

Original Research Article

A double blinded comparative study between omega 3 fatty acid infusion versus octreotide infusion in acute pancreatitis

Narayanswamy T., Supreeth K.*, Sridhar G.

Department of General Surgery, Kempegowda Institute of Medical Sciences and Research Institute, Bangalore, Karnataka, India

Received: 16 March 2020

Revised: 06 September 2020

Accepted: 09 September 2020

***Correspondence:**

Dr. Supreeth K.,

E-mail: sup_41184@yahoo.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: Over decades the treatment of acute pancreatitis remains debatable with no common consensus on treatment guidelines, with some workers using octreotide infusion and some workers only relying on fluid therapy and symptomatic management. This double blinded comparative trial between omega 3 fatty acid infusion versus octreotide infusion and its response in cases of acute pancreatitis.

Methods: This is a study where a double blinded randomised control trial was undertaken in proven cases of acute pancreatitis and patients were given omega 3 fatty acid infusion and octreotide infusion and the observations were documented and followed upon. 50 cases were given omega 3 fatty acid infusion and other 50 were given octreotide infusion and the clinical response, symptomatic improvement was assessed and compared using BISAP and Marshal scoring systems and lipase levels.

Results: Omega 3 fatty acid infusion was found to be highly significant as compared to octreotide in cases of acute pancreatitis in terms of clinical improvement, reduced hospital stay, and SIRS.

Conclusions: Omega 3 fatty acid infusion is the future in cases of acute pancreatitis which is cheap and easily available with no side effects and reduces the morbidity and mortality in acute pancreatitis with reduced hospital stay in turn resulting in overall reduced medical expenditure.

Keywords: Acute pancreatitis, Octreotide, Omega 3 fatty acid infusion, Pancreas

INTRODUCTION

Acute pancreatitis is a life-threatening illness which is characterized by sudden inflammation of the pancreas.¹ The yearly incidence in the United States has been reported to be 70-80 new cases per 100,000 population and has increased over the last decade.² However, the true incidence and prevalence of pancreatitis in India is unknown as establishing an accurate diagnosis is difficult and are under reported.³ Aggravated acinar cell injury causing heightened immune response, resulting in pancreatic necrosis and generation of free radicals causing; SIRS and distant organ damage resulting in

MODS. Hence, attempts to enhance immune function, suppress the hyper inflammatory responses and re-establish tissue and organ homeostasis in AP patients have been made in clinical practice. The omega-3 fatty acids (ω -3 FA) can alter production of cytokine, modulate inflammatory and immunological response and thus be expected to lower the rates of infectious complications.⁴ A Cochrane review has mentioned among majority of the interventions, octreotide was associated with fewer serious adverse events and a lower proportion of people with organ failure.¹ A lot of research into different medical treatments for the treatment of acute pancreatitis are happening, however, it is not clear about the benefits

each treatment has, or indeed if any medical treatment is beneficial apart from supportive treatment.¹

Diagnosis of acute pancreatitis

Diagnosis of acute pancreatitis requires two of the following three features; abdominal pain consistent with acute pancreatitis (acute onset of a persistent, severe, epigastric pain often radiating to the back); serum lipase activity (or amylase activity) at least three times greater than the upper limit of normal and characteristic findings of acute pancreatitis on contrast-enhanced computed tomography (CECT) and less commonly magnetic resonance imaging (MRI) or transabdominal ultrasonography.

2012 revision of Atlanta classification and definition

This classification identifies two phases (early and late): Mild acute pancreatitis, which is characterized by the absence of organ failure and local or systemic complications; moderately severe acute pancreatitis, which is characterized by transient organ failure (resolves within 48 hours) and local or systemic complications without persistent organ failure (>48 hours) and severe acute pancreatitis, which is characterized by persistent organ failure that may involve one or multiple organs.

METHODS

Study design

This study was on double blinded randomised control trial.

Study period

Duration of the study was 12 months from November 2018 to October 2019.

Study area

The study was placed at Department of general surgery, Kempegowda institute of medical sciences and research centre (KIMS), Bangalore.

Study subjects

All 100 proven cases of acute pancreatitis admitted to the department of general surgery, KIMS, Bangalore.

Inclusion criteria were, age of 18 to 70 years, either sex satisfying Atlanta guidelines criteria any 2 out of 3 with systolic BP <90 mmHg, serum calcium <7.5 mg/dl, Usg/CT showing acute pancreatitis, serum amylase and lipase >3 times the normal, fitting to SIRS criteria (systemic inflammatory response syndrome) i.e., temp >100.4°F, heart rate >90 bpm, respiratory rate >20 cpm, WBC >12000 or <4000 per mm³. Exclusion criterias were, patients with history of immunodeficiencies, retro positive cases with primary hypertriglyceridemia, severe cardiac disease like acute myocardial infarction, congestive cardiac failure, with serum creatinine->2.0mg/dl with unavailable dialysis facility or received TPN in last 2weeks were excluded from the study.

Study procedure

Initial screening with blood inv (S. lipase and amylase), USG. Diagnosed with acute pancreatitis. Divided into two groups omega 3 fatty acids or octreotide by computer generated double envelop method injection. Omega 3 fatty acids infusion 60ml/hr over 4-5 hours (250 ml infusion) single dose on admission with 150 ml/hr IV fluid, pain relief with paracetamol/tramadol and H2 receptor antagonist and proton pump inhibitors. (50 patient Injection octreotide 100 mcg IV 8th hourly for 5 days with 150 ml/hr IV fluid (50 evaluation done, on admission and on day 5). Compared on the basis of biochemical values (serum lipase), clinical scoring system in pancreatitis (BISAP score), organ dysfunction score (Marshal scoring).

Statistical analysis

All the data were entered into Microsoft excel. The results were expressed using descriptive statistics (means, standard deviations, medians, range, proportions or percentages). The means or medians within the groups were compared using paired t test or wilcoxon signed rank test and between the groups by independent t-test and Mann Whitney U test. P<0.05 is considered statistically significant.

RESULTS

The two groups were comparable in terms of age (omega 3 fatty acid mean age group, 39.7 years and octreotide mean age group 43.1 years) (p=0.15, not significant) (Figure 1).

Table 1: Comparison of mean values of serum amylase and serum lipase between 2 study groups on day.

Parameters	Groups n=50	Mean	SD	Median	P value
Amylase	OMEGA 3 FA	709.14	631.03	440.00	0.59
	Octreotide	655.54	540.55	397.50	
Lipase	OMEGA 3 FA	278.60	178.44	211.50	0.88
	Octreotide	315.24	240.16	211.00	

Sex wise 43 male patients and 7 female patient in omega 3 fatty acid group and 45 male and 5 female patients in octreotide group (p=0.54, not significant) (Figure 2), 6 patients in omega 3 fatty acid group had gall stone induced pancreatitis and 6 cases in octreotide group had gall stone induced pancreatitis.35 patients were alcoholic in Omega 3 fatty acid group and 40 patients were alcoholic in octreotide group (Figure 3).

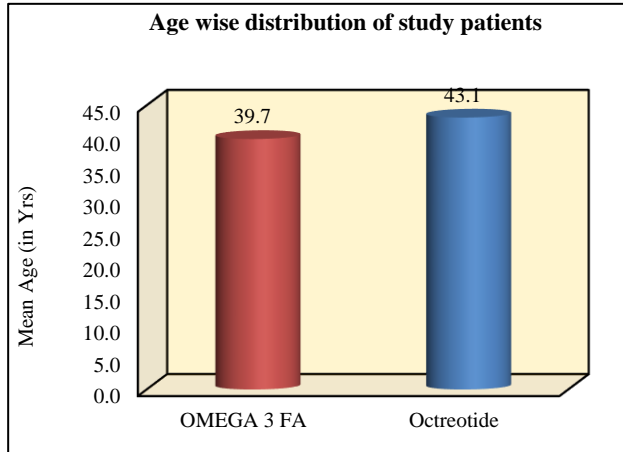


Figure 1: Age distribution.

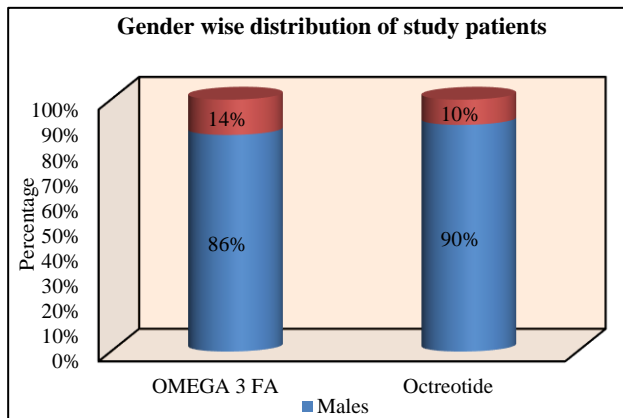


Figure 2: Sex distribution.

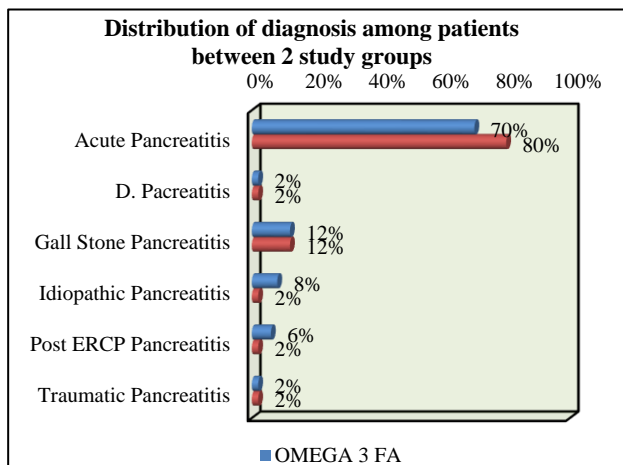


Figure 3: Etiological distribution.

The two groups were comparable in terms of demographics, etiology, On admission mean lipase levels in Omega 3 fatty acid group was mean 278.60 and octreotide group was mean 315.24 (p=0.88, not significant) and day 5 lipase levels in omega 3 fatty acid group was mean 105.24 and octreotide group was 149.06 (p=0.06, highly significant) (Table 2 and Figure 4).

Table 2: Comparison of mean values of BISAP score between 2 study groups on Day 1.

BISAP score				
Groups, n=50	Mean	SD	Median	P value
Omega 3 FA	2.10	0.86	2.00	0.63
Octreotide	2.04	0.90	2.00	

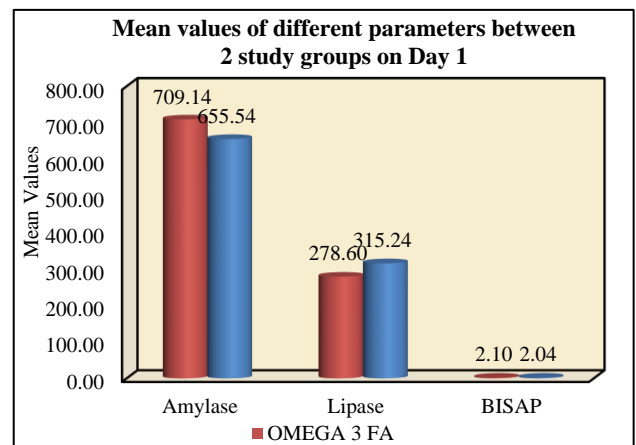


Figure 4: Comparison between serum amylase, serum lipase, and bisap score between 2 study groups on day 1.

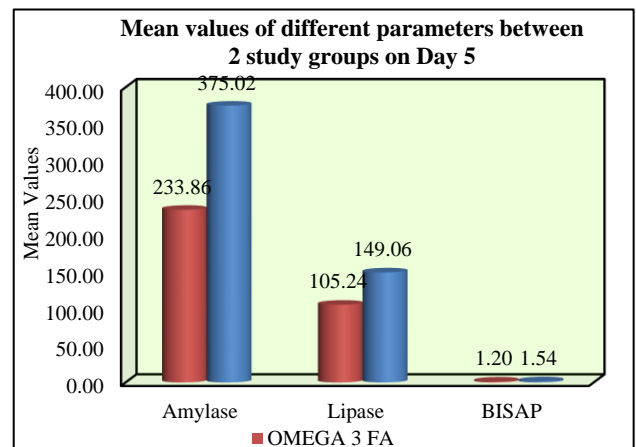


Figure 5: Comparison between serum amylase, serum lipase, and bisap score between 2 study groups on day 5.

On admission mean BISAP score in omega 3 fatty acid group was 2.10 and octreotide 2.04 (p=0.63, not significant), day 5 mean BISAP score in Omega 3 fatty acid group was 1.20 and octreotide 1.54 (p=0.06, highly significant).

acid group was 1.20 and octreotide was 1.54 (p=0.0001, highly significant) (Table 3 and Figure 5).

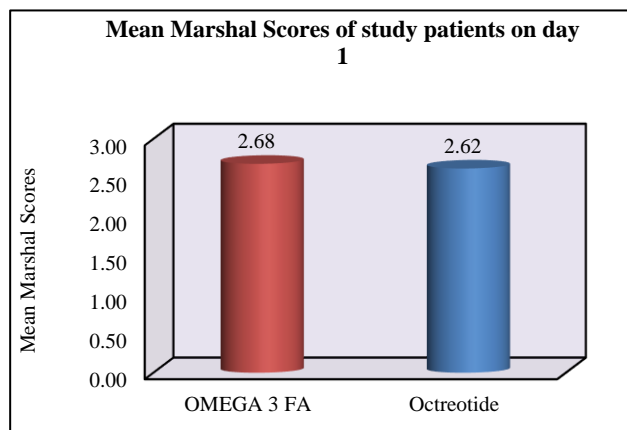


Figure 6: Modified Marshal scoring between study groups on day 1.

Mean Marshal score in omega 3 fatty acid group on admission was 2.68 and octreotide 2.62 (p=0.615, non significant). Day 5 mean Marshal score in omega 3 fatty

acid group was 1.14 and octreotide group 2.64 (p=0.0001, highly significant) (Table 4 and Figure 6).

Mean hospital stay in omega 3 fatty acid group was 3.32 days and octreotide was 5.40 days (p=0.0001, highly significant) (Figure 7).

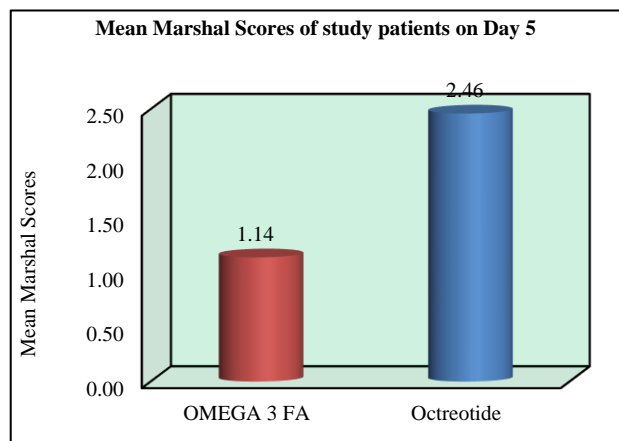


Figure 7: Modified marshal scoring between study groups on day 5.

Table 3: Comparison of mean values and p value of serum amylase, serum lipase and BISAP score between 2 study groups on day 1 and day 5.

Parameters	Groups, n=50	Mean	SD	Median	P value
Amylase	Omega 3 FA	233.86	150.87	189.00	0.03*
	Octreotide	375.02	342.35	232.50	
Lipase	Omega 3 FA	105.24	56.53	98.00	0.006*
	Octreotide	149.06	71.59	147.50	
BISAP	Omega 3 FA	1.20	0.40	1.00	0.006*
	Octreotide	1.54	0.68	1.00	

* Statistically Significant

Table 4: Comparison of mean values of modified Marshal scoring between 2 study groups on day 1 and day 5.

	Groups, n=50	Mean	SD	Median	P value
Marshal score day 1	Omega 3 FA	2.68	0.62	3.00	0.62
	Octreotide	2.62	0.57	3.00	
Marshal score day 5	Omega 3 FA	1.14	0.50	1.00	<0.001*
	Octreotide	2.46	0.56	3.00	

* Statistically Significant

DISCUSSION

As per statistical analysis the use of omega 3 fatty acid turned out to be highly significant in terms of cases of acute pancreatitis where a dramatic reduction in lipase levels was noted with a single 250ml infusion of omega 3 Fatty Acid and reduction in the overall mortality and morbidity by reduced BISAP scores. Omega 3 Fatty Acid stopped the progression of organ dysfunction and mostly reversed it which was proved by reduction in the Marshal scores. Overall omega 3 Fatty Acid infusion reduces the early conversion of cases of acute pancreatitis to severe acute pancreatitis and halts organ dysfunction, allows

early enteral nutrition thus reducing the incidence of conversion of sterile necrosis into infected one.

Our trial proves that in adverant use of antibiotics in acute pancreatitis is not justified (as proved by Dutch pancreatitis study group 2011). Omega 3 fatty Acid overall reduces the hospital stay, ICU stay, reverses SIRS and MODS thus reducing the no of DALY's. On 6 and 12 weekly follow up patients in omega 3 fatty acid group had no complaints or relapses in terms of symptomatology.

The treatment of acute pancreatitis at present is largely supportive. However, a therapeutic window for intervention with modulators of inflammation exists between the onset of clinical symptoms and peak proinflammatory cytokine expression. Polyunsaturated fatty acids (omega-3) are the precursors of the lipid mediators and play an important role in regulation of inflammation. ω -3 FA suppresses the inflammation and improves the course of infection by reducing proinflammatory eicosanoid and cytokine production. The ability of ω -3 FA to regulate these immune processes has been well described in many experimental and clinical studies

CONCLUSION

Although several meta-analyses have been conducted recently in an effort to clarify whether the administration of ω -3 FA improves outcomes in patients with AP, definitive conclusions have been lacking. Therefore, perspectives on the use of ω -3 FA treatment in critically ill patients remained conflicting. This is the first of its kind comparative analysis between octreotide which proved ineffective by multiple trials in acute pancreatitis but still remains the go to drug for many workers versus omega 3 fatty acids infusion which showed promising results in our trial. Octreotide has its own side effects and is a costly drug which needs to be given 3 times a day for 5 days. A single infusion of omega 3 fatty acid infusion reduces the overall burden on the patient and hospitalisation associated costs. As omega 3 fatty acid infusion had no side effects noted it can be safely tagged as the go to drug therapy in acute pancreatitis hypersensitivity ruled out per se. ω -3 PUFA improves the early clinical outcomes of the patients of moderate to severe AP and due consideration should be given to making IV omega- 3 PUFA supplementation part of the

standard management protocols for moderate to severe acute pancreatitis.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Moggia E, Koti R, Belgaumkar AP, Fazio F, Pereira SP, Davidson BR, Gurusamy KS. Pharmacological interventions for acute pancreatitis. Cochrane Database of Systematic Reviews. 2017;(4):12-50.
2. Lankisch PG, Banks PA. Pancreatitis. 1st ed. New York: Springer;1998.
3. Garg PK, Tondon RK. Survey on chronic pancreatitis in the Asia-Pacific region. J Gastroenterol Hepatol. 2004;19:998-1004.
4. Rudraiah HGM, Kalke SV, Desai A. A novel treatment protocol in acute pancreatitis- the first double blinded comparative trial of omega 3 fatty acid infusion versus octreotide. Int Surg J. 2018; 5:4052-7.
5. Mayer K, Meyer S, Reinholz-Muhly M, Maus U, Merfels M, Lohmeyer J, et al. Short-time infusion of fish oil based lipid emulsions, approved for parenteral nutrition, reduces monocyte proinflammatory cytokine generation and adhesive interaction with endothelium in humans. J Immunol. 2003;171:4837-43.
6. Mori TA, Beilin LJ. Omega-3 fatty acids and inflammation. Curr Atheroscler Rep. 2004;6:461-7.

Cite this article as: Narayanswamy T, Supreeth K, Sridhar G. A double blinded comparative study between omega 3 fatty acid infusion versus octreotide infusion in acute pancreatitis. Int Surg J 2020;7:3251-5.