

# Comparison of APACHE II and Ranson Score as Prognostic Indicator in Acute Pancreatitis

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**Abstract:** Acute pancreatitis is defined as an acute condition presenting with abdominal pain and is usually associated with raised pancreatic enzyme levels in the blood or urine as a result of pancreatic inflammation. On account of the difference in outcome between patients with mild and severe disease, it is important to define that group of patients who will develop severe pancreatitis. Various scoring systems have been introduced, such as the Ranson's and Glasgow scoring systems. The APACHE II scoring system, used in intensive care units, can also be applied. Here we discuss about a study that was conducted which showed APACHE II scoring system as a better prognostic marker in comparison to Ranson's score in patients with acute pancreatitis.

**Keywords:** Acute Pancreatitis, APACHE II score, Ranson score

## 1. Aim of this Study

To study all the patients of Acute pancreatitis admitted in Bharati Hospital in a span of 2 years and to make a comparative study of Ranson's and APACHE II scoring system within 48 hours of hospital admission. To relate diagnostic serum Amylase levels and severity of acute pancreatitis and correlate blood sugar level with severity of acute pancreatitis and eventually to set up a protocol for management of Acute pancreatitis.

## 2. Materials and Methods

30 patients diagnosed as acute pancreatitis on USG or CT scan were included in the study. On admission and at 48 hours relevant investigations were sent to calculate Ranson's and Apache II score. Based on Ranson's and Apache II scoring system patient was shifted to either ward or ICU for further management. Patients clinical condition was assessed every 6 hourly. At the time of discharge following data was noted:

- 1) Day of discharge
- 2) Clinical condition at discharge
- 3) Any complication during hospital stay.

## 3. Discussion

The study included 30 patients of acute pancreatitis admitted in medical and surgical wards and following parameters were considered:

- 1) **Age Distribution**—Patients included in our study were in range of 20-79 years of age with largest age group between 30-39 years with declining incidence in extremes of age. Mean age was 43.28. This is consistent with the fact that alcoholism which was the commonest cause of pancreatitis is most prevalent in this age group. (Bapat R.D. 1986—mean age 40, Ranson 1997—mean age 44)
- 2) **Sex Distribution**— Study included 22 males and 8 females. The reason for this discrepancy was because

the commonest etiological factor was alcoholism which is more common in males. (Kaushik S.P. 1983 Chandigarh 256 patients -145 males, 111 females. Ranson 1977 USA, 100 patients -79 males, 21 females. Blamey (Glasgow) had 149 males and 195 females—gall stones commonest etiology in Britain.)

- 3) **Etiology**—Alcohol dominated the list of etiology (53%), 30% idiopathic (Ranson 1977 U.S 74% alcohol induced pancreatitis Blamey 1984 Britain 44% gallstone induced, 33% alcohol induced)
- 4) **Duration of alcoholism and nature of consuming alcohol**— Patients consuming alcohol for more than 2-5 years had a much greater risk of developing pancreatitis. Risk was much more in patients who indulged in chronic alcohol consumption interspersed with heavy binge drinking as compared to patients who consumed alcohol in a limited quantity. (Ranson 1982 found that episodes of acute pancreatitis usually occur after a 6- 8 year period of heavy alcohol ingestion).

### Symptomatology

- 1) **Pain**— Most cardinal symptom seen in 100% of our patients. 90% had typical pain. Mean duration of pain 48.42 hours (Gambill had shown duration of pain lasts for 2-6 days in most cases, painless pancreatitis usually occurs in chronic relapsing pancreatitis but was not seen in our study).
- 2) **Nausea (86%) vomiting (56.2%) and retching (40%)** (Soergel K. mentions this symptoms occur in 80% patients)
- 3) **Obtundation (3%) fatal outcome** (According to Bank's clinical criteria obtundation has a grave prognosis. Colmant and Notenius reported this symptom in 4% cases in their study)

### Signs -

- 1) **Tachycardia > 120/min** in 70% patients
- 2) **Fever (>99 F)** in 46.6% cases. (Kaushik S.P., Verma R. noted in 7.2%)

- 3) Paralytic ileus and severe abdominal distension seen in 40% , all these patients had severe attack
- 4) (Gambill has noted that patients with these signs have severe necrotising pancreatitis with widespread necrosis. Kaushik S.P. ,Vohra noted abdominal distension in 8.3% )
- 5) Dyspnea was seen in 6% cases(3 patients), 2 patients had ARDS and had a fatal outcome. (Though transient hypoxemia has been noted by Ranson to occur in 50% patients 1/3<sup>rd</sup> of these progress to significant respiratory insufficiency. According to then dyspnea is an ominous sign.)

**Laboratory Diagnosis-**In our study laboratory diagnosis of acute pancreatitis was done by estimation of serum amylase.Levels of serum amylase >400 were taken as significant(Greenberg Harrison's Principle of internal medicine 1994. 1520-1530)

20% of radiologically diagnosed acute pancreatitis cases had normal serum amylase levels and levels of serum amylase levels did not correlate with severity of attack.

**Severity of attack-**

- Mild attack a(<7 days of intensive care ,complete recovery ,no complications) was seen in 80% cases (Jaiswal M.S.D. Sahi found 76.6% mild cases in their study)
- Severe attack was seen in 20% (Jaiswal and Sahi showed 23.44% severe attacks)

#### 4. Result

**Radiological diagnosis** –All patients underwent plain X ray abdomen and USG. Plain x-ray showed distended air filled bowel loops in 3 patients signifying paralytic ileus.UsG detected gall stones in all 5 patients of gall stone induced pancreatitis. In our study retroperitoneum could not be visualized in 80 % cases( all usg were done in emergency so bowel preparation was not good) (Macer ,Bittner 1986 in their study 395 patients ,24% could not be diagnosed as pancreatitis on usg due to bowel gas collection.A sensitivity of 70.8% for USG was recorded in their study.

#### Ranson's criteria

Agarwal N.Pitchmoni described Ranson's score as a yard stick for grading severity of acute pancreatitis.They found a complication rate of only 4% for patients with < 3 signs and 89% for those with 3 or more signs. In Ranson's study -

Mortality	Criteria
6.9%	0-2
16%	3-4
40%	5-6
100%	>6

(Mac Mohan M.J. found accuracy of Ranson's score to be 83% in predicting severe attacks )

#### APACHE II

1<sup>st</sup> described in 1981 by Knaus and modified in 1985(Wilson ,Health and Imrie in 1990 tested APACHE II score of > 8 provided a sensitivity of 82% .) For Ranson's

in our study of 30 patients ,total number of patients scoring >3 were 16 out of which 11 had complications (68.5%) and the rest 5 patients did not develop any complications (31.25%) For APACHE II ,15 patients had scored >8 .out of 15 patients 12 developed complications (80%) and 1 expired.Only 3 patients did not develop any complications even though the score was >8 . The total APACHE II scoring system was found to correlate well with the final outcome.

#### 5. Conclusion

Apache II scoring system had a better predicting value in initial 48 hours of attack as compared to Ranson's criteria.Apache II was more easy to perform, quick and accurate when compared to Ranson's criteria for predicting complications.Serum Amylase was a good indicator for predicting complications and change in management.Blood sugar levels done on day of admission had no much role in predicting complication and change in management .A standard protocol was followed for all Patients from diagnosis to follow up.

#### References

- [1] Adams James T ,Libertino John A, Schewartz Seymour I : Significance of an elevated serum amylase. Surgery 63 : 877-884,1968.
- [2] H, Johnson Willard C, SpechlerSturat J, Wetzner Steven m, Snider James M,Langevin Eugene Agarwal , Pitchumoni CS. : Assessment of severity in acute pancreatitis. Gastroenterology 86 : 1385-1391,1991.
- [3] Anand VJ, Rana BS, Ananda A : Pancreatic biopsy : A comparison of two techniques. Abstract, Iniiian J Gastroenterol 7 : A4,1989
- [4] Aziz Salim, Bergdahl L, Baldwin JL. Weiss LM, Jamieson SW, OyerPe, Stinson EB, Shumway NE : Pancreatitis after cardiac and cardiopulmonary transplantation . Surgery 97: 653-660,1983
- [5] Balthazar Ej, RolinsonDL,Megabow AJ, Ranson JHC: Acute Pancreatitis : Value of CT in establishing prognosis. Radiology 774 :331-336,1990
- [6] Bapat RD , NazarathMM,Zkulkarni AG, Shah AB :Prognostic markers in acute pancreatitis \_A. prospective study, India journal of Gastroenterol 5 : 113-115,1986
- [7] Bernard Claude : Memoir on the pancreas and on the role of pancreatic juice in digestive processes particularly digestion of neutral fat. Academic Press, 1985.
- [8] Blarney Sl, Imrie CW, O'Neill J, Gilmour W.H., Carter .C: Prognostic Factors in acute pancreatitis, gut 25 : 1340-1346,1984
- [9] Bradley Edward L, Clements JL ,Gonzalez AC : The natural history of pancreatic pseudocysts: a united concept of management. The American Journal of surgery 137 : 135-139, 1979.
- [10]Bradley Edward L : Antibiotics in acute pancreatitis – Current status and future direction. The American journal of Surgery, 158:472-477,1989
- [11]Cameron JL, Capuzzi DM, ZuidemaGD , Marigolds S : Acute parasites with hyperlipedemia. The America Journal of Medicine 56: 482-487,1974

- [12] Chhuia RS, Sing K, Kohli JS, Sing KP : C-reactive proteins and prognosis of acute pancreatitis,. Abstract, India J Gastroenterol 10:A70,1991
- [13] Clavien PA, Burgan S, MoosaAR : serum enzymes and other laboratory tests in acute pancreatitis. Brit J Surgery 76.-1234-1243,1989
- [14] DagliAJ , Moos JS, Sgaujg WA : Acute pancreatitis as a complication of diazenon poisoning. JAPI 29 : 794-95,1981.
- [15] Condoin JR, Davies I, Knight MJ, Day J : Aetiology of hypocalcaemic in acute pancreatitirts., Br. J Surg,62 : 115-118,1975.
- [16] Dammann HG, Grabbe E, RungeM : Computed tomography and acute pancreatitis. The lancet 2 : 86,1980.
- [17] Dhawan SS, AcastaJ ,Poppiti Robert J, Barkin Jamie : "Subcutaneous fat necrosis associated with acute pancreatitis. Histochemical and electron microscopic findings . The American Journal off Gastroenterology 85 : 1025-1027,1990
- [18] Dominguez-Mu noz JE, Carballow F, Garcia MJ, Simon MA ,Abago LR, de diego JM, : Clinical usefulness of polymorphonuclear elastase in predicting the severity of adcute pancreatitis- results of a multicentric study. Brits J. Surgery 78 : 1230-12324,1990.

