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Management of Non-Traumatic Acute Abdominal Pain in Elderly Patients

Dr. Fadhil Ghadhban Atshan
Consultant surgeon M.B.Ch.B C.A.B.S, Al-Ayen Iraqi University, College of health and medical technology

Prof. Dr. Ali Nayyef Assi
F.R.C.S, F.A.C.S, C.A.B.S Thi-Qar Unversity, medical college

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Annotation: OBJECTIVE. The aim of this study is to evaluate the effects of physiological changes in elderly patients in management of non-traumatic acute abdominal pain.

MATERIALS AND METHODS. After ethical approval, in the study, 50 patients were included and they were admitted in ED of Al-Hussein teaching hospital in Al-Nasiriya city South of Iraq. Patients age was range between 65 to 80s years, the chief complaint was abdominal pain and they present to hospital between April 2017 - August 2017. The patients were divided into two subgroups, group A (65–74 years) and B (> 75 years).

Inclusion criteria include non-traumatic abdominal pain patients older than 65 years.

Exclusion criteria: patients less than 65 years old and those with traumatic abdominal pain.

RESULTS. From 50 old age patients were admitted to the ED the total number and percentage of patient underwent surgery were 18 patients (36%)15 patients from group A (old age patients) (37.5%) while 3 elderly patients (30 %) from group B. The operations that were done in group A 2 patients for perforated peptic ulcer, 4 appendectomies, 4 cholecystectomies, 3 for surgical management of intestinal obstruction due

to tumor and 5 operations for management of obstructed hernia, while other patients were treated conservatively.

The percentage of non –malignant intestinal obstruction was 83.3% (18 patients).

CONCLUSION. Physiological changes related to aging process with comorbidities have adverse effects in clinical findings and making difficultly or delay in diagnosis of acute abdominal pain in elderly patient, so it is important to strictly adherence to guide lines in management of acute abdominal pain in geriatric patients.

Keywords: Old, elderly patients and acute abdomen.

Introduction

Definitions

The definition of “elderly” term is unclear. chronological age has been considered as 65 year or older, but the World Health Organization (WHO) suggested 75years or older depending on physical function improvement over the last two decades (2). There is a continuous discussion about how the term “elderly” should mean that biological age and chronological, independence level, and health status (3). In the available studies the age for the elderly ranges from 60 to 80 years (1,4,5,6,7,8,9).

What is the difference between Chronological and biological age?

An older person is defined by the United Nations as a person who is over 60 years of age. **Chronological ag**e is the time that has elapsed from birth date to a given date and it is the main way of defining age.

Biological age of a person occurs due to gradually accumulation of damages to various body cells and it represents physiological or functional age. Biological age differs from chronological one not only by the time elapsed, but also by a number of different developmental factors between biological and physiological age, such as lifestyle, nutrition, genetics, and comorbidities. (10)

What is a difference between old and elderly patient?

The chronological age of 65+ years as a definition of ‘elderly has been accepted by most developed countries according to the World Health Organization (WHO) reports. The United Nations (U.N.) agreed that 60+ years to refer to the older population since it reflects a more significant lifestyle changes like social isolation and retirement from work (11). Due to the improvement in health care services the number of older people is increasing worldwide. Old patient means patient with 65 - 74 years old, while Elderly patient: (>= 75 years).

There are many factors can affect the biological age more than chronological age, these things include Physical environment diet, exercise, sleep quality, stress levels, and smoking. (12)

How telomeres effect person's health and life expectancy?

At the end of chromosomes on DNA there are proteins called Telomeres which are responsible for protecting DNA’s function and structure.

poor health is associated with shorter telomeres. naturally telomeres shorten and degrade during an individual's life, telomeres degrading and shorting might speed by several factors like **genetics** which are **uncontrollable** (13); while **controllable factors** including poor diet (14) Obesity (14) Smoking (15) Less than adequate amounts of sleep (16) and Lack of exercise (12) can adversely affect telomere shortening,

What is the definition of acute abdomen?

It is a condition that required urgent management. acute abdominal conditions may be caused by an inflammation, infection, obstruction and vascular occlusion. Most patients have got sudden onset of abdominal pain, associated with nausea or vomiting and most them look ill.

How can we evaluate a patient present with an acute abdomen?

A thorough history and physical exam are the first steps in the approach to a patient with an acute abdominal pain and they are critical for pain localization. As example, diffuse abdominal pain may be a clinical sign in patients with free air in the abdomen due to perforated viscous, while rebound tenderness with guarding of abdominal muscles, and absences of bowel sounds may suggest peritonitis complicating intra-abdominal infection.

What are the common causes of an acute abdominal pain?

Briefly, causes include inflammation, perforation, rupture and obstruction.

They are specifically named in relation to an acute abdominal pain like acute appendicitis, perforated peptic ulcer, acute pancreatitis, perforated sigmoid diverticulum, torsion of the ovary, intestinal volvulus, dissection of aortic aneurysm, spleen or liver injury, Rectus muscle hematoma and ischemic bowel. (17) 18 (19)

Epidemiology

Abdominal pain patients admitted in the emergency department accounts for 7- 10%. The Centers for Disease Control and Prevention (CDC) reported that abdominal pain visitors to emergency room department at 2008 were accounted for 12.5% as an urgent patient, non-specific abdominal pain was accounted for one-third of the patients while 30% with acute renal colic. (20).

In 2019 according to the Administration for Community Living (ACL), the people older than 65 years accounted for 54.1 million, representing 16% of United States population (21) (22).

Why we are interested in the study of acute abdomen in elderly?

As the elderly people number increases, so the elderly patients number admitted to the ED increase. (23) (42).

What is the percentage of elderly patients with abdominal pain that presented to ED?

Elderly patient's characters can provide guidance for diagnosis and treatment of these group of patients. As we know that the number of elderly patients consulting the ED increases. (29) In some studies, the percentage of geriatric patients admitted to ED was between 9 and 19% and the patients are present with severe clinical situation in comparison with younger age patients (29-30-31-32)

While others reported that 20% of these patients with abdominal pain presenting to EDs are known to be elderly patients and 1/3 of these patients treated with surgical intervention.

A study was done by Fagbohun et al. shows that the most common reason of abdominal pain was related to biliary system diseases and primarily treated by surgery (33). The mortality rate for patients older than 65 years was reported by Mc Namara et al. which vary between 11 and 14%. and this due to comorbidities, multiple medications use, previous surgical procedures, impaired immune system, and delayed diagnosis of conditions, that required urgent surgical intervention in the ED. The diagnosis and treatment of geriatric patients in the ED units was a major a clinical challenge even for specialist physicians. (34)

Material and Method

After ethical approval for the study from AL- Hussain teaching hospital directors, 50 patients older than 65 years were included and they were admitted to ED with abdominal pain between April 2017 – December 2017 and investigated retrospectively. According to the age, the patients were divided into subgroups, in **group A,** Patients old between (65–74 years) while age of patients in **group B** was above (75 years). All patients were evaluated for chief complaint, vital signs, gender, age, and associated complaints with abdominal pain like (loss of appetite, nausea-vomiting, constipation, diarrhea, dysuria, urine color), comorbidities, duration of abdominal pain.

All patients were admitted firstly in the ED within 24 hours. The duration of hospital stays, type of treatment (medical, surgical), and outcomes were recorded.

Inclusion criteria include patients (65 years) with acute abdominal pain

Exclusion criteria: includes patients under 65 years and patients with traumatic abdominal pain.

Results

Of the 50 patients, 34 patients (68%) were male, and 16 patients (32%) were female. While 40 patients (80%) of (group A) patients, 10 patients (20%) of (group B) patients. Vomiting and constipation were the most frequent finding. The associated chronic disease were hypertension and diabetes mellitus. 17.6 % of hospitalized acute abdominal pain patients were treated surgically.

Table 1. Gender distribution

Sex	No.	%
Male	34	68.0
Female	16	32.0
Total	50	100
p. value 0.011		

Table 2. Age distribution

Age Groups	No.	%
60-70	30	60.0
70-74	10	20.0
75-85	10	20.0
Total	50	100
p. value <0.001		

What was the chief complaint of the patients?

Abdominal Pain was the most common presenting symptom in both groups, 27 patients in group A (67.5%) while 6 patients in group B (60%). **Vomiting** was presented in 3 patients (7.5%) in Group A and in 2 patients (20%) in group B.

Constipation was presented in 11 patients (27.5%) in Group A in comparison with Group B (3 patients (30%). Melena was presented in 2 patients (5%) in Group A versus (VS)Group B in which only (1 patient, 10%). Fever was presented in 3 patients (7.5%) in Group A in comparison with Group B (1 patient, 10 %).

While the presenting symptoms demonstrated in the following table:

3 Symptoms in both groups Table

Symptoms	Groups No. Patients	A%	Groups No. Patients	B%	Total
Nausea and Vomiting	26	65.0	3	20.0	58.0
Constipation	21	52.5	5	50.0	52.0
Pain	27	67.5	6	60.0	66.0
Malaena	2	5.0	1	10.0	6.0
Fever	33	66.0	3	30.0	72.0
p. value <0.001					

Medical history in both groups

In group A, history of diabetes was in 14 patients, (35%) while hypertension was in 25 patients (62. 5%). In group B history of diabetes was in 2 patients (2o%), while hypertension was in 7 patients (70% History of IHD was reported in Group A in 5 patients (12.5%) and in 2 patients (2o%) in Group B.

Table 4. medical history in both groups

Medical History	Groups No. Patients	A%	Groups No. Patients	B%	Total
Hypertension	25	62.5	7	70.0	64.0
DM	14	35.0	2	20.0	32.0
IHD	5	12.5	2	20.0	14.0
Previous laparotomy	2	5.0	0	0.0	4.0
p. value 0.013					

Pallor was presented in 4 patients of group A (10%) and 6 patients (60%) from Group B.

Dehydration was more common in group B (5 patients, 50%), while in Group A was (3 patients, 7.5 %).

jaundice was only in Group A (2 patients, 5%), no jaundice in Group B

Tenderness, guarding and rigidity were more noticed in Group A (21 patients,52.5 %; 19 patients 47.5% & 6 patients, 15% respectively) than in Group B (3 patients, 30%; 2 patients, 20% & 2 patients, 20% respectively).

Abdominal distention was more noticed in Group B (2 patients, 20 %) than in Group A (1 Patient 2.5 %).

Table -6: Signs presented in both groups

Signs	Groups		Groups		Total No. Patients	Total %
	No.	%	No.	%		
Pallor	4	10.0	6	60.0	10	20.0
Dehydration	3	7.5	5	50.0	8	16.0
Jaundice	1	2.5	0	0.0	1	0.5
Tenderness	21	52.5	3	30.0	24	48.0
Guarding	19	47.5	2	20.0	21	42.0
Rigidity	6	15.0	2	20.0	8	16.0
Abdominal distension	1	2.5	2	20.0	3	6.0
p. value <0.001						

Regarding vital signs in both groups, **bradycardia** was recorded in (2 patients, %) in Group A in comparison with Group B (1 patient). **Tachycardia** was recorded in (30 patients, %)of Group A and in (2 patients, %)in group B patients. **High respiratory rate** in Group A (1 patient, 4.8%) but no tachypnea in Group B (Zero).

Regarding change in body temperature, fever suggests an association of inflammatory process with acute abdomen in elderly patient, two patients in group B (20%) were feverish, while in group A (12) Patient (30%) were feverish. Hypertensive patient in group A were 17 patients (42.5%, while 6 patients 60% in group B, all other patients in both groups where normotensive no hypotensive patients were recorded. One patient was tachypnea in all patient in the group A and B.

Vital signs table 7

Vital Signs	Parameters	Groups A No. %	Groups B No. %	Total Patients No.	Total %
Pulse rate	Tachycardia	30	2	32	64.0
	Bradycardia	2	1	3	6.0
Temperature	Fever	33	3	36	72.0
Blood pressure	Hypertension	17	6	23	46.0
	Normotensive	23	4	27	54.0
	Hypotensive	0	0	0	0.0
Respiratory rate	Tachypnea	1	0	1	2.0
p. value 0.241					

Only 17% of elderly patients with perforated appendicitis presented with “classic” complaints.6) (39). The percent and number of patients regarding the causative pathology can be demonstrated

in the following details in (table -8).

Appendicitis was presented only in group A (**4** patients 10%).

Acute cholecystitis (**8** patients,20 % in Group A, **two** patients (20%) in Group B.

Intestinal obstruction was presented in **9** patients,14 % in Group A and **one** patient (10%) in Group B.

Perforated D.U was presented in **two** patients (4%) in Group A and **one** (10%) in Group B.

Acute pancreatitis was presented in **4** patients (10%) in Group A and **one** (10%) in Group B.

Urinary stone was presented only in Group A (**7** patients, 16%). UTI and urine retention were presented most commonly in Group B (**3** patients, 30%).(

Obstructed hernia: **5** patients 12.5% in group A, while in group B two patient were presented with obstructed inguinal hernia.

Renal stones, intestinal obstruction and acute cholecystitis were most commonly and significantly higher in old patients in group A respectively. While UTI, urine retention and acute cholecystitis were most commonly and significantly higher in elderly patients respectively. (Table -8)

Eighteen patients underwent surgical operation from group A (old age patients), (15 out of 40 old age patients 37.5%, while 3 out of 10 of elderly patients (30 %) underwent surgical operation. Total number and percentage of patient underwent surgery were 18 patients (36%).

Table 8. causative pathology

Causes	Group A		Group B		Total	
	No.	%	No.	%	No.	%
Intestinal obstruction	9	14.0	1	10.0	10	20.0
Acute cholecystitis	8	20.0	2	20.0	10	20.0
Renal stones	7	16.0	0	0.0	7	14.0
Urine retention BPHH	1	2.5	3	30.0	4	8.0
Acute appendicitis	4	10.0	0	0.0	4	8.0
Peptic ulcer perforation	2	4.0	1	10.0	3	6.0
Acute pancreatitis	4	10.0	1	10.0	5	10.0
Obstructed hernia	5	12.5	2	20.0	7	14
p. value <0.001						

The operations that were done in group A in **2** patients for perforated peptic ulcer, **4** appendectomies, **4** cholecystectomies, **3** for surgical management of intestinal obstruction due to tumor and **5** operations for management of obstructed hernia, while other patients were treated conservatively. The most common cause of intestinal obstructions was non-malignant pathology in 18 patients (83.3%).

Table- 9 Total number and percentage of patient underwent surgery

	Operative	Treatment	Conservative	Treatment	Total
	No.	%	No.	%	No.
Group A	15	37.5	25	62.2	40
Group B	3	30.0	7	70.0	10
p. value 0.232					

Postoperative complications were most common among diabetic patients. They were 4 patients (8%) with chest infection, 3 patients (6%) with UTI, one patient (2%) with DVT, 5 patients (10%) with wound infections and 1 patient (2%) with cardiac complications.

The complications were recorded for total patients included in the study because the age of the patient has no significant because the patient in group A and B were above 60+ in their ages.

Table-10) Total postoperative complications in both groups (

Complication	Gr. A/ Patient	Gr. B/ Patient	Total	
	No.	No.	No.	%
Chest infection	3	1	4	8.0
DVT	0	1	1	2.0
Cardiac Complication	1	0	1	2.0
Wound Infection	4	1	5	10.0
UTI	3	2	5	10.0
p. value 0.525				

Discussion

Acute abdominal pain is one of the most common causes of admissions to casualty unit were from acute abdominal pain patients. The difference of outcomes was related to a deficit of specific information about age and medical information regarding elderly patients. (27)

A range number for admission of elderly patient with acute abdominal pain in the ED in AL Hussain teaching hospital was 24 and 26 patients respectively out of 720 patients per two months in percent of 12.4%

The difficulties in diagnosis of acute abdominal pain in elderly patients First, related to difficulties in taking an accurate history in the elderly due to mostly deafness or cognitive disorders. Laboratory and imaging studies help to in diagnosis. A retrospective study by Parker et al. in 180 patients 65 years old, who were hospitalized for acute abdominal pain, they were found no significantly statistical difference in , WBC count, hemoglobin level, and liver function tests (ASAT, ALAT, Gamma-GT, alkaline phosphatase and bilirubin) between the groups that underwent urgent operation or within hospitalization, comparing to the group that did not need surgery but hospitalized for medical observation and follow up and also there was no difference in measurement of body temperature at admission time. (28)

During the local physician follow-up, a final diagnosis of non-specific abdominal pain (NSAP) is

confirmed in three out of four geriatric patients after discharge from the hospital (29). Lewis et al. in their study series of 209 patients (≥ 60 years of age) found that 30% of patients needed an emergency operation (30). In this study the total number and percentage of patients underwent surgery were 18 (36%) patients.

Regarding the etiology of the obstructions as reported in this study, the most common cause was benign disease 7 patient with intestinal obstruction due to obstructed abdominal wall hernia and 10 patient of mechanical bowel obstruction 6 were benign causes such as adhesion due to previous surgery while 4 patient had got bowel obstruction, one patient was female with carcinoid tumour at ileo-caecal junction, two male patients with sigmoid colon tumour and one patient with annular tumour at recto-sigmoidal junction so the total number of mechanical bowel obstruction was 17 patients and the percentage of benign was (76.4 %),which was approximated to the result of article published in the common cause of intestinal obstruction was benign disease in(79.1%) percent of patient and this was reported in Journal of Current Surgery,(ISSN 1927-1298 print, 1927-1301 online, Open Access).(31)(32)

The reported result in this study that the common emergency surgical problem was due to mechanical bowel obstruction (MBO) which was reported in (17 patients) out of 50 patient) admitted in ED, which constitute 34% of all admissions to the emergency surgical departments. Due to limited patients' study number, there is slight increase in the percentage of mechanical bowel obstruction (MBO) in comparison with other study which consists of 20% of all admissions were mechanical bowel obstruction (MBO) (33). MBO can be seen more frequently due to the obstructive tumors and torsions of the bowel in elderly.34

The incidence of tumoral AMBO overall is 3%. The reported incidence of colorectal cancer varies from 10% to 28%. (35,36)

In this study the incidence of bowel obstruction due to tumor (in 4 patient) was (8%) out of 50 patients, the total number of acute abdominal pain patients admitted in ED and also the result is approximated to comparison study.

Patients risk factors were affecting the incidence and distribution of bowel obstruction including to prior abdominal surgery, and pre-existing abdominal wall and an inguinal hernia. The incidence of small and large bowel obstructions is similar in both males and females. (37,38)

According to the previous information, so in this study the male/ female ratio is not calculated since the incidence of MBO is mostly related the predisposing factors rather than the type of gender.

Acute calculous cholecystitis: cholelithiasis effects more than 20 million Americans peoples annually. (39)

The prevalence ranges of gallstones about 20 to 30% in patients aged

≥ 60 years so it is increase with age. (40,41) and in an institutionalized individuals aged ≥ 90 years, it increased to 80% (42) so the prevalence of gallstone is growing up, if they expected that the United States population aged ≥ 65 years will be 43.1 million in 2012 and it is projected to be 82.7 million in 2050. (43)

Early laparoscopic cholecystectomy yields good results in elderly patients as reported in some studies. (44).

untreated acute cholecystitis has a risk of potentially severe complications. cholecystectomy is the treatment of choice for symptomatic gall stone and this is supported by Tokyo guidelines. (45)

By comparing frequency of clinical symptom of acute cholecystitis, in young-old (65-74 yr), middle-old (75-84 yr), and old-old (> or = 85 yr) population group and laboratory tests, and diagnostic imaging, these studies found frequency of abnormal clinical symptom in elderly (> or = 65 yr) patients (46).

In free article, up to 6% of elderly patients will experience severe an episode of acute cholecystitis. (47)

The gallstones prevalence at 90 years of age was 24% and 35% for males and females respectively and it may be increases to 80% in institutionalized people aged 90 years so the age is a strong risk factor in both sexes. (41)

In our study the incidence of acute cholecystitis (AC) was 20%, it presented AC in 10 out of 50 patients were admitted to the ED of AL-Husain teaching hospital and this result is more reliable since the prevalence of gall stone is correlated to age group depending in the result of the Italian Study on Cholelithiasis (MICOL) study. (41)

Four patients underwent laparoscopic cholecystectomy in patients aged less than 74 years, while the other 6 patients ((2 cases of them were elderly patients (> 74 years old) respond to conservative management and surgery postponed for scheduled laparoscopic cholecystectomy operations. Laparoscopic cholecystectomy can be safely performed in patients of up to 85 years. (48,49).

Acute appendicitis has a lifetime risk of 7–8% (50). the incidence of acute appendicitis has been stable over the last 20 years but recently there has been an increase in incidence in Asia, and the Middle East and South America. (51). Acute appendicitis is the second most common acute surgical pathological condition so its incidence in the elderly is not uncommon, while (15%) of 50 years old patients present in the emergency department have acute appendicitis with an increasing frequency of 7%. (52) (53) younger age persons develop appendicitis with 5-10%. In the elderly population the incidence of the appendicitis seems to be rising due to increase in the life expectancy. (54)

Regarding the results in our study the incidence of acute appendicitis among acute abdominal pain patients in the ED at AL-Husain teaching Hospital was 8% (4 out of 50 patients included in this study), and all those patients were undergoing appendectomy operations. This result is supported by the information reported in above study in which the incidence of acute appendicitis was 5-10% of cases and there is no difference in incidence as compared to the above study (54).

Because elderly patients with acute appendicitis have a sluggish physiological reaction, atypical presentation will delay in seeking medical help and management and increase incidence of Appendiceal Perforation and this may result in a higher rate of morbidity and mortality. (55,56).

The early use of CT scan in the evaluation of elderly patients with acute abdomen can cut short the way to the appropriate treatment. (57)

Conclusion

The diagnosis of acute abdominal pain is more difficult in elderly patients because of atypical presentation, and age-related physiological changes, all these should be considered by physicians working in the ED. Supply the ED with sophisticated diagnostic equipment like CT scan and well-trained medical personal who have a good experience in management of acute abdomen in elderly patients may help to decrease rate of misdiagnosis and morbidity and mortality in elderly patients.

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