Causes and Management of Acute Abdominal Pain in Geriatrics

Abstract:

Background: Aging affects all functions of the gastrointestinal system (GIS). The elderly commonly has atypical presentation of a disease with more subtle symptoms; hence physicians who are not familiar with these might miss the opportunity to make a diagnosis of abdominal pain in timely manner. the main objective of our study is to summarize the current evidence regarding causes and management of acute abdominal pain in elderlies.**Methodology:**MEDLINE, Embase, CINAHL, PsycInfo, and ASSIA were searched from 2000 until April 2021, and reference lists of included studies were searched. Studies were included that described causes and management of abdominal pain in elderlies.No software has been utilized to analyze the data. The data was extracted based on specific form that contains (Author's name, publication year, country, methodology and results).**Results:** The study included 7 papers. 2 cross sectional, 2 prospective and 3 retrospective studies all reporting causes and management of acute abdominal pain in elderlies. **Conclusion:** the most common causes of abdominal pain in elderly population were biliary disease, appendicitis and bowel obstruction. Renal colic, hernia and ischemia were also reported in different rates. Diagnosis and management of abdominal pain especially in elderly should be immediate to avoid potential complications.

Comment [S1]: Caps

Keywords: abdomen, pain, causes, management, acute, elderly, geriatrics

Introduction:

Aging affects all functions of the gastrointestinal system (GIS): motility, enzyme and hormone secretion, digestion, and absorption.While there is no GI disease that is specific and limited to advanced age, some illnesses are more prevalent in this age group and may require different management [1].

An acute abdomen is a condition that demands urgent attention and treatment. The acute abdomen may be caused by an infection, inflammation, vascular occlusion, or obstruction.Gastrointestinal (GI) changes in the elderly are common, and despite some GI disorders being more prevalent in the elderly, there is no GI disease that is limited to this age group [2]. While some changes associated with aging GI system are physiologic, others are pathological and particularly more prevalent among those above age 65 years. Abdominal pain in older adults is a concerning sy mptom common to a variety of diagnoses with high morbidity and mortality [3].

The causes of an acute abdomen in this population are similar to those found in younger patients with some differences in frequency. In each case, a sense of urgency to make the proper diagnosis and then institute appropriate therapy is critical [4].The elderly commonly has atypical presentation of a disease with more subtle symptoms; hence physicians who are not familiar with these might miss the opportunity to make a diagnosis in timely manner [5, 6]. Polypharmacy and medication side effects further contribute to the complexity of the clinical picture and can derail treating physicians in the wrong direction. Additionally, polypharmacy and comorbidities predispose elderly patients to a more complicated clinical course and increase the probability for development of complications [7].

Acute abdominal pain in the elderly patient presents a significant and challenging problem. In the elderly population, rapid recognition is particularly important, because the patient may have delayed seeking medical care and may have uncommon illnesses complicating the ultimate course [8].Diagnostic accuracy is lower, and mortality far higher, than in younger patients. Reasons for these differences are multifactorial: the case mix is different, the evolution and prognosis of specific diseases are different, and the ways in which diseases present are also different in elderly patients [9, 10].

Study Objective:

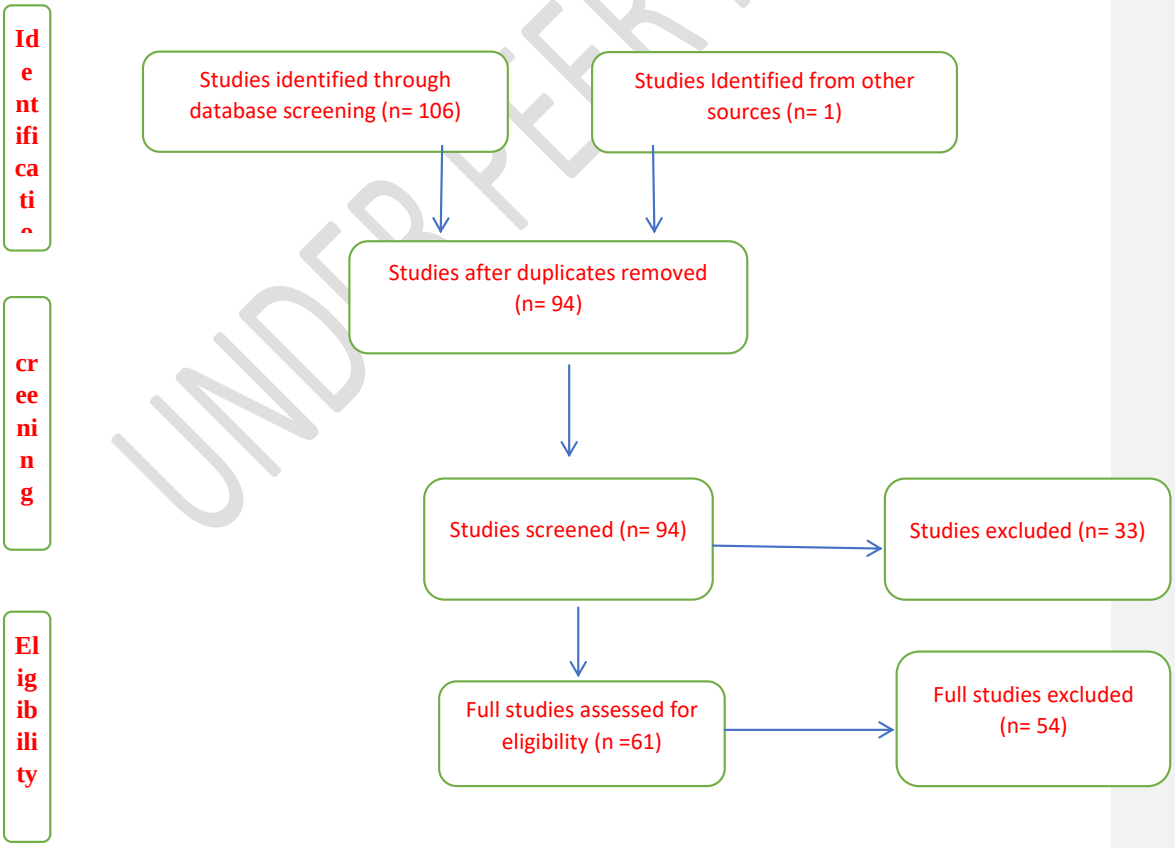
Therefore, the main objective of our study is to summarize the current evidence regarding causes and management of acute abdominal pain in elderlies.

Methodology:

Search strategy: Search strategies were combined for papers on abdominal pain causes, geriatric GI disorder, emergency management of abdominal pain in elderlies and most prevalent causes of abdominal pain in elderly together with qualitative methodological filters. MEDLINE, Embase, CINAHL, PsycInfo, and ASSIA were searched from 2000 until April 2021, and reference lists of included studies were searched. As showed in Figure (1).

Study selection: Studies were included that described causes and management of abdominal pain in elderlies. Papers were included that either focused on causes or management. Papers were excluded that examined other specific objectives. Paired reviewers independently screened titles and abstracts of all identified references. Pairedreviewers independently assessed full-text articles. Disagreements were resolved by discussion. Non-English studies were excluded.

Statistical Analysis: No software has been utilized to analyze the data. The data was extracted based on specific form that contains (Author's name, publication year, country, methodology and results). These data were reviewed by the group members to determine the initial findings, and the current evidence regarding causes and management of acute abdominal pain in elderlies. Double revision of each member's outcomes was applied to ensure the validity and minimize the mistakes.



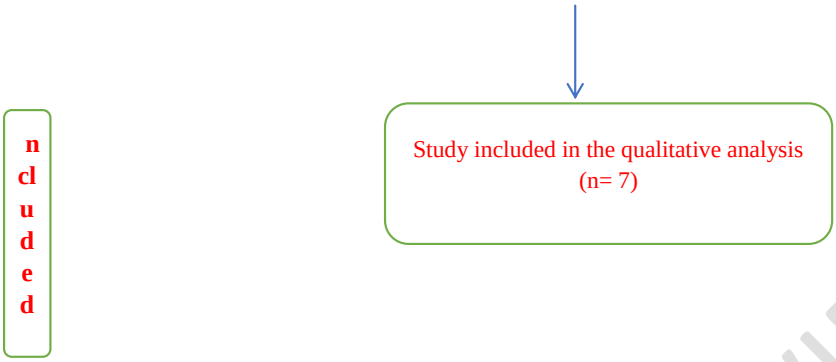


Figure (1): PRISMA chart showing data extraction process

Results:

The search of the mentioned databases returned a total of 107 studies that were included for title screening. 94 of them were included for abstract screening, which lead to the exclusion of 33 articles. The remaining 61 publications full-texts were reviewed. The full-text revision lead to the exclusion of 54 studies, and 7 were enrolled for final data extraction (Table 1).The included studies had different study designs.

Table (1) show studies conducted by HendenÇam, Pınar et al[11]; 48.2% were male, and 51.8% were female. An internal disease was detected in 76.8% of the patients as an origin of abdominal pain. 258 patients had a medical source (76.8%) and 78 had a surgical source (23.2%). Of the patients with medical diagnoses, 53.5% were in 65–74 years group and 46.5% were in 75 years and above group. Of the patients with surgical diagnoses, 48.7% were in 65–74 years group and 51.3% were in 75 years and above group.The most frequent finding accompanying abdominal pain was vomiting. The most frequent chronic disease accompanying abdominal pain was hypertension in both age groups.48.8% of the patients with abdominal pain were hospitalized and they were hospitalized mostly by gastroenterology ward (24.8%).**Laurell, H et al. found that [12];**Hospital stay increased from 170 days per 100 emergency admissions in the control group to 320 and 458 days in the younger and older study groups, respectively. At the emergency department, older patients were more often misdiagnosed than control patients (52 vs. 45%; $p = 0.002$). At discharge the diagnosis was more accurate in the control group (86 vs. 77%; $p < 0.0001$). Hospital mortality was higher among older patients (23/831 vs. 2/1,458; $p < 0.001$).

The admission-to-surgery interval was increased (1.8 vs. 0.9 days, $p < 0.0001$) in patients > or = 65 years. Rebound tenderness ($p < 0.0001$), local rigidity ($p = 0.003$) and rectal tenderness ($p = 0.004$) were less common in the older than in the control patients with peritonitis. In patients > or = 65 years, C-reactive protein did not differ between patients operated on and those not, contrary to the finding in patients < 65 years ($p < 0.0001$).

Table (2) show studies of Espinoza, Ricardo et al. who reported that [13]; 66% of elderly patients had concomitant diseases, that were multiple in 63%. Thirty one percent had postoperative complications. Compared with their younger counterparts, elderly patients required significantly ($p<0.05$) more admissions to intensive care units (2.7 and 24.2% respectively), more connections to mechanical ventilation (1.4 and 8.9% respectively) and longer hospital stays (5.4+/-7.4 and 12.4+/-10.9 days, respectively). In this series overall mortality was 6.7%, being 0.6% for young patients and 11.1% for the surgical group over 65 years old.**Osterwalder, Isabelle et al. found that [14];**thirty-day mortality was comparable to that of all other ED patients (2.2% vs. 2.1%). Patients with abdominal pain had a low risk of representation, and the majority of representations due to missed diagnoses were of benign origin. The high incidence of extra-abdominal causes is inoteworthy, as this may induce change to differential diagnosis of abdominal pain.

In table (3); Cervellin, Gianfranco et al. [15] reported that Renal colic was the most frequent cause of ED admission in men, whereas NSAP was more prevalent in women. Urinary tract infection was higher in women. Overall, 885 patients (16.57%) were hospitalized. Four hundred and eighty-five patients had repeated ED visits throughout the study period. Among these, 302 patients (6.46%) were readmitted within 30 days, whereas 187 patients (3.82%) were readmitted within 5 days. Renal colic was the first cause for ED readmission, followed by NSAP. In 13 cases readmitted to the ED within 5 days, and in 16 cases readmitted between 5–30 days the diagnosis was changed.**Gardner, Carly S et al. [16] reported that;**Utilization of abdominopelvic CT in geriatric patients presenting to the ED with acute abdominal symptoms strongly influences clinical management and significantly affects disposition. Diagnoses were clinically unsuspected prior to CT in 43% ($p < 0.05$), with significant difficultly in diagnosing SBO ($p < 0.05$), diverticulitis ($p < 0.01$), and colonic obstruction ($p < 0.01$). Positive CT results influenced treatment plans in 65%, surgical in 48%, and medical in 52%. Disposition from the ED was significantly affected by CT ($p < 0.001$), 65% of admissions with positive CT ($p < 0.001$) and 63% of discharges with negative CT ($p < 0.001$).**Costamagna, D et al. [17] reported that;** mean age of the patients was 78 years and the male/female ratio was 149/142. A total of 126 patients (43%) had one or more associated disease.Mesenteric ischaemia and secondary peritonitis were the most important causes of fatal outcome (respectively 42 and 17% of mortality).

Table 1:Cross sectional studies:

Comment [S2]: ED,NSAP-full forms to be mentioned..abbreviations should be mentioned

Author, year,	Country	Study type	Sample Size	Outcomes
HendenÇam, Pınar et al. **2018**	Turkey	Hospital-based cross-sectional study	336 patients	Most common prediagnoses were biliary diseases and diseases related to biliary tract followed by nonspecific abdominal pain, abdominal pain secondary to malignity, ileus, and acute gastroenteritis, respectively. The most frequent finding accompanying abdominal pain was vomiting. Surgical treatments were applied to the 17.6% of the patients with abdominal pain.
Laurell, H et al. **(2006)**	Sweden	Cross sectional	557 patients aged 65-79 years and 274 patients aged > or = 80 years were registered	A specific diagnosis, i.e. other than 'nonspecific abdominal pain', was established in 76 and 78% of the patients aged 65-79 and > or = 80 years respectively. Older patients were more often misdiagnosed than control patients.

Table (2): Prospective studies:

Author, year,	Country	Study type	Sample Size	Outcomes
Espinoza, Ricardo et al. **(2004)**	Spain	Prospective study	45 patients	The causes accounting for 71% of acute abdominal pain were bilio-pancreatic diseases (31.1%), intestinal adhesive obstruction (17.7%), complicated abdominal wall hernia (13.7%), and

				complications of peptic ulcer disease (8.9%). Sixty four percent required surgical treatment.
Osterwalder, Isabelle et al. **2020**	Switzerland	Prospective monocentric all-comer study	3960 screened presentations, 480 (12.1%) were due to Abdominal Pain	Among 63 (13.1%) related representations, the most prevalent causes were cholelithiasis, gastroenteritis, and urinary retention. A missed diagnosis was attributed to 27 (5.6%) presentations. Extra-abdominal causes were identified in 162 (43%) presentations.

Table (3): Retrospective Studies:

Author, year,	**Country**	**Study type**	**Sample Size**	**Outcomes**
Cervellin, Gianfranco et al. **(2016)**	Italy	Retrospective analysis	5,340 cases	The most frequent causes were nonspecific abdominal pain (NSAP) (31.46%), and renal colic (31.18%). Biliary colic/cholecystitis, and diverticulitis were more prevalent in patients aged >65 years (13.17% vs. 5.95%, and 7.28% vs. 2.47%, respectively). Appendicitis (i.e., 4.54% vs. 1.47%) and renal colic (34.48% vs. 20.84%) were more frequent in patients aged <65 years. NSAP was the most common cause in both age classes.

Gardner, Carly S et al. **(2015)**	USA	Retrospective study	464 patients	The most common diagnoses were SBO (18%), diverticulitis (9%), non-ischemic vascular-related emergency (6%), bowel ischemia (4%), appendicitis (3%), and colonic obstruction (2%).
Costamagna, D et al. **(2009)**	Italy	Retrospective study	291 consecutive patients	The most common causes for an emergency operation were mechanical bowel obstruction (45%), hollow viscus perforation (18%) and strangulated hernia (18%). 234 patients (80%) recovered and were free from major complications. The remaining 57 (20%) developed at least one major complication (including death). The 30-days postoperative deaths were 33 (11%).

Discussion:

As the life expectancy of the community increases,clinicians can expect an increase in geriatric patients presenting with abdominal pain.Compared with younger patients, this patient population is less likely to present with classic symptoms, physical examination findings, and laboratory values of abdominal disease [18].

Conditions causing acute abdominal pain may vary, from conditions needing immediate intervention, to relatively mild presentations needing careful observation to avoid over investigation and unnecessary interventions [19]. Common causes of an acute abdomen include acute appendicitis, cholecystitis, pancreatitis, and diverticulitis. Acute peritonitis is a cause of acute abdomen and can result from rupture of a hollow viscus or as a complication of inflammatory bowel disease or malignancy. Vascular events causing an acute abdomen include mesenteric ischemia and ruptured abdominal aortic aneurysm. Urologic conditions including

ureteral colic and pyelonephritis can also present as acute abdominal pain. Many authors include small bowel obstruction as a cause of acute abdomen [20].

As age progresses, contraction ability of the gallbladder, in response to cholecystokinin enzyme, decreases. Additionally, increased cholesterol and phospholipid content of the bile causes gallbladder stones and increased biliary tract diameter results in biliary diseases [21]. Among the studies included in our results; three studies reported biliary disorder as the first cause of abdominal pain in elderlies [11, 13, 15]. The mortality rate of elderly patients diagnosed with cholecystitis is approximately 10%. Cholecystitis is acalculous in approximately 10% of elderly patients with the condition. Classically, the diagnosis requires the presence of right upper quadrant pain associated with fever and leukocytosis [22].Appendicitis is a less common cause of abdominal pain in elderly patients than in younger patients, but the incidence among elderly patients appears to be rising. Only approximately 10% of cases of acute appendicitis occur in patients older than 60 years, whereas one half of all deaths from appendicitis occur in this age group [23]. Cervellin, Gianfranco et al. [15] reported that appendicitis is more common cause of abdominal pain in elderlies than other age groups.The initial diagnosis is incorrect in 40-50% of patients in this age range.Espinoza, Ricardo et al. [13] reported intestinal adhesive obstruction to be the cause of abdominal pain in (17.7%) of all studies cases. This was higher than a figure reported in previous study that bowel obstruction accounts for approximately 12% of cases of abdominal pain in elderly patients [24].

Diagnostic delay, late management and the risk of clinical worsening are the leading concerns of many EPs during the evaluation of patients with AAP. A comprehensive physical examination, close observation and serial diagnostic testing were found to be effective means to lower the risk of adverse outcome [25]. This conclusion is supported by the data of a systematic review and meta-analysis of the scientific literature, showing that the length of hospital stay and the rate of complications or readmission were not significantly different when comparing active observation with early laparoscopic intervention [26]. Additional evidence was brought that an observational period of 10 hours enhanced the ability to diagnosing appendicitis in patients with an intermediate probability [27]. In another prospective study including 220 patients of all ages admitted with AAP, a substantial decrease (i.e., from a 33% to a 5%) of negative findings on laparotomy was observed at the end of follow-up [28]. Interestingly, the data of our retrospective analysis confirms a large use of active clinical observation during ED stay, since 52% of our patients were discharged after more than 4 hours of LOS in the ED [29].

Conclusion:

After summarizing the current studies regarding causes and management of abdominal pain in geriatrics; the most common causes of abdominal pain in elderly population were biliary disease,

appendicitis and bowel obstruction. Renal colic, hernia and ischemia were also reported in different rates. Diagnosis and management of abdominal pain especially in elderly should be immediate to avoid potential complications.

The already known about this topic:

It is recurrently confusing, which changes in GI function represent a part of normal aging processes and which of them are pathological results of a disease process.

What this study adds:

- This study will summarize the current evidence regarding causes of acute abdominal pain in elderlies.
- This study will also explore the current evidence regarding management of acute abdominal pain in elderlies.

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