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ROLE OF LOW MOLECULAR WEIGHT HEPRIN IN THE TREATMENT OF ACUTE PANCREATITIS

General Surgery

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ABSTRACT

Aim: To study the effect of low molecular weight heparin in the treatment of acute pancreatitis. **Methodology:** Patients presenting to emergency room of Sri Lakshmi Narayana institute of medical sciences with features of acute pancreatitis with duration of 72 hours or less. **Result:** Total number of patients in the study was 100. Most common age group affected was 30-50 years of age. Out of 100; 86were male patients and 14 were female patients. **Conclusion:** The low molecular weight heparin improves the micro circulations as a result of it relives the abdominal pain, halt the progression of the disease, reduces the severity and complication , shortens the length of hospital stay and enhances the cure rate.

KEYWORDS

Acute, pancreatitis, low molecular weight heparin.

INTRODUCTION

Acute pancreatitis is a disease which has many etiologies. Each etiology seems to affect the pancreatic acinar cell in some way that results in premature activation and retention of potent proteolytic enzymes In early stages of pancreatitis, macrophages, neutrophils, endothelial cells are activated. Preinflammatory cytokines are released and inflammation factors re elevated during acute pancreatitis and have been implicated in progression of pancreatitis associated microvascular disturbance and hemorrhagic necrosis.

Ischemia, reperfusion injury and tiny thrombosis are closely associated with pancreatic microcirculation disturbance (1). Severe acute pancreatitis [SAP] is severe and frequently a lethal disorder. Its mortality rate reaches upto 25 to 40%.(2).SAP is usually complicated with systemic inflammatory cascades and microcirculatory disturbances-related morbidity due to infected pre pancreatic necrosis.

Microcirculation disturbance is a trigger factor and plays an important role in the development of multiorgan failure(3, 4). Due to high mortality rate, search for newer modality of treatment is the hot point in the fields of pancreatic surgery. Low molecular weight heparin (LMWH) is known to posses a special anti-thrombin activity which is stronger and safer than unfrationated heparin. LMWH can reduce the release of cytokines and inflammatory mediators, resulting in an improvement of the microcirculation of pancreas. Our experimental study provides evidence that LMWH can block the initiation of an inflammatory storm, leading to improvement of microcirculation system; and has anti-thrombus effect to reduce the formation of microthrombosis in pancreas. These findings demonstrate the important therapeutic effect of LMWH in the treatment of acute Pancreatitis.

MATERIALS AND METHODS

Study Area: Sri Lakshmi Narayana Institute of Medical Sciences

Study Population: Patients admitted in the surgery department with a diagnosis of acute pancreatitis of duration of 72 hours or less.

Inclusion Criteria:

Patients diagnosed with acute pancreatitis based on the following 2 criteria:

1. Abdominal pain characteristic of acute pancreatitis (duration <72 hrs).
2. Serum amylase and/or lipase ≥ 3times the upper limit of normal.

Exclusion Criteria:

1.The presence of chronic pancreatitis and gall stone induced pancreatitis
2. Hypersensitivity to the administration of low molecular weight heparin or radiocontrast agents
3. Computed tomography (CT) findings suggestive of complicated pancreatitis
4. Pregnant or breastfeeding
5. Coagulation disturbances
6. Severe comorbidities

Study Period: September 2022-August 2023

Sample Size: 100, All the patients eligible by inclusion criteria to be included in the study.

Study Design: An observational study to be conducted on patients admitted in surgery department for the above study.

Informed consent will be taken from each.

OBSERVATION AND ANALYSIS

Age Distribution

AGE DISTRIBUTION
TABLE-1

AGE(IN YRS)	NO OF PATIENTS	PERCENTAGE
< 30	24	24%
31-40	30	30%
41-50	29	29%
> 50	17	17%

Age In Years

TABLE-2

	AGE IN YEARS	
TREATMENT	MEAN	SD
WITH HEPARIN	40	9.44
WITHOUT HEPARIN	40.04	11.92
P VALUE - 0.985		
NON SIGNIFICANT		
UNPAIRED T TEST		

AGE DISTRIBUTION AMONG GROUPS
TABLE-3

	TREATMENT	
AGE(IN YRS)	WITH HEPARIN	WITHOUT HEPARIN
< 30	11	13
31-40	14	16
41-50	16	13
> 50	9	8
P VALUE - 0.880		
NON SIGNIFICANT		
KRUSKAL WALLIS TEST		

SEX DISTRIBUTION
TABLE-4

SEX	NO OF PATIENTS	PERCENTAGE
MALE	86	86%
FEMALE	14	14%

SEX DISTRIBUTION AMONG GROUPS
TABLE-5

	TREATMENT	
SEX	WITH HEPARIN	WITHOUT HEPARIN
MALE	44	42
FEMALE	6	8
P VALUE - 0.564		

FINAL OUTCOME
TABLE-6

FINAL OUTCOME	NO OF PATIENTS	PERCENTAGE
RECOVERED	96	96%
DIED	4	4%

FINAL OUTCOME AMONG GROUPS
TABLE-7

	TREATMENT	
FINAL OUTCOME	WITH HEPARIN	WITHOUT HEPARIN
RECOVERED	50	46
DIED	0	4
P VALUE - 0.041		
SIGNIFICANT		
CHI SQUARE TEST		

DISCUSSION:

Acute pancreatitis runs a severe course in a minority of patients. However, this subset is responsible for the burden of the disease. Therefore, decreasing the burden of acute pancreatitis can only be achieved with successful management strategies towards the condition. Previous clinical and experimental data revealed that acute pancreatitis fate was dictated in the early hours of pancreatitis, and microcirculation impairment was the pivotal derangement leading to necrosis and further damage. The presence of a hematocrit value of greater than 44 % and failing to decrease it with intravenous fluid boluses was considered to predict a severe prognosis. Hemoconcentration may cause microcirculation impairment and may play an essential role in the transition of edematous to necrotizing pancreatitis. The abundance of several inflammatory cytokines in the pancreas microenvironment in the setting of acute pancreatitis is also considered as one of the precipitating events. Pro-inflammatory cytokines, such as interleukins- IL-1β, IL-6, and TNF-α increase during acute pancreatitis and are responsible for the progression of microvascular disturbance. The microcirculatory disruption is as essential as enzymatic and free radical damage in the pathogenesis of acute pancreatitis. Thrombosis, associated with denudation of endothelial cells, sludge formation, and resultant stasis, in the pancreatic circulation is an event occurring as early as mucoid swelling within the acini in the course of AP. These described changes in the pancreatic tissue usually start from the gland's peripheral part and extend toward the gland's center part. In addition to the microthrombi formation, there will be an accumulation of fibrin at the distal portion of the thrombus.

Enoxaparin is low molecular weight heparin that binds to antithrombin III and accelerates antithrombin III activity (A.T.I.I.I.). By activating antithrombin III, Enoxaparin preferentially potentiates the inhibition of coagulation factors Xa and IIa. Factor Xa is involved in catalyzing prothrombin's conversion to thrombin and prevents the formation of fibrin clot. The heparin - antithrombin III complex reduces the activity of trypsin and chymotrypsin. It inhibits trypsinogen activation, thereby preventing the progression of the disease.

CONCLUSION:

Findings From Our Study Found that use of LMWH in treatment of Acute pancreatitis, which acts by improving microcirculation is an effective drug in the non-surgical treatment of acute pancreatitis. As per our study, the APACHE II Scores reduced considerably in the group treated with LMWH, suggesting that there was a considerable improvement in laboratory values, higher cure rate and lower complication. Such as Necrosis, Abscess, sepsis and Organ failure etc.Thus LMWH can effectively relieve acute pancreatitis related inflammation and reduce incidence of complications. LMWH can rapidly relieve abdominal pain, halt the progression of diseases, reduce the severity and complication, shorten the length of hospital stay and enhance the cure rate.

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