SCIE DOI: 10.14744/scie.2022.03789
South. Clin. Ist. Euras. 2023;34(1):8-11

Original Article

Comparison of Ranson Criteria and HAPS Score for Prognosis of Patients with Clinical Monitoring due to Non-biliary Acute Pancreatitis

Zeynep Koç, Seydahmet Akın, Banu Boyuk, Özcan Keskin

Department of Internal Medicine, University of Health Sciences, Kartal Dr. Lütfi Kırdar City Hospital, İstanbul, Türkiye

Submitted: 26.01.2022
Revised: 11.03.2022
Accepted: 13.04.2022

Correspondence: Zeynep Koç, Sağlık Bilimleri Üniversitesi, Kartal Dr. Lütfi Kırdar Şehir Hastanesi, İç Hastalıkları Kliniği, İstanbul, Türkiye
E-mail: zynpkoc000@gmail.com

Keywords: Harmless acute pancreatitis score; non-biliary acute pancreatitis; Ranson score.

ABSTRACT

Objective: In our study, we aimed to compare the reliability of the Harmless Acute Pancreatitis Score (HAPS) score with the widespread, commonly used and reliable scoring system of the Ranson score in terms of prognosis prediction for non-biliary acute pancreatitis (AP) cases.

Methods: The study included 73 patients with diagnosis of non-biliary AP with mean age 48 years, admitted for clinical follow-up from January 2016 to June 2021. The Ranson and HAPS scores and clinical progression were compared. For clinical progression, duration of admission, final outcome, and presence of local or systemic complications were assessed.

Results: When HAPS and Ranson scores are compared, there was no statistically significant difference identified in the prognosis predictions for patients ($p>0.05$).

Conclusion: The Ranson scoring system, a scoring system with high reliability, is completed in 48 h, while the HAPS score is calculated with three criteria assessed on the patient's initial clinical admission. The HAPS score, with convenient use, was identified to be as reliable as the Ranson score for prognosis prediction of both mild and severe cases and may be safely used for prognosis of non-biliary AP cases in situations, where the Ranson score cannot be used.

INTRODUCTION

The incidence of acute pancreatitis (AP) is 34 people per 100,000 and this rate is increasing every day.[1] Non-biliary AP is an inflammatory disease characterized by abdominal pain with varying degrees of severity generally spreading from the epigastrium toward the back like a belt. It may have a broad variation in clinical progression from self-limiting mild disorder to fulminating disease.[2] The broad clinical portfolio has led to different prognostic scoring systems for prediction of prognosis and mortality over time. AP severity may be classified with a variety of scoring systems such as the Ranson score, BISAP score, and APACHE II score.[3] The Ranson scoring system is the scoring system used to determine AP severity for the longest duration of more than three decades.[4] The most commonly used Ranson score assesses five criteria at time of diagnosis and six criteria in the 48th h. Ranson score below 3 is mild AP, while six and above are assessed as severe AP with mortality reaching up to 40%.[5] The Harmless Acute Pancreatitis Score (HAPS) investigates the patient at time of diagnosis and is a practical scoring system. It assesses three parameters (lack of rebound, normal Hct and creatinine level) in the first 30 min of patient admission. If the three parameters are within normal intervals, it is qualified as mild AP.

Aim of the study

We planned to investigate whether the more practical HAPS score is as effective as the Ranson score for prediction of prognosis by comparing the Ranson criteria, which can be completed within 48 h, with the HAPS score using three criteria practically calculated during first assessment of the case for non-biliary AP patients.

MATERIALS AND METHODS

The study included patients aged 18 years and older mon-

itored due to non-biliary AP in the past 5 years in the internal medicine clinic. As biliary AP was excluded from the study, patients with stone in the biliary of pancreatic canal identified after clinical follow-up for preliminary non-biliary AP diagnosis, or with post-ERCP pancreatitis causing iatrogenic pancreatitis were excluded from the study. Patients with admission duration <48 h could not be included as the Ranson score could not be calculated. The HAPS score was calculated by examining lack of rebound of the abdomen, creatinine, and hematocrit during the first assessment of patients. The Ranson score was calculated at time of diagnosis and in the 48th h. The effects of these two scores on clinical monitoring of patients were investigated. Clinical follow-up longer than 7 days was assessed as "extended clinical monitoring." Prognosis assessment was based on hospitalization duration, transfer to the intensive care unit (ICU), and exitus.

Ethics committee approval was obtained.

Statistical analysis

Statistical analyses used the Number Cruncher Statistical System program. When assessing study data, descriptive statistical methods (mean, standard deviation, median, frequency, proportion, minimum, and maximum) were used. The fit of quantitative data to normal distribution was tested with the Kolmogorov–Smirnov, Shapiro–Wilk tests, and graphical analysis. Comparison of two groups of data without normal distribution used the Mann–Whitney U-test. Comparison of qualitative data used the Pearson Chi-square test and Fisher-Freeman-Halton exact test. Significance was assessed at $p<0.05$ level.

RESULTS

The study was completed with 73 cases, 46.6% women (n=34) and 53.4% men (n=39), in the Internal Medicine Clinic from January 2016 to June 2021. Cases participating in the study had ages varying from 22 to 89 years, with mean age of 48.67±18.30 years (Table 1).

Hospitalization durations varied from 2 to 22 days with mean of 6.2±4.7 days. Nineteen patients (26%) were hospitalized for more than 7 days and this situation was assessed as extended admission. When the advanced complications are examined; pleural effusion developed in two patients and pseudocyct developed in two patients. The hospitalization period of these cases was 7 days or more. In one patient, pancreatic necrosis was detected on the 4th day. All developed local and systemic complications were evaluated as poor prognosis. While 95% of patients were discharged, one patient (1.4%) was transferred to the ICU due to worsening clinical progression and two patients were exitus (2.7%). Based on final outcome (hospitalization duration, clinical outcome, presence of local, or system complications), 68.5% of patients were assessed as having good prognosis, while 31.5% had poor prognosis (Table 2).

There were no statistically significant differences between the HAPS and Ranson scores according to prognosis ($p>0.05$) (Table 3).

Table 1. Distribution of demographic and clinical features

Demographic features	n (%)
Sex	
Female	34 (46.6)
Male	39 (53.4)
Age (years)	
Mean±SD	48.67±18.30
Median (Min-Max)	50 (22–89)

SD: Standard deviation.

Table 2. Final outcome

Clinical features	
Hospitalization (days)	
Mean±SD	6.26±4.74
Median (Min-Max)	5 (2–22)
≤7 days	54 (74.0)
>7 days	19 (26.0)
Clinical final status	
Discharge	70 (95.9)
ICU	1 (1.4)
Ex	2 (2.7)
Prognosis	
Good prognosis	50 (68.5)
Poor prognosis	23 (31.5)

SD: Standard deviation; ICU: Intensive care unit.

Table 3. Assessment according to prognosis

	Prognosis		p-value
	Good prognosis (n=50)	Poor prognosis (n=23)	
HAPS Score			
Mild	30 (60.0)	11 (47.8)	[c]0.456
Moderate	19 (38.0)	12 (52.2)	
Severe	1 (2.0)	0 (0)	
Ranson Score			
Mild	36 (72.0)	12 (52.2)	[b]0.097
Severe	14 (28.0)	11 (47.8)	

[b]Pearson Chi-square test, [c]Fisher Freeman–Halton exact test.

DISCUSSION

A study assessing HAPS score[6] showed 98%, while another study[7] found 96.3% specificity for non-severe progression of AP. A variety of studies showed that patients with HAPS score of 0 did not have aggressive clinical pro-

gression.[8,9] HAPS is correlated with non-severe disease progression. It can be completed within nearly 30 min of clinical admission of AP cases with mild progression. HAPS score has high accuracy level (98%) and allows the opportunity to rapidly determine patients who do not require intensive care. Thus, the use of HAPS score may provide significant savings in hospital costs.[6,7] Ng et al.[10] could not confirm the benefit of HAPS score in prediction of mild AP.

The 11 objective components of the Ranson score have significant prognostic importance for prediction of AP severity.[11] A meta-analysis including 110 studies showed that the Ranson score was a poor predictor.[5] The Ranson score may be consistently compared with other new scoring systems, which displays prognostic accuracy and the time interval of 48 h required for accurate calculation may be considered a natural strength rather than a weakness. These aspects combined with the relative ease of use, practicality, and universality of the score advocate for the continuing use of the Ranson score in modern clinical practice.[12]

Al-Qahtani et al.,[13] in a study comparing the Ranson and HAPS scores, showed 87% of disease severity in patients in the HAPS group that was accurately predicted with 98% sensitivity and 77 to 96% accuracy. The Ranson score provided fully accurate prediction; however, it was not as practical as the HAPS score due to assessment taking 48 h. In our study, there was no significant difference between the HAPS and Ranson scores according to prognosis of patients ($p>0.05$). When patients are assessed according to hospitalization durations, discharge status, transfer to intensive care, and development of local and/or systemic complications, both scores were observed to provide similar results in terms of prognosis. The completion of the Ranson score calculation in 48 h is not practical for prognosis prediction in non-biliary AP cases, though it is still the most frequently used scoring system in clinical practice. HAPS comprises three criteria that can be assessed within the first 30 min of monitoring the case and provides an idea about prognosis at time of diagnosis and can be assessed once. Most studies show that HAPS score has high reliability for cases qualified as "mild AP," while reliability is low for cases predicted to be "severe AP." However, our study shows that there was no significant difference in cases qualified as mild and severe AP in parallel with the Ranson score. All these indicate that the Ranson score with long-term calculation and the HAPS score with convenient use may predict severe cases with reliability as high as prediction of mild cases. Our study was completed with limited cases and more accurate results will be obtained by assessing larger patient groups in terms of adequate patient numbers.

CONCLUSION

Although the HAPS score is stated to have low reliability in predicting severe AP cases in the literature, no significant differences were shown between the two scoring systems for prediction of mild and severe AP cases based on the Ranson score. This shows that the practical and easy-to-use HAPS score has high use ability and predictivity instead of the Ranson score, in situations where the Ranson score, which is completed in 48 h, cannot be used.

Ethics Committee Approval

This study approved by the Kartal Dr. Lütfi Kırdar City Hospital Clinical Research Ethics Committee (Date: 22.06.2021, Decision No: 2021/514/204/18).

Informed Consent

Retrospective study.

Peer-review

Externally peer-reviewed.

Authorship Contributions

Concept: Z.K., S.A.; Design: Z.K., Ö.K., B.B., S.A.; Supervision: Z.K., Ö.K., B.B., S.A; Fundings: Z.K.; Materials: Z.K.; Data: Z.K.; Analysis: Z.K.; Literature search: Z.K.; Writing: Z.K., Ö.K., B.B., S.A.; Critical revision: Z.K., Ö.K., B.B., S.A.

Conflict of Interest

None declared.

REFERENCES

1. Lee PJ, Papachristou GI. New insights into acute pancreatitis. Nat Rev Gastroenterol Hepatol 2019;16:479–96. [CrossRef]
2. Jha RK, Ma Q, Sha H, Palikhe M. Acute pancreatitis: a literature review. Med Sci Monit 2009;15:RA147–56.
3. Siregar GA, Siregar GP. Management of severe acute pancreatitis. Open Access Maced J Med Sci 2019;7:3319–23. [CrossRef]
4. Ranson JH, Rifkind KM, Roses DF, Fink SD, Eng K, Spencer FC. Prognostic signs and the role of operative management in acute pancreatitis. Surg Gynecol Obstet 1974;139:69–81.
5. De Bernardinis M, Violi V, Roncoroni L, Boselli AS, Giunta A, Peracchia A. Discriminant power and information content of Ranson's prognostic signs in acute pancreatitis: a meta-analytic study. Crit Care Med 1999;27:2272–83. [CrossRef]
6. Lankisch PG, Weber-Dany B, Hebel K, Maisonneuve P, Lowenfels AB. The harmless acute pancreatitis score: a clinical algorithm for rapid initial stratification of nonsevere disease. Clin Gastroenterol Hepatol 2009;7:702–5; quiz 607. [CrossRef]
7. Oskarsson V, Mehrabi M, Orsini N, Hammarqvist F, Segersvärd R, Andrén-Sandberg A, et al. Validation of the harmless acute pancreatitis score in predicting nonsevere course of acute pancreatitis. Pancreatology 2011;11:464–8. [CrossRef]
8. Sayraç AV, Cete Y, Yiğit Ö, Aydın AG, Sayrac N. Utility of HAPS for predicting prognosis in acute pancreatitis. Ulus Travma Acil Cerrahi Derg 2018;24:327–32. [CrossRef]
9. Ma X, Li L, Jin T, Xia Q. Harmless acute pancreatitis score on admission can accurately predict mild acute pancreatitis. Nan Fang Yi Ke Da Xue Xue Bao 2020;40:190–5.
10. Ng DWK, Gao Y, Furqan MS, Bonney GK, Kow AWC, Madhavan K, et al. Validation of harmless acute pancreatitis score (HAPS) in a tertiary asian medical institute. HPB 2019;21:406–7. [CrossRef]
11. Basit H, Ruan GJ, Mukherjee S. Ranson criteria. 2022 Sep 26. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022.

12. Ong Y, Shelat VG. Ranson score to stratify severity in Acute Pancreatitis remains valid - Old is gold. Expert Rev Gastroenterol Hepatol 2021;15:865–77. [CrossRef]

13. Al-Qahtani HH, Alam MKh, Waheed M. Comparison of harmless acute pancreatitis score with Ranson's Score in predicting the severity of acute pancreatitis. J Coll Physicians Surg Pak 2017;27:75–9.

NonBilier Akut Pankreatit Nedeni ile Klinik Takibi Yapılan Hastaların Prognoz Değerlendirmesinde Ranson Kriteri ve HAPS Skorunun Karşılaştırılması

Amaç: Çalışmamızda non-bilier akut pankreatit (AP) olgularında HAPS skorunun güvenirliğinin; yaygın, sık kullanılan ve güvenilir bir skorlama sistemi olan Ranson skoru ile prognoz tahmini açısından karşılaştırmayı amaçladık.

Gereç ve Yöntem: Ocak 2016–Haziran 2021 arasında klinik takibi yapılan yaş ortalaması 48 olan Non Bilier AP tanılı 73 hasta çalışmaya dahil edildi. Ranson ve HAPS skoru ile klinik seyirleri mukayese edildi. Klinik seyirde yatış süreleri, nihai son karar ve lokal ya da sistemik komplikasyon varlığı değerlendirildi.

Bulgular: HAPS ve Ranson skorun mukayese edildiğinde hastaların prognoz tahmininde istatistiksel olarak anlamlı fark tespit edilmemiştir ($p>0.05$).

Sonuç: Güvenirliği yüksek bir skorlama sistemi olan Ranson skorlama sistemi 48 saatte tamamlanmakta olup HAPS skoru ise hastanın ilk klinik kabulünde değerlendirilen 3 kriter ile hesaplanmaktadır. Kullanım kolaylığı olan HAPS skoru gerek hafif gerekse şiddetli olgularda prognoz tahmininde Ranson skoru kadar güvenilir tespit edilmiş olup Ranson skorunun kullanılmayacağı durumlarda NonBilier AP olgularında prognoz tahmininde güvenle kullanılabilir.

Anahtar Sözcükler: HAPS skoru; non-bilier akut pankreatit; Ranson skoru.