

# Causal Factors and Delayed Referral of Patients of Acute Secondary Peritonitis at Herat Regional Hospital-2018-2019; a Retrospective Study

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## Original Research

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# Abstract

**Background:** acute secondary peritonitis is an inflammation of the peritoneum. Surgeons in this field face this deadly pathology, and in Afghanistan, where health services have not yet been systematically standardized, the establishment of this pathology is more likely to be challenging. The aim of this study was to address the most causal factors as well as causes of delayed referral of acute secondary peritonitis at the only tertiary referral hospital in west region of Afghanistan, Herat Regional Hospital.

**Results:** 496 patients were operated with diagnosis of acute secondary peritonitis. 58% of patients were male and the highest age group were being from 10-19 years old (32.25%). 75.21% of these patients had a delay of more than 24 hours from the onset of the first complaint to laparotomy with the highest number (23.18%) delays for 3 days, even 2 patients had symptoms for 31 to 60 days (0.40%). The most common symptoms were abdominal pain with 97%, followed by nausea and vomiting 81% and anorexia 74%. Among all pathologies, acute appendicitis was the most common cause of peritonitis (64.5%) followed by small bowel perforation (9.7%) and peptic ulcer perforation (8.5%). According to late referral 79% started medical treatment after consulting a general doctor, 15% didn't come to health facilities due to long distances and 6% started home treatment due to wrong believes.

**Conclusion:** According to our research, there is still some acute abdomen patients who come late to health facilities and this is because of the limited resources, cultural issues and lack of the knowledge of the general doctors. In order to decrease the number of these patients we need to expand knowledge of both patients and health staffs, in another word consulting abdominal pain patients should be obligatory by surgeons.

## Introduction:

Acute secondary peritonitis is one of the most dangerous pathologies that challenges surgeons. The treatment of peritonitis was done in 1926 by the German surgeon M. Kirshner [1], And since then, in the treatment of this deadly disease, an urgent and fundamental place has been allocated for urgent and timely surgery [2, 3].

Although doctors have made significant progress in the management of patients with acute peritonitis in recent decades, the mortality rate of these patients are still reported to be between 19 and 70% [1, 4, 5]. The cause of 90% of deaths in these patients were the delay in the transfer and emergency surgery in the hospital [5, 6]. Researches show that the main causes of acute secondary peritonitis are perforation of hollow organs caused by acute inflammatory diseases, trauma, intestinal obstruction, malignant and benign tumors [7, 8, 9].

Complications like surgical infection, abdominal abscess, fecal fistulas, and thoracic complications are the causes of mortality and morbidity among them [10].

## Method:

This retrospective study was performed by studying the recorded archive of peritonitis surgery patients' files in Herat Regional Hospital. The study period was from 2018 to 2019 and all the medical records were studied and written in a questionnaire. 496 laparotomies were done due to acute secondary peritonitis. According to the questionnaire, the required information was obtained from the file of these patients, first a group of 5 doctors were trained who to take the necessary information and then they were sent to collect the data. Included criteria was the patients who was operated by laparotomy due to acute secondary peritonitis and excluded criteria was the patients whom had local peritonitis, acute abdomen without peritonitis, peritonitis due to trauma and acute peritonitis who died without laparotomy. Demographic parameters, etiology, signs and symptoms, delay in admission, lab investigations, condition on discharge were the mainly criteria. The data were analyzed by SPSS 24.

## Results:

From 2018 to 2019, a total number of 17,745 patients were admitted to the Herat Regional Hospital. Of these, 8585 were men and 9160 were women. It is noteworthy that the surgery department of Herat Regional Hospital has covered emergency pediatric and adolescent surgery, trauma surgery, routine surgery, urological surgery and gynecological surgery from Herat and neighboring provinces.

Of the 17,745 patients who underwent surgery, 496 were diagnosed with acute secondary peritonitis after laparotomy, representing 2.8% of the total surgical patients between 2018 and 2019 (based on operational findings). Figure 1: The percentage of peritonitis patients in Herat Regional Hospital, 2018 – 2019.

Among 496 patients with acute secondary peritonitis, 290 were men (58%) and 206 (42%) were women. Among these patients, different age groups were observed, with the highest age group being from 10–19 years old (32.25%), followed by 20–29 years old (23.99%) and lowest age group 70–80 years old (2.62%). Figure 2: Distribution of General peritonitis by age.

Another important feature that plays a significant role in the formation of peritonitis is the length of time that the patient has spent from the first symptoms out of hospital to the time of laparotomy in the operating room. Of the 496 patients with general peritonitis, 75.21% had a delay of more than 24 hours from the onset of the first complaint to laparotomy. The highest number of patients with 23.18% had delays for 3 days and even some patients has symptoms for 4 to 8 weeks (1.81%).

Table 1  
The delayed time

The onset of symptoms	Number of patients	Percent
Less than 6 hours	22	4.43%
6 to 12 hours	23	4.63%
1 day	78	15.73%
2 days	89	17.94%
3 days	115	23.18%
4 days	59	11.89%
5 days	39	7.86%
6 days	14	2.82%
7 days	23	4.63%
8 to 10 days	15	3.02%
11 to 20 days	10	2.06%
21 to 30 days	7	1.41%
31 to 60 days	2	0.40%
Total	496	100.00%

The reason for the late arrival of patients to the hospital was the following:

- (79%) - went to see a general doctor and started medical treatment
- (15%) came late due to distance from the city and health centers
- (6%) started treatment at home (with the advice of non-professionals)

Analysis of the data shows that between 74–100% of patients initially complained of abdominal pain, nausea and vomiting and anorexia, with abdominal pain occurring in approximately 97% of patients.

Table 2  
complaints

<b>Signs and symptoms of peritonitis patients</b>	<b>Percent</b>
Abdominal pain	97%
Nausea and vomiting	81%
Anorexia	74%
Constipation	29%
Obstipation	22.50%
Abdominal distension	21.50%
Weakness and fatigue	19%
Fever	10.50%
Diarrhea	2.50%
Thirst	2%
Dyspnea	1.50%

The following table shows the conditions and pathologies that have caused peritonitis in the above patients: Among all pathologies, acute appendicitis is the most common cause of peritonitis (64.51%).

Table 3  
causes

<b>Casual factors of peritonitis</b>	<b>Number</b>	<b>Percent</b>
Acute Appendicitis	320	64.51%
Small bowl perforation	48	9.70%
Peptic Ulcer Perforation	42	8.50%
Unknown	24	4.85%
Hydatid cyst	9	1.81%
Ectopic pregnancy	8	1.61%
Mesenteric ischemia	5	1%
Colonic Perforation	16	3.22%
Uterus perforation	5	1%
Rupture of Ovarian cyst	4	0.80%
Rupture of spleen	4	0.80%
Cholecystitis	4	0.80%
Pancreatitis	3	0.60%
Urinary bladder perforation	2	0.40%
Foreign body	1	0.20%
liver tumor	1	0.20%
<b>Total</b>	<b>496</b>	<b>100.00%</b>

The hospital stay time in which patients spent in the surgery ward is shown in table below:

Table 4  
Bed occupancy

Number of days	Number of patients	Percentage
< 4	49	9.88%
4	98	19.76%
5	69	13.92%
6	69	13.92%
7	53	10.68%
8	42	8.46%
9	36	7.26%
10	39	7.86%
> 10	41	8.26%
Total	496	100.00%

As seen in table above 19.76% in the hospital for 4 days after surgery, 13.92% was for 5 to 6 days in the hospital and even 8.26% had more than 10 days in the hospital.

90.12% of the patients were recovered from the surgery, 34 patients had transferred to other centers (6.85%) for better treatment and 15 patients (3.03%) has died due to complications.

## Discussion:

This study outlines the percentage of acute secondary peritonitis patients, distribution of acute secondary peritonitis by age, sex, etiology, symptoms, outcomes of surgically managed, casual factors and reason of delayed referral of patients at Herat Regional Hospital at 2018–2019.

In our study, the maximum incidence of peritonitis was found to be between the age of 10–19 years accounting for 32.25%, followed by 20–29 years (23.99%), in 30–39 years (12.11%) and the least age was between 70–80 about 2.62%. In a study by Raj Kumar et al in India 23.53% patients were in age group 21–30 years, 13.73% patients in age-group of 31–40 years and 1.96% patients in age group of 71–80 years [11]. In another study by Varun Raju Thirumalagiri, 30% patients were between 20–29 years, 6% patients between 30–39, 14% patients between 40–50 years old [7]. In another study conducted by Raj Kumar et al in a tertiary care hospital 54.25% patients were in age group of 21–50 years old [12]. Our research is equal to Raj Kumar and Thirumalagiri researches in the 2nd, 3th and 7th decades of live. Our research showed that 56.24% of patients are in the 2nd and third decades of life which is the age of working, education and reproduction.

In our study among 496 patients 58% were male and 42% were female. In study of Raj Kumar et al 86.26% of the patients were male and 13.73% were female and male to female ratio was 6.26:1 [11]. In another study by M.R. Shanker et al 76% of patients were male and 24% females and a male to female ratio was 2.84:1 [13]. In another study by Shahida Parveen Afridi et al 68.3% of patients were male and 31.7% were female with the ration of 2.1:1 [14]. Our findings in the term of sex are different from researches by Afridi, Raj and Shanker. This difference is because Herat Regional Hospital is the only tertiary and referral hospital in West Region of Afghanistan which accepts all critical patients. On the other hand, as mentioned before Herat Regional Hospital is accepting all kinds of patients even gynecological patients.

2.8% of emergency operations in our hospital in the department of general surgery were for peritonitis. This finding is not comparable with many other studies. M. R. Shanker et al, in India in 2018 reported an incidence rate of 26% [13]. Arveen et al in a study from 2006–2008 at JIPMER reported an incidence rate of 25% [15]. This big difference might be because Herat Regional Hospital accepts all kinds of patients including routine and trauma, on the other hand we excluded trauma peritonitis from our research so this may have significant impact on the incidence.

In our study we observed that the most common etiology of acute secondary peritonitis was acute appendicitis (64.51%), small bowel perforation (9.7%), peptic ulcer perforation (8.50%), colonic perforation (3.22%). The researches by others are summarized at the following chart:

Table 5  
casual factors

Casual factors	Our research	Raj kumar et al <sup>12</sup>	Jonathan Sameul et al <sup>16</sup>	Atul Kumar Vyas et al <sup>17</sup>	Shanker et al <sup>18</sup>	Ohene-Yeboah M <sup>21</sup>
Acute appendicitis	64.51%	9.80%	22%	18%	44%	43.1%
Peptic ulcer perforation	8.50%	77.13%	11%	57%	36%	12%
Small bowel perforation	9.7%	7.84%	11%	13%	–	10.50%
Colonic perforation	3.22%	–	–	–	–	–

According to our findings the most cause of peritonitis is acute appendicitis (64.51%). Our results are consistent with western experience [20], Shanker (44%) and Ohene-Yeboah (43.1%) however some series from India have shown different results Vyas (18%) and Kumar (9.8%). This difference clarifies that the number of peritonitis due to acute appendicitis is still high in Afghanistan. In a study by varun Raju Thirumalagiri et al [7] and Rajender Singh Jhobta [19] colonic perforation stands 4%, while in our research

is 3.22%, which is approximately the same as others. As you see the table above in the field of small bowel perforation, our research is the same as others. Peptic ulcer perforation in our research is the same with the researches by Jonathan Sameul et al and Ohene-Yeboah et al but there is still big difference with Raj Kumar and Atul Kumar researches which might be that in Raj Kumar and Atul Kumar the number of studied patients are less, on the other hand perforation of peptic ulcer is one of the most cases of general peritonitis in India [27].

The mortality rate in our study was 3.03% while it was 8% in the study by Thirumalagiri VR [7], 10% in study by Jhobta [19] and 8.82% in study of SK. Dokle[22]. In fact, our research is almost the same as above researches in the incidence of mortality because we referred our critical patients (6.85%) to other centers and we don't know about their results.

Our research regarding the frequency of symptoms are with the following: 97% abdominal pain, 81% nausea and vomiting, 51% constipation and obstipation, 21.50% abdominal distention and 10.50% fever. Other researches regarding the symptoms are as follow:

Table 6  
symptoms

Frequency of symptoms	Our research	M.R. Shanker et al <sup>18</sup>	Raj Kumar et al <sup>12</sup>	Atul Kumar Vyas <sup>17</sup>	Sivaram et al <sup>23</sup>
Abdominal pain	97%	100%	100%	100%	100%
Nausea/vomiting	81%	–	–	64%	55%
Constipation	51%	48%	–	84%	–
Abdominal distention	21.5%	52%	86.27%	88%	44%
fever	10.5%	–	33.99%	34%	25%

As seen in above table, abdominal pain, constipation and vomiting are almost the same in our research with other researches. In our research abdominal distention and fever has big difference with researches by Raj Kumar and Atul Kumar. The difference might be due to a long gap between the beginning of symptoms and coming to hospital and we also have some uncommon peritonitis like peritonitis due to uterus, ovarian cyst, spleen, liver tumor and many more

In our research, there was a significant gap from onset of symptoms to the surgery time. From 496 patients 75.21% had a delay of more than 24 hours from the onset of the first complaint to laparotomy. The highest number of patients with 23.18% had delays for 3 days and even some patients has symptoms for 4 to 8 weeks (1.81%). A research by Atul Kumar Vyas et al [17] showed that 64% of patients presented at variable times beyond 24 hours from onset of symptoms. Kotiso *et al.* noted 25% mortality rate in patients with symptoms over 2 days in compare to 7.6% less than 2 days [24]. In a

research by Ranju Singh et al among 84 patients 100% who died had symptoms more than 3 days [26]. Timing of presentation over 24 hours was found to be a significant factor in developing of post-operative mortality and morbidity [25].

## **Conclusion:**

Acute secondary peritonitis is still high in west region of Afghanistan specially among illiterate, low socioeconomic class, low culture class and rural settings. The most common causes of secondary peritonitis in our society is acute appendicitis while in other countries appendicitis-peritonitis is not common. Most of our patients came late to Herat Regional Hospital so we have noticed that delayed referral of patients are due to many reasons like un-education, lack of health facilities, wrong beliefs, lack of skilled health workers, traditional treatments, damaged health systems, lack of transportation and road facility. Treatment outcome would be better by early diagnosis, better health facilities and better skilled health care workers. We have noticed that many patients with acute abdominal pain still do not benefit from timely consultation with a specialist surgeon. At the first line of examination, acute abdominal patients are still mediated by GP doctors or medical personnel. The conditions of the country and the culture of the society also had an effect on the patients with acute abdominal pain. We have found that signs and symptoms are still significant and helpful for diagnosis of acute secondary peritonitis specially in limited resources areas like Afghanistan where diagnostic tools are less and costly. Most of our patients are in the second and third decades of life, the time of working, education, reproduction and many more. In order to have a better outcome, all patients with abdominal pains must be consulted with surgeons and all the people and health personnel should be aware of consequences of delay in diagnosis of abdominal pain patients.

## **Declarations:**

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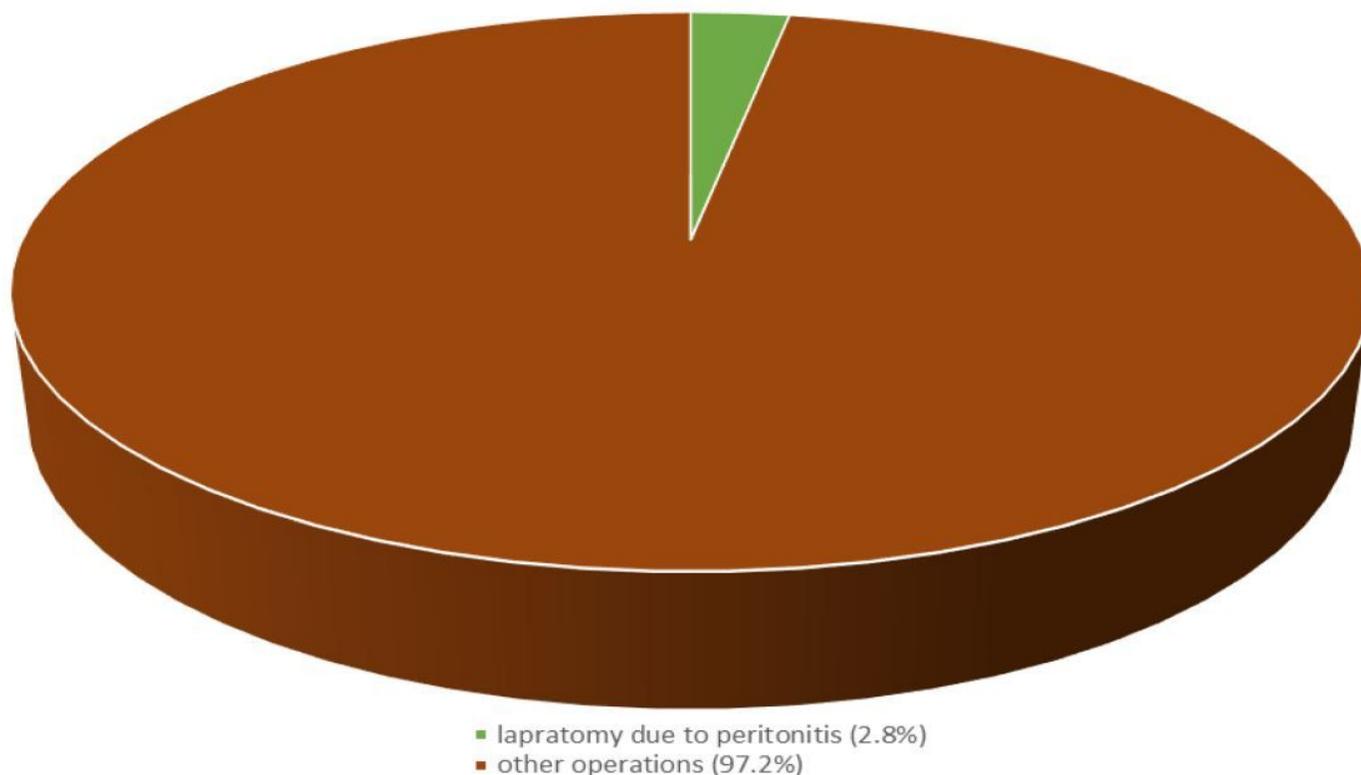
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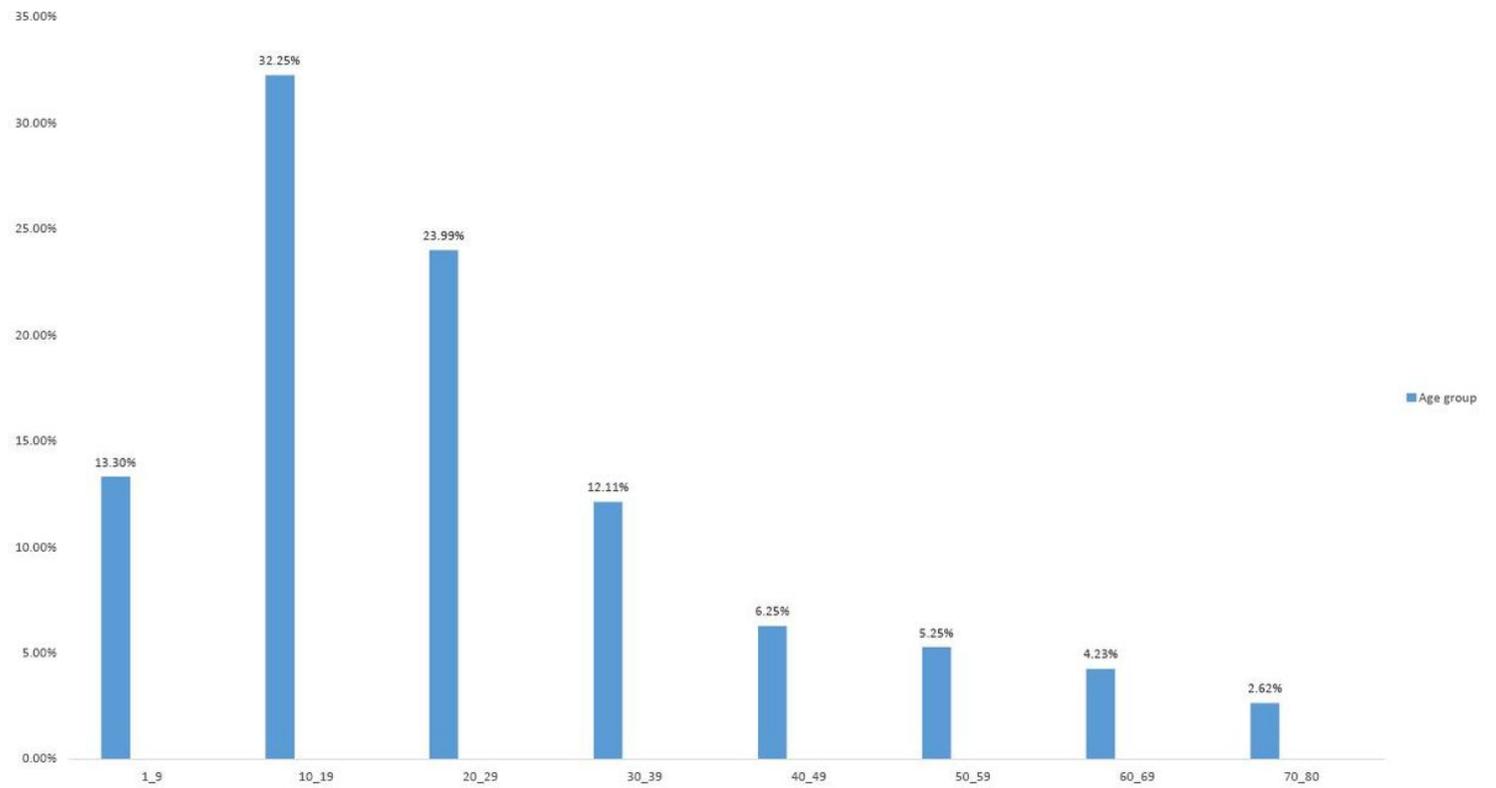
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## Figures



**Figure 1**

The percentage of peritonitis patients in Herat Regional Hospital, 2018-201.



**Figure 2**

Distribution of General peritonitis by age.