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STUDY OF THE HARMLESS ACUTE PANCREATITIS SCORE IN PREDICTING THENON-SEVERE COURSE OF ACUTE PANCREATITIS

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Abstract

Background: The Harmless Acute Pancreatitis Score (HAPS) is a scoring algorithm to identify patients with non-severe acute pancreatitis. This studyaimed to determinethe usefulness of HAPS in identifying patients who develop a mild AP and evaluate its predictability value.

Methods: It was a prospective type of study conducted in Velammal Medical College, MGR University, Tamilnadu from January 2023 to January 2024 with a sample size of 50 patients. It included all first attack of acute pancreatitis of either gender over the age of 18 yrs. Patients with co-morbid disorders of CVS, RS, Renal system, anaemia, and smokers were excluded. HAPS, Ranson's score, and CT-severity index scores were calculated for all the patients. The aetiology of Acute pancreatitis was determined as alcoholic, biliary, idiopathic, and the patients were followed up for 1-monthpost-discharge(need for readmission & the cause). Outcomes like duration ICU stay, local and systemic complications were also assessed.

Results: The sensitivity, specificity, positive predictive value & negative predictive value of HAPS score was 92.85%, 81.81%, 86.67%, 90% respectively. The Cohen's kappatest showing the measurement of agreement between Ranson's score and HAPS was 0.1 with regards to the non-severe course and 0.3withrespect to the severe course. Fischer's exact test with respect to a etiology was found to be significant in HAPS. Paired t-test with p-value <0.05 significance was performed on Haematocrit and Sr.creatin eat the time of admission, was found to be significant; BUN value at the time of admission was found to be not significant p=0.11.CTSeverityindex:mild (0-3): n=27 (54%), moderate (4-6): n=18 (36%), severe (7-10): n=5 (10%).

Conclusion: HAPS is a highly sensitive & specific scoring algorithm that predicts a non-severe course of acute pancreatitis. HAPS might be

an additional tool in the clinical assessment of acute pancreatitis, where early screening is important to treat the patients at an optimal level of care.
Keywords: Acute Pancreatitis, HAPS, Ranson Score, CT-Severity Index

Introduction

The crippling limitations in making an accurate determination of the course and prognosis of acute pancreatitis through these biochemical markers alone, initiated the preliminary attempts to classify the disease based on clinical and pathological parameters.[1] Some even classified acute pancreatitis on the basis of etiology, however these could not be widely applied to daily clinical practice.[2]

Today, we have various established scoring systems designed to predict the course of the disease like Ranson'sscore,Glasgowcriteria,APACHE-II.Thesescoring systems are designed to predict the severe course of acute pancreatitis.[3,4] However, these scoring systems come with limitations like complexity, 48 hrs of hospital admission, multiple parameters requiring sophisticated equipment.[5]Recently, the Harmless Acute Pancreatitis Score (HAPS) was established to identify cases with non-severecourseof acute pancreatitis. It contains fewer parameters and can be used to stratify non-severe acute pancreatitis within short time of presentation. [6]The aim of our study is to determine the usefulness of HAPS in predicting non-severe course of Acute pancreatitis and evaluate its predictability values.

Methodology

The study was conducted on 50 patients diagnosed with acute pancreatitis in Velammal Medical college, MGR University, Tamilnadu. The duration of the study was from January 2023 to January 2024.

Data such as name, age, etc. was recorded. The clinical features on presentation especially signs of peritonitis, type of pancreatitis, imaging results (CT-severity index), local complications: (fluid collections, necrosis), systemic complications: like organ failure, need for organ support, nosocomial infection related complications like pneumonia, urinary tract infections, infection of pancreatic necrosis, central line sepsis were recorded. If the patient needed ICU admission, in case he/she did, then length of stay in ICU was also noted.Any interventions & surgical procedures Mortality, if any.

Patients were followed up for 1 month after discharge, in case they needed readmission within a month, need for readmission and cause behind it were also analysed.The results were compiled and subjected to statistical analysis using the Mann- Whitney U test. P value less than 0.05 was regarded as significant.

Results

Table I Assessment of parameters

Parameters	Variables	Number
Etiology	Alcohol	38 (76%)
	Biliary	10 (20%)
	Idiopathic	2 (4%)
HAPS	Negative	20 (40%)
	Positive	30 (60%)
RANSON'S SCORE	score >3(severe)	21 (42%)
	score <3 (non-severe)	29 (58%)
CT severity index	mild (0-3)	27 (54%)
	moderate (4-6)	18 (36%)

	severe (7-10)	5 (10%)
ICUSTAY	Yes	22 (44%)
	No	28 (56%)

The etiology of Acute pancreatitis was alcohol in 38 (76%), biliary in 10 (20%) and idiopathic in 2 (4%). HAPS negative (severe course): 20 (40%) and HAPS positive (Non-severe course): 30 (60%). Ranson's score >3(severe) was seen in 21 (42%) and Ransons's score <3 (non-severe) in 29 (58%). CT severity index was mild (0-3) in 27 (54%), moderate (4-6) in 18 (36%) and severe (7-10) in 5 (10%). ICU stay was seen in 22 (44%) and not seen in 28 (56%)

Table II Comparison of HAPS status and aetiology

Aetiology	**HAPS+**	**HAPS-**	**Total**
Alcohol	27	11	38
Biliary	1	9	10
Other	2	0	2
Total			50

No. of patients of alcoholic etiology and HAPS positive was 27(54%) and HAPS negative is 11 (22%). No. of patients of biliary etiology and HAPS positive was 1 (2%) and HAPS negative is 9 (18%). No. of patients of idiopathic etiology and HAPS positive was 2(4%) and HAPS negative is 0 (0%).

Table IIIA nalysis of HAPS in predicting asevere course

	NoICU stay	**ICU stay**		
HAPS+	26	4		Sensitivity= 92.85
HAPS-	2	18		Specificity=81.81
				PPV= 86.67
				NPV=90

The sensitivity, specificity, positive predictive value & negative predictive value of HAPS score was 92.85%, 81.81%, 86.67% & 90% respectively.

Table IV Analysis of RANSON'S score in predicting a severe course

	No ICU stay	ICU stay		
Ranson<3	26	3		Sensitivity= 92.85
Ranson >3	2	19		Specificity=86.36
				PPV= 89.65
				NPV=90.47

Thesensitivity,specificity,positivepredictivevalue&negativepredictivevalueof Ranson's score was 92.85%, 86.36%, 89.65% & 90.47% respectively.

Discussion

The efficiency ofHAPS in predicting the non-severe course of AP was established even outside the settings in which it was initially studied[7]. In the current study, we have analysed the Harmless Acute Pancreatitis Score in the Indian patients belonging to the Southern part of the country, who were admitted in our hospital for acute pancreatitis.

According to the study by Lankisch et al[8], which introduced HAPS, the specificity was 97%, PPV of 98% in predicting the non-severe course in AP. Followed by which there was a similar study conducted in Sweden by V.Oskarssonet al[9] which validated the HAPS scoring system and produced similar results, inthis study the specificity of HAPS was 96.3% and a PPV of 98.7%. In study conducted in North-eastern part of India by Talukdar et al[10], it was found out that HAPS had a specificityof 85.7%, PPV of 93.8%. In our study HAPS had the specificityof 81.81% and PPV of 86.7 % the probable reason behind that might be small sample size.

The main criticism of the original article by Lankischetal[8]wasthatthestudy did not mention about the hospital interventions like ICU admission and number of days, fluid resuscitation etc. In our study the number of patients who needed ICU stay was 22 i.e. 44%.

In a study conducted by Talukdaretal[10], parallel evaluation of standard scoring systems like Ranson's scorefor comparison and correlation with HAPS was not done. Our study found out that the specificity and PPV of Ranson's score was 86.36% and 89.65% respectively. Both the results of HAPS and Ranson were comparable.Hence to determine the agreement between HAPS and Ranson's score Cohen's kappa was calculated which suggested slight agreement with respect to predicting non-severe course and fair agreement with respect to predicting a severe course. A retrospective study conducted in Turkey by Seyrac et al[11]suggested a slightly low agreement on calculation of Cohen kappa. Furthermore, the study by Seyrac et al[11] reported cholelithiasis as the most common cause 89 pts (61.8%) and alcoholic pancreatitis was only 1.4%. In the current study, alcohol was the most common cause 76% followed by 20% Biliary, the possible explanation between such difference is, lower chronic alcohol consumption ratios in Turkey. HAPS was statistically significant in prediction of non-severe course and poor prognosis(p=0.013). In the same study HAPS had aspecificityof 81% and PPV of 96%. Our study HAPS had a specificity of 81.81% and PPV of 86.67%. The study by Seyracetal[11] had a handicap that it was a retrospective study and included no patient follow up.

In the study conducted by Oskarssonetal[9],various parameters were analysed. These included aetiologies of AP which in this study, most commonly was biliary 36.4% followed by idiopathic 27.3% and alcohol came at 26.5 %. This study also concluded that aetiology of AP does not influence the course of the disease. The limitation in this study was that there

was no patient follow up after discharge and an established scoringsystem likeAPACHE-IIorRanson'sscorewerenot calculatedfor reference and measurement of agreement. There was no patient follow up after discharge and analysis of outcomes.

To fill these gaps in literature in our study we followed up the patients for 1 month and found that 15 (30%) patients needed readmissions within 1-month period, out of which only 4 (8%) were HAPS positive. The most common reason for read mission in these cases was, that patient had continued consumption ofalcohol after discharge 6 (12%). The second common cause was pancreatic necrosis 5 (10%) followed by recurrent biliary disease. Outcomes like ICU stay were also analysed, the average ICU stay was found to be 6 days. Role of HAPS in predicting local and systemic complications was also studied. To predict local complications, the specificity was 81.81%, PPV was 93.33%, sensitivity was 71.79%, NPV was 45%. To predict systemic complications, the specificity was 100%, PPV was 100%, sensitivity was 71.42%, NPV was 40%. These results might probably be due to small sample size in our study.

In the study conducted by Talukdaretal[10] in Indiancohort of 103 patients out which 23 were excluded, 47(58%) were found to be HAPS positive. Out of the 47 patients 44 (93.6%) had a non-severe course.In our study 30 (60%) cases were HAPS positive and 28 (93.3%) had a non-severe course. In both the studies the most common aetiology for AP was alcohol. Talukdar et alin their study also calculated p-values of individual parameters like haematocrit, BUN & creatinine in predicting outcomes and all the 3 were found to be statistically significant, in our study haematocrit and creatinine were statistically significant.

In the Indian scenario, this system can be very effective due its simplicity, duplicity, affordability and the fact that it is achievable in any medical setup and in any area including urban to remote.[12]

Conclusion

HAPS is a simple and effective tool with promising results. Introduction of this scoring system in a stepwise fashion into our daily clinical practice might help treat patients predicted to have a non-severe course more efficiently. Such patients can be admitted in wards instead of ICU avoiding unnecessary aggressive interventions. Hence adequate fluid therapy and early enteral feeding in these cases will help reduce the overall hospital stay.

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