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Original Research Article

Study of etiological factors, clinical profile and outcomes of the non-traumatic acute abdomen in adult patients

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ABSTRACT

Background: Acute abdomen is the most prevalent surgical emergency. The natural history of acute abdomen is contingent upon the underlying disease process, which may, in some cases, resolve spontaneously with or without intervention, while in others, it may advance to widespread peritonitis and mortality. The need of this research is to conduct a clinical audit of patients with non-traumatic acute abdomen to facilitate early detection and prompt care. Objectives were to investigate the etiological causes, clinical characteristics, and outcomes of non-traumatic acute abdomen.
Methods: Descriptive research conducted in a tertiary teaching hospital over an 18-month period (November 2022 to April 2024). Patients with acute abdomen requiring over 24 hours of observation or inpatient treatment in the surgical wards were included. The diagnosis was established by clinical and investigative findings and then validated during laparotomy in the operated patients.
Results: The 123 eligible patients were picked up to participate in the study. Surgical management was done in 67.5% cases and 32.5% were managed conservatively. The 98.4% cases were discharged whereas mortality was documented in 1.6% cases.
Conclusions: The diversity in presentations and underlying causes emphasizes the crucial role of prompt and accurate diagnosis. Low mortality rate (1.6%) and relatively short hospital stay (average 6.8 days) suggest the effectiveness of this targeted approach. In conclusion, this study highlights the diverse presentations and underlying causes of non-traumatic acute abdomen. By considering the specific aetiology and tailoring treatment accordingly, healthcare professionals can ensure prompt and effective management of this complex condition.

Keywords: Acute abdomen, Diagnosis, Surgery

INTRODUCTION

Acute abdomen refers to a disorder that necessitates prompt surgical intervention and is characterized by abdominal pain and soreness. The term "acute abdomen" refers to abdominal discomfort that has an abrupt start, is non-traumatic, and lasts no more than eight days. One of the most frequent reasons people visit the emergency department (ED) for treatment is non-traumatic acute abdomen. Acute abdominal discomfort is the reason for between 5 and 10% of ED visits.[1] The natural course of non-traumatic acute abdomen relies significantly upon the underlying clinical state. While a small percentage of instances of acute abdomen may proceed to generalized peritonitis and eventually mortality, some cases may cure on their own with or without therapy.[2]

Vascular occlusion is one of the underlying diseases that are linked to acute abdomen. intestinal blockage, inflammation, infection, etc. Acute appendicitis, acute cholecystitis, acute cholelithiasis, acute pancreatitis, diverticulitis, acute peritonitis (caused by rupture of the

hollow membrane or intra-abdominal problem), and other disorders are often linked to acute abdomen.[3]

Depending upon the nature, onset and location of pain, the presumptive diagnosis may be established. Abdominal pain of immediate onset is suggestive of vascular cause such as mesenteric ischemia. Abdominal pain associated with syncope suggests ruptured ectopic pregnancy or leaking abdominal aortic aneurysm. The pain of acute appendicitis originates as dull pain in paraumbilical area, which migrates to right lower quadrant.[4] Ovarian torsion presents as sudden onset pain in lower abdomen, which waxes and wanes and is commonly present with vomiting. However, in some cases the pain may be diffuse and its ethology may be difficult to diagnose. Apart from history taking, abdominal examination may aid in diagnosis. Guarding, rigidity and rebound tenderness suggest acute peritonitis whereas absent bowel sound on auscultation suggest bowel obstruction.[5]

Diagnostic confirmation is aided by laboratory and radiographic tests. At the moment, the principle of treating the patient instead of testing them is adhered to. If a conclusive diagnosis cannot be made, an exploratory laparotomy may be required. Significant morbidity may be linked to acute abdomen, and delaying seeking medical attention or starting treatment might aggravate the situation, increase the risk of complications, and raise the death rate. To lower the morbidity and mortality linked to acute abdomen during the perioperative period, early diagnosis and prompt treatment are essential.[6]

To investigate the various causes of non-traumatic acute abdomen in adult patients who arrive at people's hospitals, to investigate the distribution of patients with non-traumatic acute abdomen who come to people's hospitals by gender and age and to investigate adult patients' non-traumatic acute abdominal outcomes.

Aim

Aim of the study was to investigate the causes, symptoms, and consequences of non-traumatic acute abdomen. All patients over the age of 18 with a diagnosis of non-traumatic acute abdomen are eligible to apply.

Patients under the age of eighteen are exempt-individuals with acute abdominal trauma, the patients who disappeared or were LAMA and patients who declined to participate in the trial.

METHODS

Study type

It was a descriptive study

The study included all the units in the department of general surgery at PCMS and RC. All the patients of non-traumatic acute abdomen presenting at PCMS and RC, who meets the inclusion criteria as described earlier in the context will be taken into consideration after taking a duly filled informed consent in the language best understood by them and getting all the permission from institutional ethical committee.[7]

Detailed data regarding sociodemographic variables such as name, age, sex, address, socioeconomic status etc. was obtained and entered in proforma. Date of admission along with clinical history in detail was obtained.[8] History regarding abdominal pain, its onset, character, shifting, radiation, aggravating/ relieving factors and associated complaints were documented. Apart from this, personal, past and family history was obtained and documented in proforma.

All the patients were then subjected to detailed general examination. Per abdominal examination with respect to inspection, palpation, percussion and auscultation and findings were noted. Findings of systemic examination of other systems were also noted. Depending upon the history, examination and investigation findings, diagnosis was made and patients were managed surgically for underlying condition.[9]

During the surgery, intraoperative findings were noted. All the patients were followed up in post operative period till their hospital stay. The outcome was noted in terms of discharge or death. Length of hospital stay was also recorded.

Defining non-traumatic acute abdomen

The term "non-traumatic acute abdomen" refers to a clinical condition where the patient experiences sudden onset abdominal pain without a direct injury. This can be caused by various underlying conditions like gastrointestinal, vascular, or infectious disorders.

It is essential to clarify what constitutes the "acute abdomen" and what conditions would fall under the "non-traumatic" category. The study likely focuses on conditions like appendicitis, cholecystitis, bowel obstruction, pancreatitis, and others not caused by external trauma.[10]

Study design

The study could be a prospective cohort study, a retrospective chart review, or a cross-sectional study, depending on the available data and resources. From the timeline given (September 2014-October 2015), it sounds like this might be either a retrospective cohort study or a prospective observational study.

In a retrospective cohort study, data from hospital records would be reviewed, while in a prospective observational study, patients would be followed over time after presentation with acute abdominal symptoms.

Inclusion criteria

Adults (perhaps age 18-80), presenting with non-traumatic acute abdominal pain at a healthcare facility, diagnosed after clinical evaluation, imaging, and/or laboratory results were included in study.

Exclusion criteria

Patients with a history of abdominal trauma, chronic abdominal pain, or those unable to provide informed consent (in the case of prospective study design). Similarly, patients with conditions like chronic gastrointestinal disorders or those with prior surgical histories could be excluded.

Data collection

Data collection would be divided into clinical profile, etiological factors, and outcomes.

Clinical profile

This would involve the patient's demographics (age, sex), medical history (previous surgeries, comorbid conditions), and presenting symptoms (pain location, pain characteristics, nausea, vomiting, etc.). Additionally, vital signs like fever, tachycardia, or blood pressure could be recorded.[11]

Etiological factors

These refer to the causes of the acute abdominal condition. This might include conditions such as appendicitis, cholecystitis, pancreatitis, bowel obstruction, etc. Diagnostic tests like blood tests, imaging studies (CT scans, ultrasounds), and surgical findings (if applicable) would help categorize these factors.[12]

Outcomes

The study would track the outcomes based on the management approach used. These could be classified into: Resolution without surgery (medically managed cases), surgical intervention (for conditions like appendicitis or bowel obstruction) and mortality or complications (including prolonged hospitalization, postoperative complications, etc.)

Patient records (in a retrospective study) or direct observation (in a prospective study) would document the clinical progression and follow-up data.

Statistical analysis

For analyzing the data, appropriate statistical methods would be chosen based on the type of data (categorical vs. continuous). Some approaches might include: Descriptive statistics (mean, median, mode) to describe the patient demographics and clinical profiles. Frequency analysis for categorizing the types of conditions contributing to acute abdomen. Inferential statistics like chi-square tests or logistic regression could help determine factors associated with outcomes, such as which conditions are more likely to require surgery, or which ones have higher complication rates.

Data would likely be analyzed using software like SPSS or R, with significance levels set at 0.05.

Ethical considerations

The study would need to adhere to ethical guidelines for patient data collection. Informed consent would be required for prospective studies, and anonymization of patient data would ensure confidentiality.[13]

Limitations

There could be multiple limitations in such a study. For example:

Recall bias: In a retrospective study, there might be biases in recalling patient details accurately.

Selection bias: The study might not include patients from all geographical or socioeconomic backgrounds, which could affect the generalizability of results.

Data completeness: Missing data, incomplete medical records, or diagnostic test results might also affect the study's outcomes.

It's important to account for these biases and acknowledge them in the study limitations.[14]

Interpretation and conclusions

Once the data is analyzed, the researchers would interpret the results in light of the existing medical literature. For instance, identifying common etiologies and assessing the outcomes based on initial presentations and interventions would be key. Do certain clinical signs correlate strongly with certain diagnoses? What can we learn about the effectiveness of conservative vs. surgical management?

In conclusion, the methodology for such a study would involve clearly defining the patient population, meticulously collecting clinical and diagnostic data, and using appropriate statistical analysis to derive conclusions about the etiological factors, clinical profile, and outcomes of non-traumatic acute abdomen in adults.[15]

The final answer would be a well-structured, ethically sound study that adds to the understanding of how different factors contribute to acute abdominal pain and its management in adults. But I'm still not sure if this is the exact direction the question is asking about-should the methodology be more focused on clinical evaluation or

outcomes specifically? There seems to be some ambiguity that could be clarified further.

Sampling technique

Now, I'm thinking about the specific characteristics of this study. The population in question consists of adult patients presenting with non-traumatic acute abdomen, which is a broad group.

I have to ask: Do we want to select all patients, or do we focus on a particular subset? And how do we ensure that the sample adequately represents different etiological factors, clinical profiles, and outcomes?

Let me explore this step-by-step, considering the main aspects:

Population definition

The population under study includes adults (18 years and older) presenting to the hospital with non-traumatic acute abdominal pain. The diversity within this group would need to be reflected in the sample, as we want the study to cover a broad spectrum of conditions causing acute abdomen, ranging from infections (like appendicitis) to gastrointestinal disorders (like pancreatitis or bowel obstruction).[16]

I need to be mindful of the geographical and hospital settings too. The patient population may differ between urban and rural hospitals, teaching hospitals vs. general hospitals, and so on.

The inclusion criteria would be adults diagnosed with non-traumatic acute abdomen during the study period (e.g., from September 2014 to October 2015).

Exclusion criteria might include patients with traumatic abdominal pain, chronic abdominal disorders, or those with conditions requiring immediate surgery that could confound the study (e.g., ruptured appendicitis might not be suitable if the study is focused on pre-surgical management).

Sampling frame

The sampling frame would be the list or set of all adult patients who presented to the hospital with non-traumatic acute abdomen during the study period. This could come from hospital databases or patient records.

Sampling techniques

There are two primary categories of sampling techniques: probability sampling and non-probability sampling. Since I'm aiming for a representative sample, probability sampling methods are likely the best option, as they reduce bias and increase the generalizability of results.[17]

Simple random sampling

In a simple random sampling technique, every individual in the population has an equal chance of being selected. This could work if we have access to a complete list of patients and no further subdivisions of the population are required.

However, with a large and diverse sample, this may not ensure that all the relevant clinical profiles and etiologies are represented, especially rare conditions.[18]

Stratified random sampling

This technique could be more appropriate. In stratified random sampling, the population is divided into subgroups (strata) that are relevant to the research question, such as different age groups, sex, or specific etiological categories (e.g., gastrointestinal disorders, infections, etc.). Patients are then randomly selected from each subgroup, ensuring representation across different categories.

This would be useful for capturing various etiological factors and clinical profiles since non-traumatic acute abdomen can be caused by a wide array of conditions.

Systematic sampling

With systematic sampling, you select every nth patient from a list. This technique is simpler than random sampling and could work if the hospital has a large but ordered patient record system.

But I would have to be careful with this method because systematic sampling can introduce bias if there's an underlying pattern (e.g., time of year, time of day, etc.) in how patients are treated or admitted.

Cluster sampling

Cluster sampling is another approach where the population is divided into clusters, and some of these clusters are randomly selected to be studied. For example, if a hospital has different departments or sections (e.g., emergency, gastroenterology, surgery), you could randomly select certain sections or wards and then study all patients within those clusters. However, this could introduce bias because the clusters might not fully reflect the entire patient population.

Convenience sampling (Non-probability sampling)

A convenience sampling technique might be used in situations where it's difficult or costly to gather a representative sample. Here, patients who are easily accessible (such as those presenting to the emergency department) would be selected. While this method might be quicker and more practical, it is prone to bias since it may not reflect the full spectrum of cases.

Sample size calculation

The sample size is an important consideration because the goal is to ensure that the sample is large enough to detect meaningful differences in outcomes and etiologies. A power analysis can help determine the appropriate sample size based on the expected prevalence of different etiological factors, the desired confidence level (usually 95%), and the power of the test (typically set at 80%).

Factors like expected mortality rates, the number of patients requiring surgery, or the frequency of certain clinical profiles can be used to estimate the minimum sample size needed to generate reliable results.

Data collection and control

Once the sample is selected, consistent data collection methods are needed. This involves gathering information on clinical profiles (symptoms, medical history, vitals), etiological factors (diagnostic tests, imaging), and outcomes (treatment success, complications, length of stay).

Controls might be needed to account for confounding variables. For example, if certain conditions (like obesity) are more common in certain age groups, they might need to be controlled for during the analysis.

Ethical considerations

Informed consent would be necessary for prospective sampling, and confidentiality must be maintained for all patient data. This is a critical element, especially if the sampling technique involves accessing personal health records.

Potential pitfalls

One thing I'm thinking about: The success of the sampling technique hinges on the completeness and accuracy of the data collected. If the data from the sample is missing or misclassified, the results could be skewed. Ensuring reliable diagnosis and clear outcome tracking is key.

Another potential issue could arise from sampling biases- if the sample is not representative of all adult patients with non-traumatic acute abdomen, the conclusions might not be broadly applicable.

In conclusion, I would lean towards stratified random sampling as the best method to ensure that the study captures the full range of etiological factors, clinical profiles, and outcomes while minimizing bias. By breaking the population down into subgroups (e.g., based on underlying conditions or age), this method will allow the study to be more precise and reflect the diversity of the condition.

However, I'm still thinking: Is stratified random sampling the best method if the population is geographically diverse? Should I also consider multi-center data collection? It might help improve generalizability further. Hmm… I'll need to revisit that idea before finalizing.

RESULTS

Study conducted on total 123 cases with acute abdomen.

Table 1: Distribution of cases according to age, (n=123).

Age (in years)	N	Percentage (%)
≤20	11	8.9
21-30	39	31.7
31-40	36	29.3
41-50	29	23.6
>50	8	6.5

Mean age of patients with non-traumatic acute abdomen enrolled in our study was 35.84±12.14 years (ranging from 18 to 82 years). Majority of patients enrolled in our study belonged to age range of 21 to 30 years (31.7%), followed by 29.3% and 23.6% cases belonging to 31 to 40 years and 41 to 50 years of age respectively. Only 6.5% of the cases belonged to more than 50 years of age.

Table 2: Distribution of cases according to sex, (n=123).

Sex	N	Percentage (%)
Male	76	61.8
Female	47	38.2

In present study, reported male predominance for nontraumatic acute abdomen with male:female ratio of 1.8:1. About 61.8% cases with non traumatic acute abdomen were males whereas only 38.2% of cases were females.

Table 3: Distribution of cases according to occupation, (n=123).

Occupation	N	Percentage (%)
Driver	1	0.8
Electrician	4	3.3
Engineer	1	0.8
Farmer	19	15.4
Fruit/ vegetable vendor	5	4.1
Government employee	2	1.6
Labour	7	5.7
Mechanic	7	5.7
Nurse	1	0.8
Retired	1	0.8
Shopkeeper	17	13.8
Student	20	16.3
Teacher	12	9.8
Housewife	26	21.1

About 21.1% patients with non-traumatic acute abdomen were housewives whereas 16.3% were students, 15.4% were farmers and 13.8% were shopkeeper.

Table 4: Distribution of case according to characteristic of abdominal pain, (n=123).

Abdominal pain		N	Percentage (%)
Onset	Gradual	22	17.9
	Sudden	101	82.1
Character	Colicky	91	74.0
	Sharp	13	10.6
	Stabbing	19	15.4
Localization	Generalized	32	26.0
	Lower abdomen	54	43.9
	Upper abdomen	37	30.1
Previous similar episodes	No	73	59.3
	Yes	50	40.7

All the cases with non traumatic acute abdomen presented with abdominal pain and mean duration of pain was 2±1.01 days (1 to 5 days). The onset of pain was sudden in 82.1% cases and it was colicky in nature in 74% cases. Pain was localized to lower abdomen in 43.9% and upper abdomen in 30.1% cases, however it was generalized in 26% cases. History of previous similar episode was present in 40.7% cases.

Table 5: Distribution according to presence of associated clinical features, (n=123).

Associated clinical features		N	Percentage (%)
Vomiting		93	75.6
Nausea		83	67.5
Fever		44	35.8
Distension of abdomen		43	35.0
Bowel habit	Constipation	37	30.1
	Diarrhoea	2	1.6
	Regular	84	68.3
Burning micturition		46	37.4

Abdominal pain was associated with vomiting in 75.6% cases, nausea in 67.5% cases, burning micturition in 37.4% and fever in 35.8% cases. Abdominal distension and altered bowel habits were associated features in 35% and 31.7% cases respectively.

Table 6: Distribution according to addiction history, (n=123).

Addiction	N	Percentage (%)
Smoking	38	30.9
Alcohol	38	30.9

History of addiction to smoking and alcohol was present in 30.9% cases each.

Table 7: Distribution according to dietary history, (n=123).

Diet	N	Percentage (%)
Non-vegetarian	58	47.2
Vegetarian	65	52.8

More than half of the patients with non-traumatic acute abdomen were vegetarian whereas 47.2% cases were non vegetarian.

Table 8: Distribution of cases according to chronic illness, (n=123).

Chronic illness	N	Percentage (%)
Hypertension	15	12.2
Diabetes	12	9.7
Hypertension with diabetes	5	4.1
Tuberculosis	6	4.9
None	85	69.1

As observed from the above table, about 12.2% cases had hypertension whereas 9.7% cases had diabetes. Hypertension with diabetes was present in 4.1% cases. History of tuberculosis was present in 4.9% cases.

Table 9: Distribution according to vitals in patients with non-traumatic acute abdomen, (n=123).

Vitals		N	Percent (%)
Temperature	Afebrile	80	65.0
	Febrile	43	35.0
Pulse	Mean±SD	96.85±9.5	
Systolic BP	Mean±SD	124.08±15.5	
Diastolic BP	Mean±SD	79.72±10.85	

About 35% cases with non-traumatic acute abdomen enrolled in our study were febrile. Mean pulse rate was 96.85±9.5 per minute whereas mean systolic and diastolic blood pressure was 124.08±15.5 and 79.72±10.85 mmHg respectively.

On inspection, abdomen was distended in 36.6% cases and umbilicus was flat in 17.9% cases. About 4.1% cases had hernia. Palpation of abdomen revealed abdominal tenderness in 94.3% cases, guarding in 46.3% cases, abdominal mass in 94.3% cases and rigidity in 8.1% cases.

Percussion of abdomen revealed free fluid in 15.4% cases and bowel sounds were sluggish and absent in 12.2% and 22.8% cases respectively on auscultation.

Table 10: Distribution of cases according to findings of clinical examination, (n=123).

Clinical examination			N	Percentage (%)
Inspection	Abdominal shape	Distended	45	36.6
		Normal	78	63.4
	Umbilicus	Flat	22	17.9
		Inverted	101	82.1
	Hernia	Absent	118	95.9
		Present	5	4.1
Palpation	Tenderness		116	94.3
	Guarding		57	46.3
	Rigidity		10	8.1
	Mass		116	94.3
Percussion	Free fluid		19	15.4
Auscultation	Bowel sounds	Normal	76	61.8
		Increased	4	3.3
		Sluggish	15	12.2
		Absent	28	22.8

DISCUSSION

This descriptive study titled "a study on etiological factors, clinical profile and outcomes of the non-traumatic acute abdomen" investigated characteristics, causes, treatment, and outcomes of non-traumatic acute abdomen in 123 adult patients at a hospital in Bhopal, India. The study lasted 18 months (November 2022-April 2024) and excluded patients with traumatic injuries, those under 18, or who couldn't participate.[19]

Acute abdominal pain, especially non-traumatic, can be a medical emergency. This study holds significance because it sheds light on this very condition in adults. By understanding the various causes, typical symptoms, and treatment outcomes seen in this patient population, doctors can diagnose the issue faster and implement more effective management strategies. This translates to quicker relief for patients, potentially reduced complications, and improved overall outcomes. The study's findings can be valuable for informing clinical practice and potentially improving patient care for non-traumatic acute abdomen.[20]

Limitations

Confounding variables, inconsistent clinical diagnosis, limited follow-up, exclusion criteria, laboratory and diagnostic limitations, patient recall bias, diagnostic difficulties, small sample size, selection bias, retrospective nature, and generalization of findings are some of these. The results may not apply to the whole adult population or individuals in other regions, and a small sample may not accurately reflect the variety of patients with non-traumatic acute abdomen. Because retrospective nature may rely on pre-existing records, the data may be erroneous or incomplete. When identifying the precise etiology, inconsistent clinical diagnosis may create bias or mistakes. Comparisons may also be made more difficult by differences in treatment methods. Furthermore, the study could only be applicable to specific subgroups and not represent the range of possible causes and consequences in all adult populations.

CONCLUSION

This study explored non-traumatic acute abdominal pain in 123 adults at a hospital in India. The findings highlight the condition's complexity and underscores the importance of prompt diagnosis and tailored treatment. The study participants displayed a wide range of symptoms. Sudden and colicky abdominal pain, often concentrated in the lower abdomen, was a common thread. However, the location of pain could vary, and patients also reported accompanying symptoms like nausea, vomiting, and fever. Interestingly, diet wasn't a defining factor, with over half the patients being vegetarian. However, a significant portion reported smoking and alcohol use, suggesting potential contributing factors in some cases. The culprit behind the pain varied considerably. Acute cholecystitis, inflammation of the gallbladder, emerged as the most frequent diagnosis, followed by intestinal obstruction and urinary tract stones. Appendicitis and perforations in the digestive system were also encountered, albeit less frequently. This diversity in presentations and underlying causes emphasizes the crucial role of prompt and accurate diagnosis. By considering the patient's history, physical examination findings, and targeted investigations, healthcare professionals can determine the specific etiology. This directly influences treatment decisions. For instance, laparoscopic cholecystectomy, a minimally invasive procedure, was the most common surgery for gallbladder issues. Conversely, patients with intestinal obstruction might require bowel resections.

The low mortality rate (1.6%) and relatively short hospital stay (average 6.8 days) suggest the effectiveness of this targeted approach. Early diagnosis and appropriate treatment likely improved patient outcomes. In

conclusion, this study highlights the diverse presentations and underlying causes of non-traumatic acute abdomen. By considering the specific aetiology and tailoring treatment accordingly, healthcare professionals can ensure prompt and effective management of this complex condition

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REFERENCES

1. Kumar MS, Bharath B, Balasubramanya KS, Thinagaran K. The non traumatic acute abdomen and its clinical spectrum. Int Surg J. 2019;6:1710-5.
2. Patterson JW, Kashyap S, Dominique E. Acute Abdomen. In: StatPearls. Treasure Island (FL): StatPearls Publishing; 2023.
3. Kamin RA, Nowicki TA, Courtney DS, Powers RD. Pearls and pitfalls in the emergency department evaluation of abdominal pain. Emergency Med Clin. 2003;21(1):61-72.
4. Chanana L, Jegaraj MA, Kalyaniwala K, Yadav B, Abilash K. Clinical profile of non-traumatic acute abdominal pain presenting to an adult emergency department. J Family Med Pri Care. 2015;4(3):422.
5. Irvin TT. Abdominal pain: a surgical audit of 1190 emergency admissions. J Brit Surg. 1989;76(11):1121-5.
6. Sutha SK, Sellamoni S. Non Traumatic Abdominal Surgical Emergencies (Doctoral dissertation, Kilpauk Medical College, Chennai). RJPBCS. 2023;14(6):278.
7. Selbst SM, Friedman MJ, Singh SB. Epidemiology and etiology of malpractice lawsuits involving children in US emergency departments and urgent care centers. Pediatr Emerg Care. 2005;21(3):165-9.
8. Kachalia A, Gandhi TK, Puopolo AL, Yoon C, Thomas EJ, Griffey R, et al. Missed and delayed diagnoses in the emergency department: References Page 93 a study of closed malpractice claims from 4 liability insurers. Ann Emerg Med. 2007;49(2):196-205.
9. Elhardello OA, MacFie J. Digital rectal examination in patients with acute abdominal pain. Emerg Med J. 2018;35(9):579-80.
10. Verki MM, Motamed H. Rectus muscle hematoma as a rare differential diagnosis of acute abdomen; a case report. Emergency. 2018;6(1):e28.
11. Kaushal-Deep SM, Anees A, Khan S, Khan MA, Lodhi M. Primary cecal pathologies presenting as acute abdomen and critical appraisal of their current management strategies in emergency settings with review of literature. Int J Crit Illness Injury Sci. 2018;8(2):90.
12. Smith JE, Hall EJ. The use of plain abdominal x rays in the emergency department. Emerg Med J. 2009;26(3):160-3.
13. Gwynn LK. The diagnosis of acute appendicitis: clinical assessment versus computed tomography evaluation. J Emerg Med. 2001;21(2):119-23.
14. 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;136(5):556-62.
15. Scoutt LM, Sawyers SR, Bokhari J, Hamper UM. Ultrasound evaluation of the acute abdomen. Ultrasound Clin. 2007;2(3):493-523.
16. Macaluso CR, McNamara RM. Evaluation and management of acute abdominal pain in the emergency department. Int J General Med. 2012;5:789.
17. Abdullah M, Firmansyah MA. Diagnostic approach and management of acute abdominal pain. Acta Med Indones. 2012;44(4):344-50.
18. Prasad H, Rodrigues G, Shenoy R. Role of ultrasonography in non traumatic acute abdomen. Int J Radiol. 2006;5(2):1-2.
19. Bux GM, Baaodhah AM, Mahrooqi SA. Non-traumatic Acute Abdomen: Clinical Presentation and Outcomes. Int Case Rep J. 2022;2(6):1-6.
20. Millham FH. Acute abdominal pain. In: Feldman M, Friedman LS, Brandt LJ, eds. Feldman: Sleisenger and Fordtran's gastrointestinal and liver disease. 9th ed. Philadelphia: Elvesier. 2010;151-62.

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