

STUDY INTRA-ABDOMINAL HYPERTENSION IN PATIENTS WITH SEVERE ACUTE PANCREATITIS AT NGHE AN FRIENDSHIP GENERAL HOPITAL

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ABSTRACT

Background: Increased intra-abdominal pressure is common in patients with acute pancreatitis, and increased intra-abdominal pressure occurs due to inflammatory processes in the pancreas, peritoneal fluid, paralytic ileus, and fluid resuscitation. Increased intra-abdominal pressure increases morbidity and mortality in patients with acute pancreatitis.

Objectives: To evaluate the degree of increased intra-abdominal pressure in patients with acute pancreatitis and treatment prognosis according to the degree of increased intra-abdominal pressure.

Subjects and methods: A case-series study of 31 patients diagnosed with acute pancreatitis according to Atlanta 2012 criteria at the Intensive Care Unit of Friendship Hospital in Nghe An from January 2020 to September 2020.

Results: The mean age was 55.1 ± 20.5 years old, in which male: 77.4%. The rate of increased intra-abdominal pressure was 61.3%. Classification according to the Balthazar classification of mild acute pancreatitis has 64.51% and 35.48% severe. According to Atlanta criteria, mild acute pancreatitis has 45.16 % and severe is 54.8%. Rate of increased intra-abdominal pressure grade I: 19.4, grade II: 22.5%; grade III: 12.9%, grade IV: 6.5%. Increased intra-abdominal pressure has a severe prognostic value according to the RANSON, IMRIE and APACHE II scales with an area under the curve of 0.86, respectively; 0.85 and 0.95. Failure of 1 organ, increased intra-abdominal pressure grade I, II. Failure of 3 organs, increased intra-abdominal pressure grade III, IV.

Conclusion: The rate of increased intra-abdominal pressure was 61.3%. Increased intra-abdominal pressure has a classification value, predicts severity and is related to the number of organ failure in patients with acute pancreatitis.

Keywords: Acute pancreatitis, increased intra-abdominal pressure.

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1. INTRODUCTION

Increased intra-abdominal pressure occurs in 60 – 80% of patients with severe acute pancreatitis depending on the study population [1]. Increased abdominal pressure occurs due to the inflammatory process in the pancreas, increasing complications and death in patients with acute pancreatitis, therefore monitoring abdominal pressure and draining abdominal fluid to reduce abdominal pressure is one of the treatment goals in patients with severe acute pancreatitis. In Vietnam, there are currently few studies on increased abdominal pressure in patients with severe acute pancreatitis and in Nghe An there are no studies on increased abdominal pressure in patients with acute pancreatitis. The aim of this study is to assess the level of increased abdominal pressure in patients with acute pancreatitis and predicting treatment according to the level of increased.

2. METHODS

2.1. Research subjects

Patient selection criteria:

Patients with severe acute pancreatitis ≥ 18 years old, treated at the Intensive Care Department - Nghe An General Friendship Hospital from January 2020 to September 2020, had abdominal pressure measured and monitored.

Exclusion criteria:

Patients with chronic diseases such as heart failure grade III and IV; end-stage cancer; Systemic lupus erythematosus; chronic renal failure; Cirrhosis.

2.2. Research Methods

2.2.1. Research design: The case-series study was applied.

2.2.2. Standards used in research:

Diagnosis of acute pancreatitis and severity of acute pancreatitis according to Atlanta 2012 criteria. [2] Diagnosis of abdominal pressure and degree of increased abdominal pressure according to the standards of the World Association for Abdominal Compression Syndrome abdomen in 2013: increased abdominal pressure when abdominal pressure ≥ 12 mmHg is prolonged or repeated.

Regarding the degree of increased abdominal pressure: grade I: 12-15 mmHg (16-20 cm H₂O), grade II: 16-20 mmHg (21-27 cm H₂O), grade III: 21-25 mmHg (28-34 cm H₂O), grade IV: 25 mmHg (>34 cm H₂O); Abdominal compression syndrome occurs when abdominal pressure >20 mmHg is accompanied by new organ dysfunction. [3]

2.2.3. Instruments and methods for measuring abdominal pressure

Measure abdominal pressure according to the recommendations of the World Association for Abdominal Compression Syndrome in 2013: measure abdominal pressure through the bladder, using a closed, sterile system, connected to a urinary catheter and drainage bag urine retention. The measurement steps are as follows: zero level is the midaxillary line at the anterior superior iliac spine, the patient lies supine, head flat, drains all urine from the bladder, injects 25 ml of sterile saline into the bladder, pressure bladder equal to abdominal pressure, choose the lowest water column height, corresponding to the exhalation, unit cmH₂O converted to mmHg.

2.3. Data processing: Using SPSS 20.0 software.



3. RESULT

Table 1. Classification of patients by age and sex

Gender Age	Male		Female		Total	
	n	%	n	%	N	%
<20	0	0,0	0	0,0	0	0,0
20 – 39	11	35,8	2	28,4	13	41,93
40 – 59	11	45,7	4	57,4	15	48,39
≥ 60	2	8,5	1	14,2	3	9,68
$\bar{X} \pm SD$	$55,1 \pm 20,5$					

The average age is 55.1 ± 20.5 years old, most common from 30 to 49 years old, male/female ratio: 3.4/1

Table 2. Classification of Severe acute pancreatitis according to Atlanta standards

Classification	N	%
Mild acute pancreatitis	14	45,16
Severe acute pancreatitis	17	54,84
Total	31	100

Severe acute pancreatitis accounts for 54.48%; mild accounts for 45.16%

Table 3. Rate of increased abdominal pressure at admission

Classification	N	(%)
No increase in abdominal pressure	12	38,7
Grade I (16-20 cm H ₂ O)	6	19,4
Grade II (21-27 cm H ₂ O)	7	22,5
Grade III (28-34 cm H ₂ O)	4	12,9
Grade IV (>34 cm H ₂ O)	2	6,5

The rate of increased abdominal pressure is 61.3%, of which grade I is 19.4%; grade II 22.5%; grade III 12.9%; Grade IV 6.5%.

Table 4. Relationship between acute pancreatitis assessment scores and abdominal pressure

Characteristics	Increased abdominal pressure	No increased abdominal pressure	p
RANSON	6,1 ± 2,81	3,52 ± 1,42	<0,05
IMRIE	4,5 ± 2,11	1,5 ± 0,41	<0,05
APACHE II	12,5 ± 4,51	5,6 ± 3,8	<0,05
CTSI (Balthazar)	8,5 ± 1,64	4,56 ± 1,76	<0,05

RANSON, IMRIE, APACHEII, CTSI scores in the group with increased abdominal pressure were higher than the group without increased abdominal pressure, p<0.05.

Table 5. Predictive value of acute pancreatitis severity of abdominal pressure according to the scale

Scale	Abdominal pressure threshold score (cm H ₂ O)	Sensitivity	Specificity	Predictive value (+)	Predictive value (-)
RANSON	22,7	95,31	80,12	79,09	93,56
IMRIE	21,3	87,52	85,15	75,71	89,15
APACHE II	23,8	98,55	87,76	86,67	90,12

RANSON scale: Abdominal pressure on the first day with a cut-off point of 22.7 cm H₂O has the ability to early predict severe acute pancreatitis with a sensitivity of 95.31%; Specificity 80.12%, positive diagnostic value 79.09%; negative diagnosis 93.56%. IMRIE scale: abdominal pressure on the first day with Cut-off score of 21.3 cmH₂O has the ability to early predict severe acute pancreatitis with a sensitivity of 87.52%;

Specificity 85.15%; The positive diagnostic value is 75.71%, the negative diagnostic value is 89.15%. APACHEII scale: abdominal pressure on the first day with a cut-off point of 23.8 cmH₂O has the ability to predict early pancreatitis. Severe level with sensitivity 98.55%; Specificity 87.76 %; positive diagnostic value 86.67%; negative diagnostic value 90.12%.

Figure 1. ROC curve of abdominal pressure predicting acute pancreatitis according to the RANSON scale (AUC: 0.87)

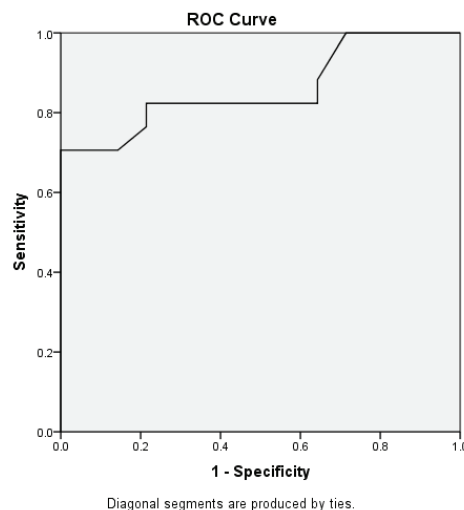


Figure 2. ROC curve of abdominal pressure predicting acute pancreatitis according to the IMRIE scale (AUC:0.85)

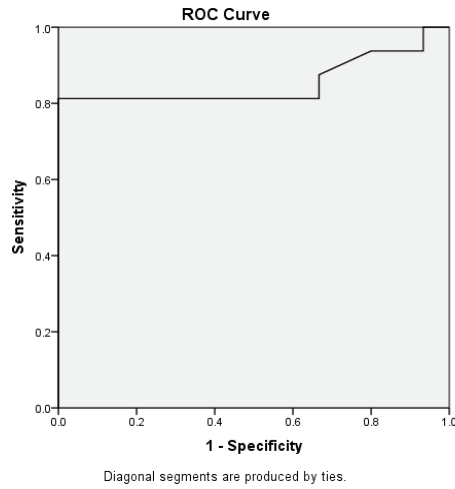


Figure 3. ROC curve of abdominal pressure predicting acute pancreatitis according to the APACHE II scale (AUC: 0.95)

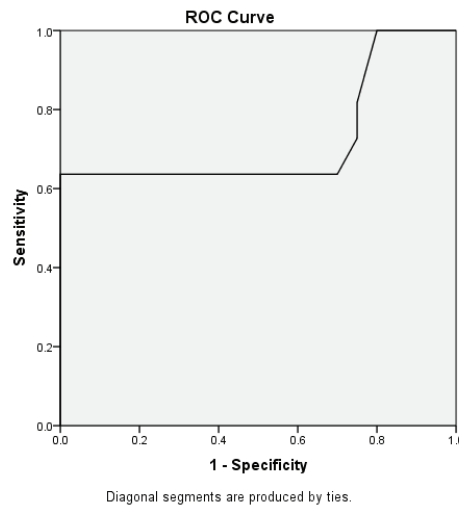
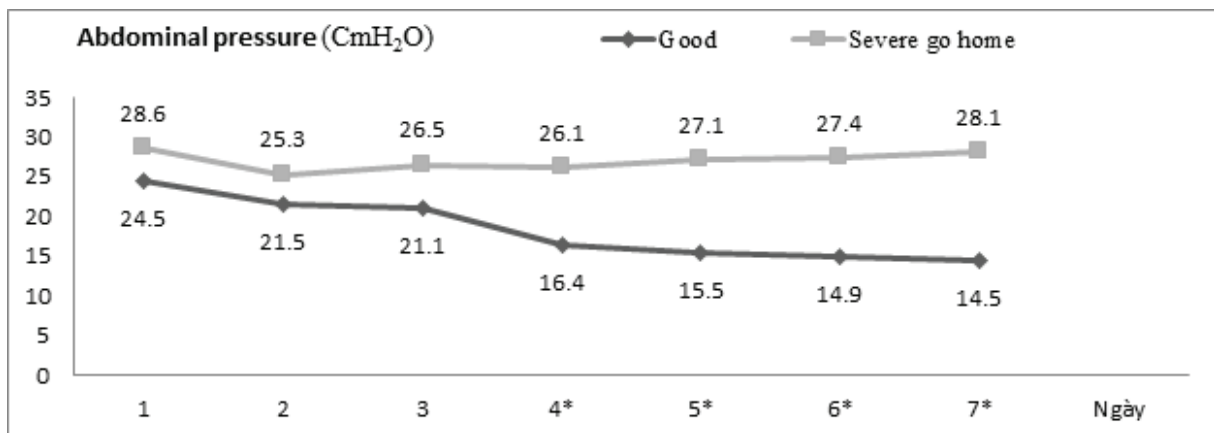
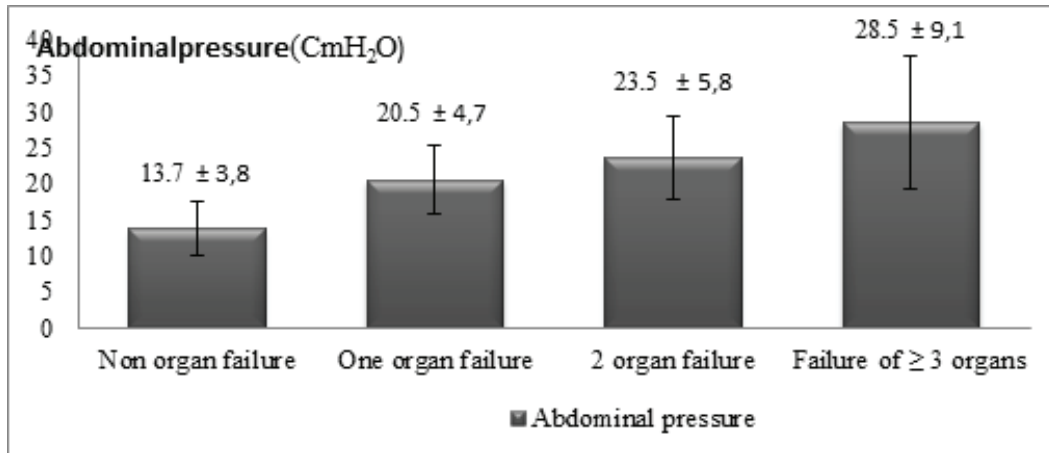


Figure 4. Evolution of abdominal pressure in the recovery-recovery group and the severe patient returning home group



In the recovery group, abdominal pressure returned to normal from day 4. In the severe group, abdominal pressure tended to change little and gradually increase in the first week.

Figure 5: Relation between the number of failing organs and the degree of increased abdominal pressure



In the group of patients without organ failure, abdominal pressure did not increase. 1 organ failure, increased abdominal pressure level I, II. Failure of ≥ 3 organs, increased abdominal pressure grade III, IV

4. DISCUSSION

Age and gender characteristics of patients in the study

Patients in the study were 55.1 ± 20.5 years old, equivalent to Nguyen Huu Huan’s study of 52 ± 16.32 years old, and author De Waele’s study of 53 years old. [4], [5] In our study, the male proportion accounted for 79.6%, while the author Dao Xuan Co’s 79.7%. [6]

Characteristics of acute pancreatitis and degree of increased abdominal pressure

Our study results in Table 3 show that 19 patients had increased abdominal pressure, accounting for 61.3%. In particular, the level of increased abdominal pressure level I: 19.4%, level II: 22.5%, level III: 12.9% and level IV: 6.5%.

The results of our study are lower than those of Nguyen Dac Ca, the rate of increased abdominal pressure in acute pancreatitis is 69%; and respectively grade I 25%, grade II 19.4%, grade III 22.2% and grade IV 2.8%. [7] Perhaps because our study on a small number

of patients was small. However, another reason is the accuracy and change of abdominal pressure over time and according to treatment results. Many of our patients come to the hospital earlier because Nghe An General Friendship Hospital is a provincial hospital, so patients come to the hospital at an earlier stage.

Table 4 shows the scores that have been proven to have severe prognostic value in acute pancreatitis. The difference between the 2 groups suggests that patients with increased abdominal pressure also have a worse prognosis, requiring intervention. Effective treatment measures to improve treatment results, reduce mortality, and reduce severity

Research by author Dao Xuan Co also selected patients treated at the Intensive Care Department showed that 31.6% of patients did not have increased abdominal pressure, 22.6% had grade I increased abdominal pressure, 30% grade II, 10.5% grade III, 5.3% grade IV, group with increased abdominal pressure had Apachea II of 12.6 ± 3.8 and CTSI score of 8.5 ± 1.93 , group without hypertension Abdominal force had Apachea II of 5.6 ± 3.8 and CTSI score of 4.5 ± 1.7 . [6] Patients in our study had results similar to those of author Dao Xuan Co, with the group of patients with increased intracranial pressure having an Apachea II score of 12.5 ± 4.51 and a CTSI score of 12.5 ± 4.51 . 8.5 ± 1.64

Increased abdominal pressure and disease prognosis

Chart 1 of our study shows that there is a difference in the level of abdominal pressure every day, during the first week of treatment in the Intensive Care Department of the 2 groups - recovered and died or returned home. Marcos-Neira P's study also showed a similar mortality rate of 4% in patients without increased abdominal pressure, 20% of grade I, 30% of grade II, 40% of grade III, 66% of grade IV ($p < 0.001$) [8].

Analyzing the relationship between the number of failed organs and the level of increased abdominal pressure, the results of the study in chart 2 show that the average abdominal pressure increases with the number of failed organs, this difference is statistically significant. Similar to author Nguyen Dac Ca (2007) [7].

5. CONCLUSION

The average age was 55.1 ± 20.5 years; men: 77.4%. The rate of increased abdominal pressure in patients with acute pancreatitis is 61.3%. Classified according to the Balthazar classification, acute pancreatitis has 64.51% mild severity and 35.48% severe severity. According to the Atlanta criteria, mild acute pancreatitis is 45.16% and severe is 54.8%. Rate of increased abdominal pressure grade I: 19.4%; grade II: 22.5%; Grade III: 12.9%, Grade IV: 6.5%. Increased abdominal pressure has severe prognostic value according to the RANSON, IMRIE and APACHE II scales with the corresponding area under the curve of 0.86; 0.85 and 0.95. 1 organ failure, increased abdominal pressure level I, II. Failure of ≥ 3 organs, increased abdominal pressure grade III, IV.

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