was excluded from the study.

Sex	No. of Cases	Percentage
Male	70	70%
Female	30	30%
Total	100	
Table 1. Sex Incidence		

Age Group (in years)	No. of Cases	Percentage
18-30	38	38%
31-40	24	24%
41-50	20	20%
51-60	09	09%
61-70	07	07%
71-80	02	02%
Table 2. Age Incidence		

Pain Type According to Patient	No. of Patients	Percentage(%)
colicky	40	40%
dull aching	30	30%
Burning	10	10 %
pricking	08	8%
vague pain	08	8%
Throbbing	04	4%
Table 3. Type of Pain as Described by Patients and their Frequency		

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Grades of Pain	No. of Patients Experiencing	Percentage
02	09	09%
04	21	21%
06	43	43%
08	18	18%
10	08	09%

Table 4. Proportion of Pain Severity as Identified by Patients on Pain Scale

Symptoms	No. of Patients	Percentage
Vomiting	42	42%
Burning micturition	12	12%
Fever	09	09%
Abdominal distension	09	09%

Table 5. Common Associated Symptoms with Pain Abdomen.

Disease (final Diagnosis)	Site of Pain	No. of Cases	Percentage (%)
Appendicitis	Right iliac fossa	14	14%
Renal/ureteric colic	Rt. lumbar Lt. lumbar	17 12	29%
Cholelcystitis	Right upper quadrant	01	01%
Subacute small bowel obstruction	generalised	02	02%
Pancreatitis	Upper half of abdomen generalised	04 02	06%
Pancreatic pseudocyst	generalised	01	01%
NSAP	Right iliac fossa hypogastrium	08 03	11%
Obstructed inguinal hernia	Lower half of abdomen	02	02%
Urinary tract infection	Hypogastrium	05	05%
Gastritis	Epigastrium	10	10%
Liver abscess	Generalised	01	01%
Choledocholithiasis	Upper half of abdomen	01	01%
Hepatocellular carcinoma	Right upper quadrant	01	01%
Colitis	Around umbilicus	04	04%
Obstructed umbilical hernia	Around umbilicus	01	01%
Polycystic kidney (right)	Rt. lumbar	01	01%
Renal cortical cyst	Rt. lumbar	01	01%
Impacted stools	generalised	01	01%
Ca stomach with liver secondaries	Upper half of abdomen	01	01%
Duodenal perforation	generalised	01	01%
Right adnexal mass	Right iliac fossa	01	01%
Appendicular mass	Right iliac fossa	01	01%
gastroenteritis	generalised	04	04%

Table 6. Comparison of Diseases with Respect to Site of Abdominal Pain at Presentation and Number of Different Cases with Percentage

III. RESULTS

Out of 100 patients more than half were male70(70%), female 30 (30%). Showingobvious male predominance.(table no.01). Most common age group who suffered from pain abdomen were between 18 to 30 years, a total of 38 patients (38%), followed by 31-40 yearswhich had 24 patients (24%), and 41 to 50 age group had a total of 20 patients (20%).i.e 82% of patients were between 18 to 50 years, further 09% patients were in age group 50-60, 07% between 61-70 and 02% between 71-80. table no. 2

Most common type of pain reported by patients were(1) vague pain08(8%) (2) dull aching 30 (30%),(3)colicky40 (40%),(4)pricking 8 (08%),(5)Burning 10 (10 %), Throbbing 4 (04%).(table no.3)

Wong-Baker Facespain rating scale WBF was used for grading the severity of pain.

Severity of pain – patientselected on pain scale shown below

According to the patient's self assessment of pain most patients suffered from grade 6 pain (43%), followed by in decreasing order of frequency grade 04 (21%), grade 8 (18%), grade 2 (9%),grade 10 (8%) (table no. 04).

In our study most frequent complaint associated with pain in patients who came to emergency/surgical opd was vomiting 42 %. this was followed by burning micturation 12 %, Fever 09% andabdominal distension 08 % (table no. 05). The pain was located in lumbar region in 31 patients (31%), in right iliac fossa in27 (27%), generalized pain was noted in 12 patients (12%), in epigastrium in ten patients(10%), in Hypogastrium in 08 patients (8%),pain located in upper half of abdomen in 06 patients (6%), around the umbilical region in 05 patients (5%),in right upper quadrant in 02 patient (2%),and lower half of abdomen in 02 patients (2%). Table no.06

Radiation of pain was noted in a total of 10 patients (10%).

IV. DISCUSSION

Abdomen pain is a common complaint that patient comes with to the emergency department and surgical opd. However not all cases have surgical cause for pain abdomen, some pain abdomen cases are due to medical illness.

Further while some cases have a non urgent cause of pain abdomen that can be treated on OPD-basis, some cases are due to urgent cause which needs immediate attention requiring admission and/or surgery.

Main challenge for attending surgeons or emergency physicians is to differentiate between medical and surgical cause and urgent from non-urgent causes. A thorough history and clinical examination, analysis of blood investigation reports, assisted sometimes by USG and/or CT scan helped to arrive at an final diagnosis. Few cases were listed to be pain due to non-specific cause (NSAP) which fitted in to criteria mentioned in methodology, these were 11 in number out of total 100. Amounting to 11%.However in other similar studies done by Saleh M Abbas et al[6]. it was 34%, while in study by Gion Franco Cervellin et al[9]. NSAP cases were 31.46%.

Acute appendicitis in our study was found among14subjects (14%), while in study by Cervellin etal[9] it was 3.80%. while in study done by Saleh M Abbas etal[6] number of patients diagnosed with appendicitis were 36 (12.58%). However in study by Lakshay chanana etal[50] appendicitis was noted in 10.6% of cases.

In our study pain due to renal/uretericcauses was highest 29 (29%). In study by lakshay chanana [50]ureteric colic was noted in 16.3%; in study by Cervellin etal[9] it was 31.18%. Pain due to bowel obstruction in study by Cervellini was 0.77%, in study by Nicole caporale etal[51] was 10%, while in Lakshay chanana etal [50]it was 5.3%, in our study it was02%Pain due to Hernias was 0.82%in study by Cervellin etal [9], in our study it was 03%.

Pain due to gastritis/peptic ulcer was 2.68% in study by Cervellin etal[9], in our study it was10%Pain due to liver disease was 1.3% in Nicole caporale etal[51] study, while in our study it was02%Pain due to gastroenteritis was 5.4% in study by Nicolo caporale etal [51] while in our study it was04 %Pain due to pancreatitis/pancreatic diseases was 1.89%, 11% and 2.5% in study by Cervellin etal[9], Lakshay chanana etal and Nicolo caporale etal[51] respectively.in our study pain due to pancreatic diseases stood at 07%.

V. CONCLUSION

Abdominal pain is a common condition in out patient department and emergency room,developing good clinical skills and incorporating necessary and available investigations with a thorough knowledge of common presentations of various diseases aid in early and accurate diagnosis.

REFERENCES

[1] Gans SL, Pols MA, Stoker J, Boermeester MA; expert steering group. Guideline for the diagnostic pathway in patients with acute abdominal pain. Dig Surg. 2015;32(1):23-31. doi: 10.1159/000371583. Epub 2015 Jan 28. PMID: 25659265.

[2] Kamin RA, Nowicki TA, Courtney DS, Powers RD: Pearls and pitfalls in the emergency department evaluation of abdominal pain. Emerg Med Clin North Am 2003;21:61–72, vi

[3] Lameris W, van Randen A, van Es HW, van Heesewijk JP, van Ramshorst B, Bouma WH, et al: Imaging strategies for detection of urgent conditions in patients with acute abdominal pain: diagnostic accuracy study. BMJ 2009;338:b2431

[4] Impact of Clinical Experience and Diagnostic Performance in Patients with Acute Abdominal Pain Helena Laurell,1 Lars-Erik Hansson,2 and Ulf Gunnarsson

[5] Morino M, Pellegrino L, Castagna E, Farinella E, Mao P. Acute nonspecific abdominal pain: A randomized, controlled

trial comparing early laparoscopy versus clinical observation. Ann Surg. 2006;244(6):881-888. doi:10.1097/01.sla.0000246886.80424.ad

[6] Abbas, S.M., Smithers, T. &Truter, E. What clinical and laboratory parameters determine significant intra abdominal pathology for patients assessed in hospital with acute abdominal pain?. World J EmergSurg 2, 26 (2007).https://doi.org/10.1186/1749-7922-2-26

[7] McNamara R, Dean AJ. Approach to acute abdominal pain. Emerg Med Clin North Am 2011;29:159-73, vii. 10.1016/j.emc.2011.01.013 [PubMed] [CrossRef] [Google Scholar]

[8] Palmer J, Pontius E. Abdominal Pain Mimics. Emerg Med Clin North Am 2016;34:409-23. 10.1016/j.emc.2015.12.007 [PubMed] [CrossRef] [Google Scholar]

[9] Cervellin G, Lippi G. Abdominal migraine in the differential diagnosis of acute abdominal pain. Am J Emerg Med 2015;33:864.e3-5. 10.1016/j.ajem.2014.12.066 [PubMed] [CrossRef] [Google Scholar]

[10] Powers RD, Guertler AT. Abdominal pain in the ED: stability and change over 20 years. Am J Emerg Med 1995;13:301-3. 10.1016/0735-6757(95)90204-X [PubMed] [CrossRef] [Google Scholar]

[11] Hastings RS, Powers RD. Abdominal pain in the ED: a 35 year retrospective. Am J Emerg Med 2011;29:711-6. 10.1016/j.ajem.2010.01.045 [PubMed] [CrossRef] [Google Scholar]

[12] Tayal VS, Bullard M, Swanson DR, et al. ED endovaginal pelvic ultrasound in nonpregnant women with right lower quadrant pain. Am J Emerg Med 2008;26:81-5. 10.1016/j.ajem.2007.02.029 [PubMed] [CrossRef] [Google Scholar]

[13] Cervellin G, Comelli I, Sartori E, et al. A four-year survey on unexpected pregnancy diagnoses in a large urban emergency department in Parma, Italy. Int J GynaecolObstet 2014;127:51-4. 10.1016/j.ijgo.2014.04.006 [PubMed] [CrossRef] [Google Scholar]

[14] Kaplan BC, Dart RG, Moskos M, et al. Ectopic pregnancy: prospective study with improved diagnostic accuracy. Ann Emerg Med 1996;28:10-7. 10.1016/S0196-0644(96)70131-2 [PubMed] [CrossRef] [Google Scholar]

[15] Macaluso CR, McNamara RM. Evaluation and management of acute abdominal pain in the emergency department. Int J Gen Med. 2012;5:789-797. doi:10.2147/IJGM.S25936

[16] Silen W. Cope's Early Diagnosis of the Acute Abdomen. New York: Oxford; 2010. Method of diagnosis: the history; pp. 18–27. [Google Scholar]

[17] Wagner JM, McKinney WP, Carpenter JL. Does this patient have appendicitis? JAMA. 1996;2786:1589–1594. [PubMed] [Google Scholar]

[18] Jung PJ, Merrell RC.Acute abdomen. GastroenterolClin North Am. 1988;17:227–244. [PubMed] [Google Scholar]

[19] Jones RS, Claridge JA. Acute abdomen. In: Townsend CM, Beauchamp RD, Evers BM, et al., editors. Sabiston Textbook of Surgery: the Biologic basis of Modern Surgical Practice. 17th ed. Philadelphia: Elsevier; 2004. pp. 1219–1238. [Google Scholar]

[20] Abbott J. Pelvic pain: lessons from anatomy and physiology. J Emerg Med. 1990;8:441–447. [PubMed] [Google Scholar]

[21] Hickey MS, Kiernan GJ, Weaver KE. Evaluation of abdominal pain. Emerg Med Clin North Am. 1989;7:437–452. [PubMed] [Google Scholar]

[22] Dinh The T, Le Thi Thu T, Nguyen Minh D, Tran Van N, Tran Tinh H, et al.. (2012) Clinical Features of Dengue in a Large Vietnamese Cohort: Intrinsically Lower Platelet Counts and Greater Risk for Bleeding in Adults than Children. PLoSNegl Trop Dis 6. Available: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3383761/. Accessed 12 March 2014.

[23] Khan MIH, Anwar E, Agha A, Hassanien NSM, Ullah E, et al. (2013) Factors predicting severe dengue in patients with dengue Fever. Mediterr J Hematol Infect Dis 5: e2013014

[24] Wichmann O, Hongsiriwon S, Bowonwatanuwong C, Chotivanich K, Sukthana Y, et al. (2004) Risk factors and clinical features associated with severe dengue infection in adults and children during the 2001 epidemic in Chonburi, Thailand. Trop Med Int Health 9: 1022–102

[25] Kamal MU, Baiomi A, Balar B. Acute Diverticulitis: A Rare Cause of Abdominal

Pain. Gastroenterology Res. 2019;12(4):203-207. doi:10.14740/gr1166

[26] Santos M, Kohl M. Testicular torsion masked by painful abdomen. DtschArzteblInt 2013;110:41.

[27] Anderson JB, Williamson RCN. Testicular torsion in Bristol: a 25-year review. Br J Surg 1988;75:988e92.

[28] Malaviya AN, Sharma A, Agarwal D, Kapoor S, Garg S, Singh S, Rawat R. Acute abdomen in SLE. Int J Rheum Dis. 2011 Feb;14(1):98-104. doi: 10.1111/j.1756-185X.2010.01581.x. Epub 2010 Nov 9. PMID: 21303489.

[29] OLMEZ, D., BOZ, A., ERKAN, N.. Varicella Zoster Infection: A Rare Cause of Abdominal Pain Mimicking Acute Abdomen. **Journal of Clinical Medicine Research**, North America, 0, oct. 2009.

[30] Silen W. Cope's Early Diagnosis of the Acute Abdomen. New York: Oxford; 2010. Method of diagnosis: the examination of the patient; pp. 28–40. [Google Scholar]

[31] Bundy DG, Byerley JS, Liles EA, et al. Does this child have appendicitis? JAMA. 2007;298:438–451. [PMC free article] [PubMed] [Google Scholar]

[32] MarkleGB. Heel-drop jarring test for appendicitis. Arch Surg. 1985;120:243. [PubMed] [Google Scholar]

[33] Gray DW, Dixon JM, Collin J. The closed eyes sign: an aid to diagnosing nonspecific abdominal pain. BMJ. 1988;297:837. [PMC free article] [PubMed] [Google Scholar]

[34] Laurell H, Hansson LE, Gunnarsson U: Diagnostic pitfalls and accuracy of diagnosis in acute abdominal pain. Scand J Gastroenterol 2006;41:1126–1131.

[35] Toorenvliet BR, Bakker RF, Flu HC, Merkus JW, Hamming JF, Breslau PJ: Standard outpatient re-evaluation for patients not admitted to the hospital after emergency department evaluation for acute abdominal pain. World J Surg 2010;34:480–486.

[36] MacKersie AB, Lane MJ, Gerhardt RT, Claypool HA, Keenan S, Katz DS, et al: Nontraumatic acute abdominal pain: unenhanced helical CT compared with three-view acute abdominal series. Radiology 2005;237:114–122.

[37] Tsushima Y, Yamada S, Aoki J, Motojima T, Endo K: Effect of contrast-enhanced computed tomography on diagnosis and management of acute abdomen in adults. ClinRadiol 2002;57:507–513.

[38] Foinant M, Lipiecka E, Buc E, Boire JY: Impact of computed tomography on patient's care in nontraumatic acute abdomen: 90 patients. J Radiol 2008;88:559–566.

[39] Udayasankar UK, Li J, et al: Acute abdominal pain: value of non-contrast enhanced ultralow-dose multi-detector row CT as a substitute for abdominal radiographs. EmergRadiol 2009;16:61–70

[40] Masarani M, Dinneen M. Ureteric colic: new trends in diagnosis and treatment. Postgrad Med J. 2007;83(981):469-472. doi:10.1136/pgmj.2006.055913

[41] Bridges F, Gibbs J, Melamed J, Cussatti E, White S. Clinically diagnosed cholecystitis: a case series. J Surg Case Rep. 2018 Feb 28;2018(2):rjy031. doi: 10.1093/jscr/rjy031. PMID: 29511527; PMCID: PMC5829721.

[42] Olsen JB, Myrén CJ, Haahr PE.Randomized study of the value of laparoscopy before appendicectomy. Br J Surg. 1993 Jul;80(7):922-3. doi: 10.1002/bjs.1800800744. PMID: 8369940.

[43] Thorell A, Gondal S, Schedvins K, Wallin G. Value of diagnostic laparoscopy in fertile women with suspected appendicitis Eur J Surg 1999;165:751-4.

[44] Greason KL, Rappold JF, Liberman MA. Incidental laparoscopic appendectomy for acute right lower quadrant abdominal pain. Its time has come. SurgEndosc. 1998 Mar;12(3):223-5. doi: 10.1007/s004649900639. PMID: 9502700.

[45] Cervellin, G., Mora, R., Ticinesi, A., Meschi, T., Comelli, I., Catena, F., & Lippi, G. (2016). Epidemiology and outcomes of acute abdominal pain in a large urban Emergency Department: retrospective analysis of 5,340 cases. Annals of translational medicine, 4(19), 362.https://doi.org/10.21037/atm.2016.09.10

[46] Prout WG. The significance of rebound tenderness in the acute abdomen. Br J Surg. 1970;57:508–510. [PubMed] [Google Scholar]

[47] Chanana, Lakshay & Amos Jegaraj, Moses & Kalyaniwala, Kimmin & Yadav, Bijesh & Paul Prabhakar Abhilash, Kundavaram. (2015). Clinical profile of non-traumatic acute abdominal pain presenting to an adult emergency department. Journal of family medicine and primary care. 4. 422-5. 10.4103/2249-4863.161344.

[48] Caporale N, Morselli-Labate AM, Nardi E, Cogliandro R, Cavazza M, Stanghellini V. Acute abdominal pain in the emergency department of a university hospital in Italy. United European Gastroenterology Journal. 2016;4(2):297-304. doi:10.1177/2050640615606012