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RESEARCH ARTICLE

“EFFECTIVENESS OF TOKYOGUIDELINES 2018 IN THE MANAGEMENT OF ACUTE CHOLANGITIS AND ACUTE CHOLECYSTITIS”

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Abstract

Acute biliary sepsis which includes Acute cholecystitis and Acute Cholangitis are life threatening surgical emergencies which needs early recognition and prompt institution of appropriate management strategies. Except for some well-known clinical signs like Murphy's sign and Charcot's triad there are no well-defined criteria for the diagnosis of above said biliary infections. Tokyo Guidelines 2018 is expert panel formulated Diagnostic and severity assessment criteria guidelines is the only guidelines available till date which aids in the diagnosis and management of the same. More number of patients can be diagnosed at an early stage of infection and appropriate treatment instituted at the earliest by using this guidelines, thus avoiding any foreseen complications. In this study, we have assessed the feasibility of using TG 18 guidelines in diagnosing and managing acute biliary infections in ESI Medical College and Hospital Rajajinagar, Bengaluru. **Objective:** To study the effectiveness of Tokyo Guidelines 2018 in diagnosing, assessing severity and management of acute cholecystitis and acute cholangitis.

Material and Methods: All cases of acute cholangitis and acute cholecystitis admitted in ESI Medical College and Hospital Rajajinagar, Bengaluru. Patients who had been diagnosed as a case of acute Cholecystitis and acute cholangitis were followed up and assessed using the TG 18 guidelines criteria and the outcomes were analysed. The efficacy of Using the guidelines in our setup and reproducibility of guideline demanding parameters were analysed that were appropriate in our setup. Clinical details and lab and imaging findings were recorded using a well detailed clinical proforma that included detailed description of analysis of a case of acute cholecystitis and cholangitis. Also other contributing factors, clinical patterns, presentation, treatment outcomes were analysed in detail.

Results: Acute Cholecystitis with most common etiology being gallstone disease is more common in females (66.6%), While Acute

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cholangitis is more common among elderly females(60%). 56.7 % patients diagnosed with Acute cholecystitis and 46.7% patients diagnosed with acute cholangitis presented to us in 24 - 72 hours of symptom onset. 33.3 % of cholecystitis and > 50% cholangitis patients were Diabetics Under treatment for the same.

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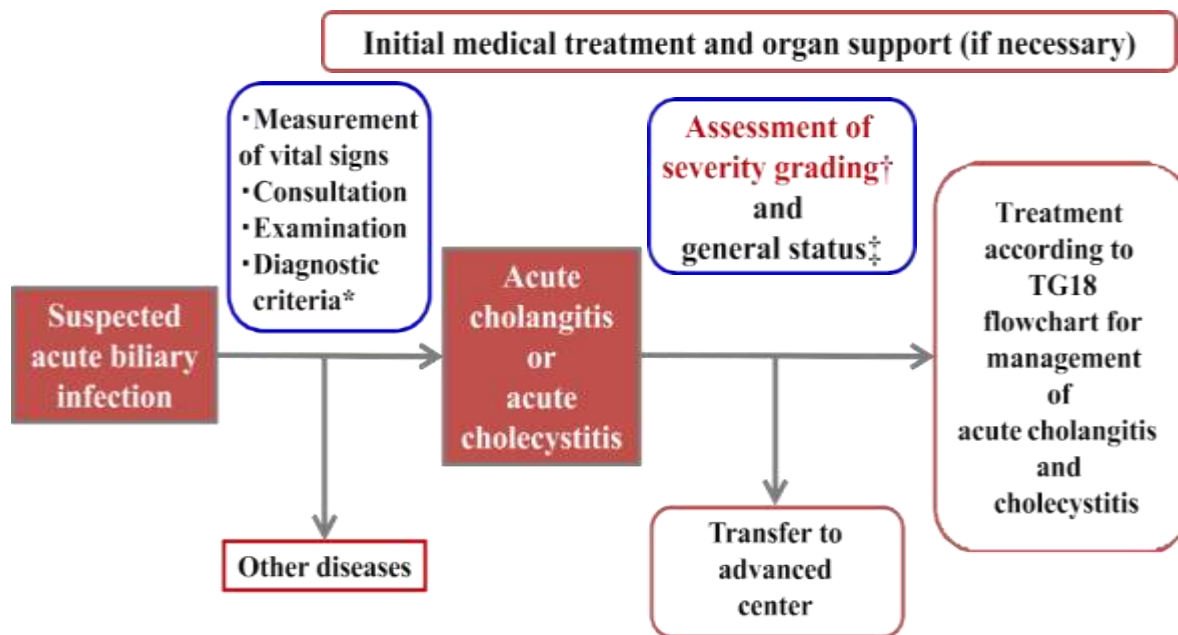
Introduction:-

Acute cholangitis and Acute cholecystitis require appropriate treatment in the acute phase. Severe acute cholangitis may result in early Mortality and Morbidity if appropriate medical care is Delayed in the acute phase. Before the publication of the Tokyo Guidelines for the management of acute cholangitis and cholecystitis (TG07) in January 2007 ,which consequently was updated in 2013 and 2018 there were no practical guidelines throughout the world primarily targeting the treatment of acute cholangitis and cholecystitis. TG18 Diagnostic Criteria of Acute Cholangitis and Cholecystitis are criteria to establish the diagnosis when cholestasis and inflammation based on clinical signs or blood tests in addition to biliary manifestations based on imaging are present. TG18 guidelines also encompasses a severity assessment criteria based on which patients can be divided into groups which are then managed accordingly as per the severity criteria. It allows for early diagnosis and easy management of patients and to determine the necessity for early biliary drainage in case of cholangitis and early cholecystectomy in case of cholecystitis which are vital life saving measures in view of these dreaded biliary tract infections.

In 2003, The Japanese society of hepato-pancreatic biliary surgery formed working group to formulate guidelines to diagnose and manage the acute biliary sepsis. As a result of which Tokyo guidelines 2007 was formulated dictating diagnostic criteria and severity assessment criteria for protocol based management of acute cholecystitis and acute cholangitis. There were few flaws and drawbacks in 2007 format, hence it was reworked upon and updated Tokyo guidelines was formulated in the year 2013. These guidelines are currently followed as Tokyo Guidelines 2018. This Tokyo guidelines 2018 is the currently available only guidelines universally in the management of above said biliary infections.

The guidelines not only aids in the diagnosis of Acute cholecystitis and Acute cholangitis but also offers a platform to assess the severity of the disease with which the patient presents to medical attention and guide appropriate treatment.

TG18 flowchart for the initial response to acute biliary infection¹.



TG 18 DIAGNOSTIC CRITERIA FOR ACUTE CHOLECYSTITIS

- A LOCAL SIGNS OF INFLAMMATION:
 - A-1 Murphy's sign
 - A-2 Right upper quadrant pain/mass/tenderness
- B SYSTEMIC SIGNS OF INFLAMMATION:
 - B-1 Fever
 - B-2 Elevated CRP
 - B-3 Elevated WBC counts
- C IMAGING:
 - C-1 Thickening of Gallbladder > 5mm
 - C-2 Enlarged Gallbladder
 - C-3 Debris Echo
 - C-4 Ultrasonographic Murphy's Sign
 - C-5 Gas imaging
 - C-6 Pericholecystic fluid

SUSPECTED DIAGNOSIS: One item in A + One item in B
DEFINITE DIAGNOSIS: One item in A + One item in B+C

SEVERITY ASSESSMENT CRITERIA FOR ACUTE CHOLECYSTITIS:**GRADE III : Acute Cholecystitis + Any of following organ dysfunction :**

1. CVS Dysfunction:
Hypotension requiring treatment with dopamine $\geq 5 \mu\text{g}/\text{kg}/\text{min}$ or any dose of Noradrenaline
2. Neurological Dysfunction:
Decreased level of consciousness
3. Renal Dysfunction:
Oliguria/ creatinine > 2 mg/dl
4. Respiratory Dysfunction:
PaO₂/FiO₂ ratio < 300
5. Hepatic dysfunction
PT-INR > 1.5
6. Hematological Dysfunction:
Platelet count < 1,00,000/mm³

Grade II: Presence of any of the following:

1. Elevated WBC count > 18,000/mm³
2. Palpable tender mass in Right upper Quadrant
3. Duration of symptoms > 72 hours
4. Marked local inflammation (gangrenous or emphysematous cholecystitis/pericholecystic or hepatic abscess/biliary peritonitis)

GRADE I: Does not meet the criteria of GRADE III/GRADE II.**TG 18 CRITERIA FOR DIAGNOSING ACUTE CHOLANGITIS**

- A SYSTEMIC INFLAMMATION:
 - A-1 Fever and /or shaking chills
 - A-2 WBC Count < 4000 / >10000 cells/mm³ or CRP $\geq 1 \text{ mg}/\text{dl}$
- B CHOLESTASIS
 - B-1 Jaundice (T.Bilirubin > 2mg/dl)
 - B-2 Abnormal Liver function tests
- C IMAGING:
 - C-1 Biliary dilatation
 - C-2 Evidence of etiology on imaging (stricture/stone/stent)

SUSPECTED DIAGNOSIS: One item in A + One item in B
DEFINITE DIAGNOSIS: One item in A + One item in B + One Item in C

SEVERITY ASSESSMENT CRITERIA FOR ACUTE CHOLANGITIS:**Grade III :Acute Cholangitis + Any of following organ dysfunction :**

- 1 CVS Dysfunction:
Hypotension requiring treatment with dopamine $\geq 5 \mu\text{g}/\text{kg}/\text{min}$ or any dose of Noradrenaline
- 2 Neurological Dysfunction:
Decreased level of consciousness
- 3 Renal Dysfunction:
Oliguria/ creatinine $> 2 \text{ mg}/\text{dl}$
- 4 Respiratory Dysfunction:
PaO₂/FiO₂ ratio < 300
- 5 Hepatic dysfunction
PT-INR > 1.5
- 6 Hematological Dysfunction:
Platelet count $< 1,00,000/\text{mm}^3$

Grade II: Presence of any of the following:

- 1 Elevated WBC count $> 12,000/\text{mm}^3$ & $< 4000 \text{ cells}/\text{mm}^3$
- 2 High fever (> 39 degree centigrade)
- 3 Age $> / = 75$ years
- 4 Hyperbilirubinemia (T.bilirubin $> 5 \text{ mg}/\text{dl}$)
- 5 Hypoalbuminemia ($< \text{Max upper limit value} \times 0.7$)

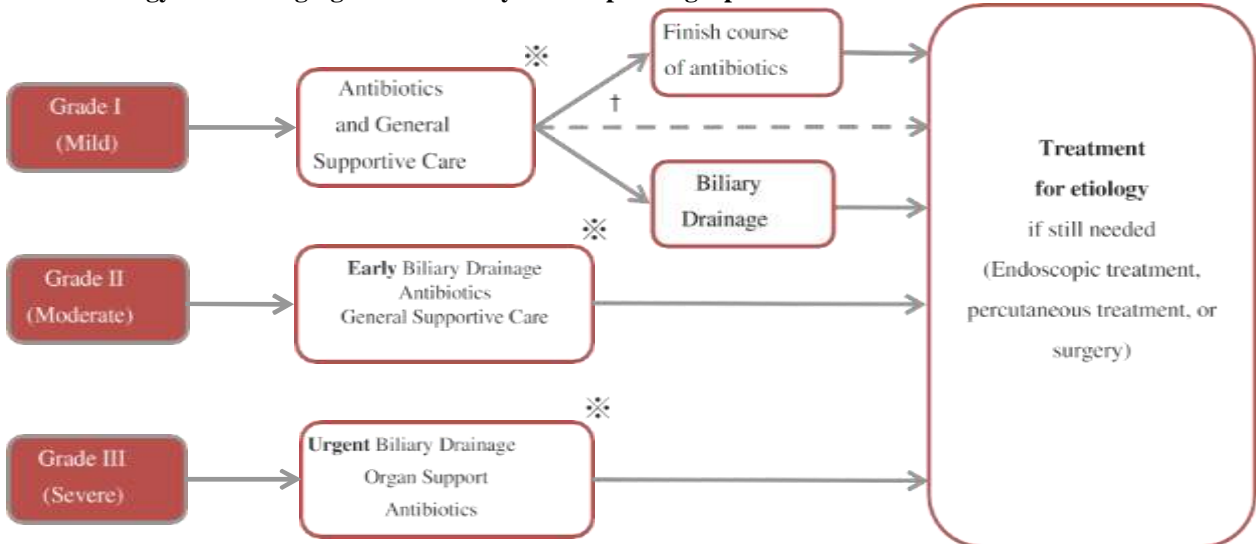
GRADE I: Does not meet the criteria of GRADE III/GRADE II at Initial diagnosis**Management Of Cholecystitis According to TG 18 Guidelines:**

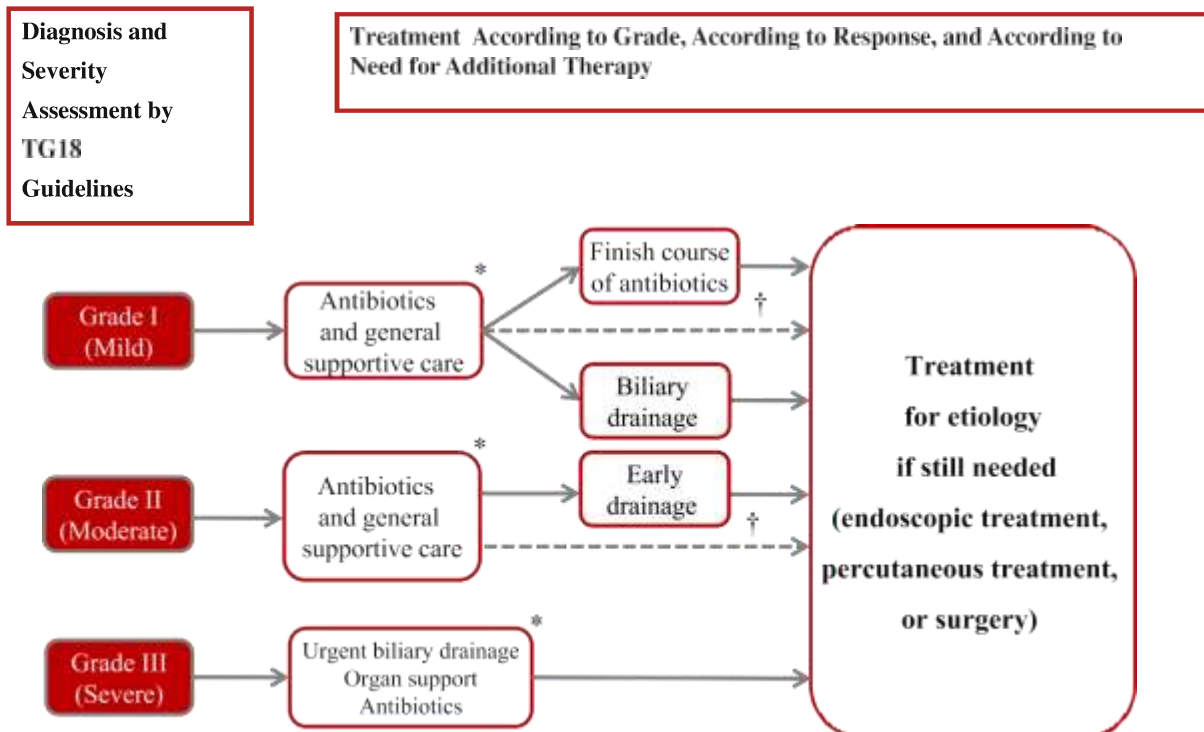
Grade I (Mild) acute cholecystitis: Early laparoscopic cholecystectomy is the preferred procedure.

Grade II (Moderate) acute cholecystitis: Early cholecystectomy is recommended in experienced centers. However, if patients have severe local inflammation, early gallbladder drainage (percutaneous or surgical) is indicated. Because early cholecystectomy may be difficult, medical treatment and delayed cholecystectomy are necessary.

Grade III (Severe) acute cholecystitis:

Urgent management of organ dysfunction and management of severe local inflammation by gallbladder drainage should be carried out. Delayed elective cholecystectomy should be performed when cholecystectomy is indicated.

Guideline Strategy For Managing Acute Cholecystitis Depending Upon The Grade Of The Disease:

Guideline Strategy For Managing Acute Cholangitis Depending Upon The Grade Of The Disease:**Material and Methods:-****Source of data:**

All cases of acute cholangitis and acute cholecystitis admitted in ESI Medical College and Hospital Rajajinagar, Bengaluru. Patients who had been diagnosed as a case of acute Cholecystitis and acute cholangitis were followed up and assessed using the TG 18 guidelines criteria and the outcomes were analysed. The efficacy of Using the guidelines in our setup and reproducibility of guideline demanding parameters were analysed that were appropriate in our setup.

Clinical details and lab and imaging findings were recorded using a well detailed clinical proforma that included detailed description of analysis of a case of acute cholecystitis and cholangitis. Also other contributing factors, clinical patterns, presentation, treatment outcomes were analysed in detail. Data analysis and master charting was done using Microsoft Excel software And the results interpreted.

Inclusion criteria :

All the patients aged 18 to 60 years who were diagnosed Acute Cholecystitis and acute cholangitis using Tokyo Guidelines 18 were included in this study.

Exclusion criteria :

1. Cases of acute cholangitis and acute cholecystitis due to extrabiliary pathology
2. Patients denying treatment/admission
3. Patients not giving consent

Duration of the study:

January 2019 to June 2020

Type of study:

Prospective Study.

Study sample :

60 CASES, 30 cases in each group.

Sample Size Calculation

Acute biliary infection, particularly acute cholangitis, and acute cholecystitis may cause a rapid deterioration in condition due to sepsis, and prompt and appropriate treatment is therefore required. . TG18 diagnostic criteria and severity grading has adopted for the effectiveness of management of the both the conditions. On the basis of previous literature the sensitivity of the TG1 is 91%. Using G* power for sample size calculation. Relative precision of +/- 5%.CI =95% and the attrition of 5%,the sample size calculated was 60.

Calculated sample size is 60, which is 30 for each group.

Statistical Analysis:

The data will be analyzed using Statistical Package for Social Science (SPSS). Descriptive statistics with frequency, percentage, mean and standard deviation will be taken. p-value will be taken as significant when <0.05. Chi Square Test will be used to assess the statistical significant difference. Any other suitable statistical methods will be used at the time of data analysis.

Results:-

This study included total of 60 patients – 30 patients diagnosed with acute Cholecystitis and 30 patients diagnosed with acute cholangitis.

Acute Cholecystitis:

Acute cholecystitis had a higher incidence in females(66.6 %) in our study group 20 females and 10 males with no statistical significant difference. P-value 0.09.

Incidence of acute cholecystitis is higher in elderly patients above 50 years of age.

Table 1:- Durations of symptoms in patients with acute cholecystitis.

Age (years)	ACUTE CHOLECYSTITIS		Chi square	p-value
<40	7	23.30%	0.889	0.077
40-50	9	30.00%		
>50	14	46.70%		

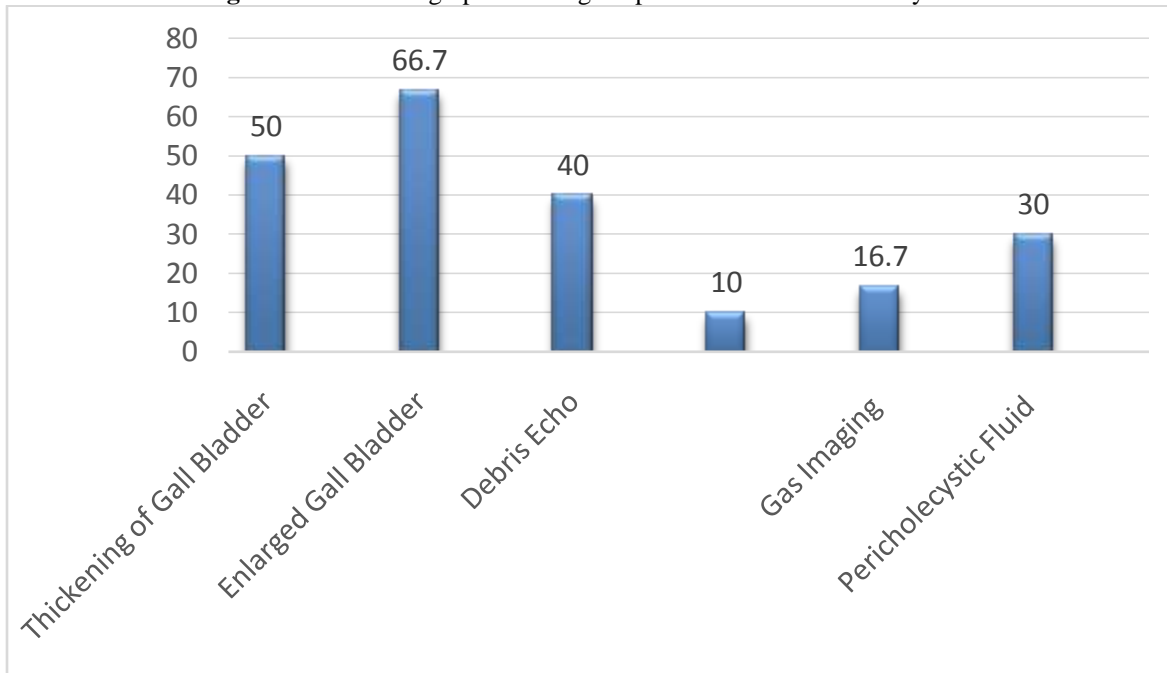
56 % of the patients presented to medical attention after 24 - 72 hours. More than 40% of patients presented after 72 hrs. Mean duration being 34.9±10.5 hrs.

Pain abdomen(86.7%) and Fever(80%) are predominant complaint followed by chills, vomiting, jaundice.

Table 2:- Symptoms and signs in the study population with acute cholecystitis.

SYMPTOMS	ACUTE CHOLECYSTITIS		Chi square	p-value
Fever	24	80.0%	1.774	0.338
Pain	26	86.7%		
Vomiting	08	26.7%		
Chills & Rigors	13	43.3%		
Abdominal tenderness	18	60.0%		
Jaundice	09	30%		
Anorexia	19	63.3%		
Murphy's sign	20	65%		

Enlarged Gallbladder wall (66.7 %) was the most consistent Finding In ultrasonogram of the study population. Thickening of Gall bladder was the second most common finding that is attributed to Acute cholecystitis.

Figure 1:- Ultrasonographic findings in patients with acute cholecystitis.

More than 70 % of the study population had an elevated total Leucocyte count of more than 12000 cells/mm³. More than 80 % of the study population had serum amylase level Above 100 IU/L. More than 60 % of the study group had an elevated total Cholesterol level of more than 150 mg/dl.

Table 3:-Laboratory investigations in patients with acute cholecystitis.

LAB INVESTIGATION		ACUTE CHOLECYSTITIS
TOTAL LEUCOCYTE COUNT	>12000	21 (70.0)
	<12000	09 (30.0)
	Median	14600
CRP	Mean	110mg/l
Mean Haemoglobin (gm %)	Mean	10.9±2.8
Serum Bilirubin (mg %)	Median	6.4 (0.7-22.5)
Serum Amylase(U/L)	<100	26
	>100	4
Total cholesterol (mg/dl)	<140	1
	140 - 200	15
	>200	14
Serum Albumin (gm %)		
SGOT(U/L)		81.8±27.9
SGPT(U/L)		78.6±18.3

33.3 % of our study group are diabetics , 33 % of the study population are hypertensives, 26.7% population with dyslipidaemia.

In most patients with Gallstones as detected etiology Multiple GB stones was more common .In patients with single Gallstone the predominant site was neck of gallbladder.

Grade 2 Cholecystitis was the most common Grade of disease of most patients in our study group. More than 50% of study population Had grade 2 disease at the time of presentation.

Table 4:- Severity grading of the disease in patients with acute cholecystitis.

GRADE	ACUTE CHOLECYSTITIS	
GRADE I	13	43%
GRADE II	16	53%
GRADE III	1	3%

Out of 13 patients in grade 1 acute cholecystitis, The 4 patients undergone immediate surgery < 72 hours and 9 patients undergone delayed surgery after 72 hours. The surgery is done within 72 hours for four patients, 72 – 96 hours for two patients and more than 96 hours for seven patients. Laparoscopic cholecystectomy is done for 10 patients, converted to open in 3 patients. Out of 16 patients in grade 2 acute cholecystitis, The 4 patients undergone immediate surgery < 72 hours and 12 patients undergone delayed surgery after 72 hours. The surgery is done within 72 hours for four patients, 72 – 96 hours for three patients and more than 96 hours for nine patients. Laparoscopic cholecystectomy is done for 11 patients, converted to open in 4 patients. Open cholecystectomy in one patient. One patient in grade three acute cholecystitis underwent delayed laparoscopic cholecystectomy after > 96 hours.

Table 5:- Management outcomes in patient with acute cholecystitis.

ACUTE CHOLECYSTITIS			
	Grade I N=13	Grade II N=16	Grade III N=1
Surgery			
Immediate	4	4	-
Delayed	9	12	1
Timing of Surgery			
<72 hrs	4	4	-
72-96 hrs	2	3	-
>96hrs	7	9	1
Type of Surgery			
Laparoscopic	10	11	1
Lap converted open	3	4	-
Open cholecystectomy	-	1	-

Among grade one patients two patients had inflamed gallbladder as intraoperative findings and four patients had frozen calot. In grade two – three patients had inflamed gall bladder, one had frozen calot, one had gangrenous cholecystitis, two patients had gall bladder emphyema. One patient out of 30 patients had postoperative wound infection.

Acute cholangitis:

Out of thirty patients, Acute cholangitis had a higher incidence in females(60 %) in our study group with female being 18 and males being 12 with no statistical significant difference. p- value 0.08.

More than 50 % of the study population in the Acute Cholangitis group were > 50 years of age.

Table 6:- Age wise incidence of acute cholangitis.

Age (years)	ACUTE CHOLANGITIS		Chi square	p-value
<40	6	20.00%	0.889	0.077
40-50	8	26.70%		
>50	16	53.30%		

Fever (93.3%) is the predominant symptom followed by abdominal pain (76.7%), vomiting, chills and rigors. Abdominal tenderness is the predominant sign seen in all patients. Charcot's triad is seen in 90% of the study population. 89 % patients in my study group had the characteristic Charcot's triad in AcuteCholangitis.

Table 7:-Symptoms and signs in patients with acute cholangitis.

SYMPTOMS	ACUTE CHOLANGITIS		Chi square	p-value
Fever	28	93.3%	1.774	0.338
Pain	23	76.7%		
Vomiting	11	36.7%		
Chills & Rigors	9	30.0%		

Tenderness	30	100%	
Charcot's triad	27	90.0%	
Jaundice	27	90.0%	
Anorexia	17	56.7%	

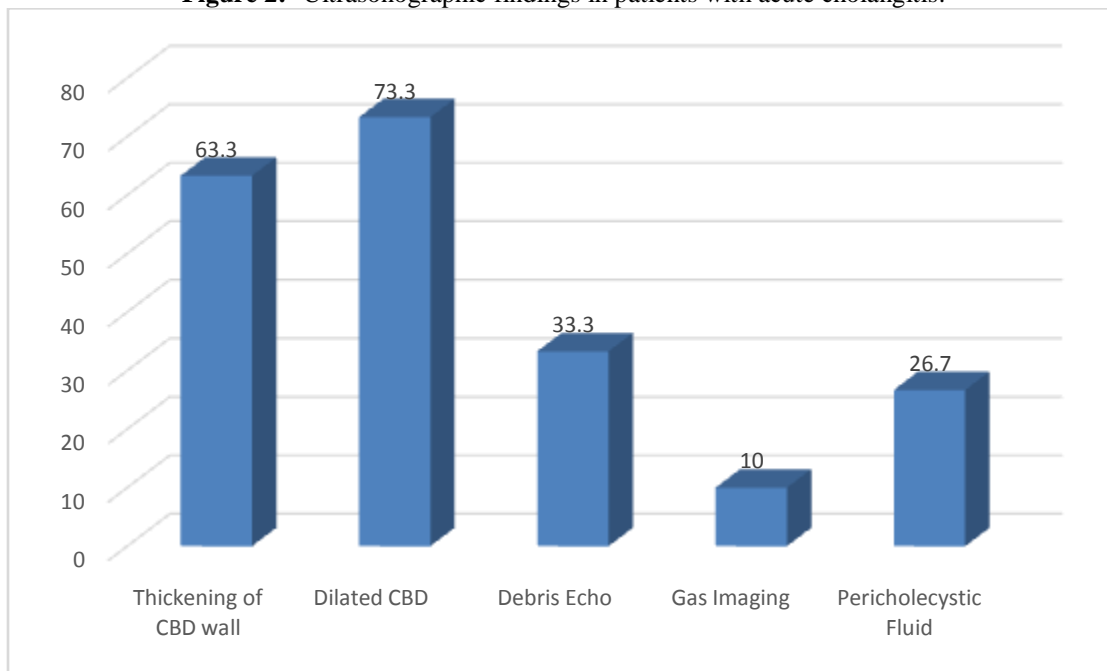
46.7 % of the patients presented to medical attention after 24 - 72 hours. More than 46.7% of patients presented after 72 hrs with significant p-value of 0.0031.

Table 8:- Duration of symptoms in patients with acute cholangitis.

Duration of Symptoms	ACUTE CHOLANGITIS		Chi square	p-value
<24 hours	2	6.7%	11.66	0.0031
24-72	14	46.7%		
>72	14	46.7%		
Mean duration (hours)	38.14±11.5			

Dilated CBD is the predominant ultrasound finding followed by thickened CBD wall.

Figure 2:- Ultrasonographic findings in patients with acute cholangitis.



More than 80 % of the study population had an elevated total Leucocyte count of more than 12000 cells/mm3. More than 60 % of the study group had an elevated total Cholesterol level of more than 150 mg/dl.

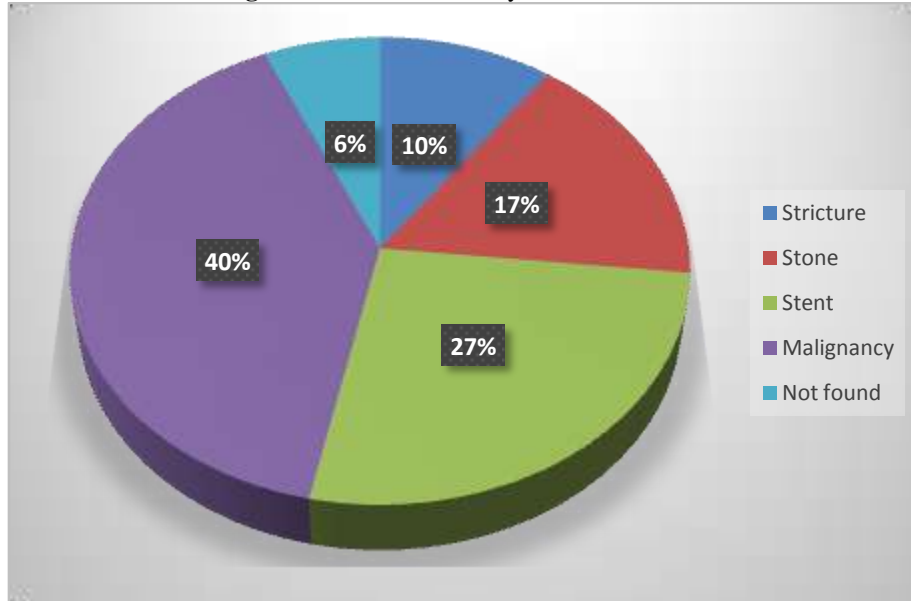
Table 9:- Laboratory investigations in patients with acute cholangitis.

Medical History		ACUTE CHOLANGITIS
TOTAL LEUCOCYTE COUNT	>12000	25 (83.3)
	<12000	05 (16.6)
	Median	14800
Mean Haemoglobin (gm %)	Mean	11.2±3.1
Serum Bilirubin (mg %)	Median	7.1 (0.4-33.6)
Serum Amylase	<40	23
	>40	07
Total cholesterol (mg/dl)	<140	2
	141-200	19
	>200	09
		3.2±0.7
Serum Albumin (gm %)		

SGOT(U/L)		87.5± 24.3
SGPT(U/L)		80.1±14.6

Malignancy is the most common cause in 40% of the study population, followed by CBD stent in 27%, CBD stone in 17%, CBD stricture in 10% and cause of cholangitis could not be found in about 6% of the study population.

Figure 3:- Cause for biliary tract obstruction.



Grade 2 Cholangitis was the most common Grade of disease of most patients in our study group. More than 50% of study population had grade 2 disease at the time of presentation followed by grade 1 cholangitis.

Table 10:- Grading of the disease.

GRADE	ACUTE CHOLANGITIS	
GRADE I	14	46.60%
GRADE II	16	53.30%
GRADE III	0	0%

In patients with grade 1 acute cholangitis, Biliary drainage is done in 8 patients out of 14 patients and managed conservatively in 6 patients. Surgical biliary drainage is done in 6 patients, followed by endoscopic drainage in 1 patients and percutaneous drainage done in 1 patient. 2 patients underwent surgical procedure within 24 hours of clinical presentation. In patients with grade 2 acute cholangitis, Biliary drainage is done in 12 patients out of 16 patients and managed conservatively in 4 patients. Surgical biliary drainage is done in 10 patients, followed by endoscopic drainage in 2 patients. 6 patients underwent 72 hours of presentation, 3 patients after 24-72 hours and 3 patients within 24 hours of presentation.

Table 11:- Management outcomes in patient with acute cholangitis.

	Grade I N(%)=14	Grade II N(%)=16
Biliary drainage		
Not done	6	4
Done	8	12
Timing of Surgery		
<24 hrs	2	3
>24-72 hrs	3	3
>72 hrs	3	6
Type of Surgery		
Percutaneous Drainage	1	0
Endoscopic	1	2

Surgical	6	10
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Discussion:-

Acute Biliary sepsis is more common in elderly patients aged more than 50 years of age. Acute Cholecystitis with most common etiology being gallstone disease is more common in females (66.6%), While Acute cholangitis is more common among elderly females (60%).

Gallstones being the most common etiology. As discussed in review of literature, gall stone diseases are more common in females. Our study group also reflected the same, most of the patients were women (66.6%) and most of the patients fell in the middle age group i.e., between 5th and 6th decade (46% of the patients). Similar observations were made by studies done by Sandhu G et al who also had majority patients being women and in the middle age group with the mean age being 44.3 years. A study done by Randhawa et al also had a similar observation where majority of the patients were women and the mean age was observed to be in the 5th and 6th decade.

The updated Tokyo Guidelines (TG2018) introduce a new standard for the diagnosis and severity assessment of acute cholecystitis. In the TG2018 diagnostic criteria, a “suspected” diagnosis is achieved when one item from section A and one item from section B are present. A “definite” diagnosis is achieved when imaging findings characteristic of acute cholecystitis (Item C) are also present. Compared with TG07, the validity of the diagnostic criteria has been improved and the severity assessment criteria of TG07 have been adopted with minor changes from TG07. While Acute Cholangitis is most commonly caused by malignant growth causing obstruction to the biliary tract.

More than 40% of patients diagnosed with acute cholecystitis presented after 72 hours of symptom onset, invariably these patients were categorized as Grade 2 as per TG 18 guidelines. 56 % of the patients presented to medical attention after 24 - 72 hours.

Acute onset upper abdominal pain was the most common symptom in the study group and tenderness over the right hypochondrium was the most common clinical sign elicited among the study group.

33% of cholecystitis and > 40% cholangitis patients were Diabetics Under treatment for the same. Nearly 50 % of the patients in cholecystitis group were afebrile at the time of presentation.

Our study group showed presence of Murphy’s sign in 65% of patients. A study conducted by Yokoe M et al showed the diagnostic accuracy was significantly higher when the Tokyo Guidelines were used than when Murphy’s sign was used.

> 70 % of the study population in cholecystitis group had an elevated leucocyte count of more than 12000 cells/mm³

More than 66 % of the cholecystitis group had an enlarged gallbladder followed by 50 % of patients with thickened gallbladder wall of size more than 5 mm in the initial screening ultrasound which was the most consistent finding followed by an enlarged gallbladder.

40 % of patients with cholecystitis and 56.7 % of patients with cholangitis were Grade 2 diseased as per TG 18 severity assessment criteria.

Our study group showed 43% grade 1 cholecystitis, 53% grade 2 and 3% grade 3. Similar observations were made in the study conducted by Takada T et al showing 45.8% of the cases were classified as Grade I, 48.9% as Grade II, and 5.3 % as Grade III.

9 patients out of 13 patients i.e., 69 % of Grade 1 cholecystitis patients were managed conservatively and 75% of Grade 2 cholecystitis patients were managed conservatively as the first Modality in the study group.

8 out of 14 patients in grade 1 acute cholangitis underwent biliary drainage, surgical drainage being more common – done in 6 patients. 12 out of 16 patients in grade 2 acute cholangitis underwent biliary drainage again surgical drainage being more common – done in 10 patients. 4 out of 16 patients of grade 2 cholecystitis who were managed

with early surgery were proceeded with laparoscopic cholecystectomy which eventually got converted to open cholecystectomy in due course due to intraoperativedifficulty.

All 4 patients in the early surgical group in grade 2 cholecystitis group had their surgery within 72 hours of symptom onset.

Post-operative complications were minimal in the operated cholecystitis group with wound infection occurring in one patient

Conclusion:-

Elderly patients in the 5th decade with are at high risk for acute biliary sepsis. Routine screening for contributing factors of the disease for these patients may be considered.

Early laparoscopic cholecystectomy can be considered within 72 hours,if patient is young and without any co-morbid illness.

Tokyo guidelines 2018 is an effective tool as multiple parameters taken into consideration under these guidelines for early diagnosis of acute cholecystitis and acute cholangitis, assessing severity of the disease and in their management outcomes.

TOKYO GUIDELINES 2018 is an appropriate tool that can be used in our setup without any fallbacks as most of parameters in the guidelines can be analysed and reproduced in our population group. It allows for early diagnosis and easy management of patients and to determine the necessity for early cholecystectomy in case of cholecystitis.

As there are limited studies, there is a need for more studies to analyse these guidelines to assess their effectiveness in the management of acute cholecystitis and acute cholangitis. A Large multicentre analytical study may be needed to analyse the guideline demanding parameters and other factors that can be added positively as recommendations to the guidelines formulating committee.

Acute biliary infection, particularly acute cholangitis, may cause a rapid deterioration in condition due to sepsis, and therefore prompt use of these guidelines and appropriate treatment can reduce morbidity and mortality in such patients.

Summary

A total of 60 cases- 30 cases of acute cholecystitis and 30 cases of acute cholangitis were studied in the present clinical study done at ESI Medical college and Post Graduate Institute of Medical Science and Research, Bengaluru during a period of one and half years from January 2019 to June 2020.

Acute Biliary sepsis is more common in elderly patients aged more than 50 years of age. Acute Cholecystitis with most common etiology being gallstone disease is more common in females (65%),While Acute cholangitis is more common among elderlyfemales.(60%)

The updated Tokyo Guidelines (TG2018) introduce a new standard for the diagnosis and severity assessment of acute cholecystitis and acute cholangitis. This is followed by appropriate treatment as per the guidelines.

There are 30 patients diagnosed with acute cholecystitis using TG18 guidelines and among them 13 patients are grade 1, 16 patients are grade 2 and 1 patient is grade 3 acute cholecystitis. Among 13 grade 1 patients, 4 patients underwent laparoscopic cholecystectomy and in 3 patients laparoscopic surgery got converted to open surgery due to intraoperative difficulties. Among 16 grade 2 patients, 11 patients underwent laparoscopic cholecystectomy, one patient underwent open cholecystectomy and in 4 patients laparoscopic surgery got converted to open surgery due to intraoperative difficulties.

There are 30 patients diagnosed with acute cholangitis using TG18 guidelines and among them 14 patients are grade 1 and 16 patients are grade 2 acute cholangitis. In grade 1 acute cholangitis patients 6 patients are managed conservatively and biliary drainage is done in 8 patients - 1 patient percutaneous drainage, 1 patient endoscopic drainage and 6 patients by surgical drainage. In grade 2 acute cholangitis patients 4 patients are managed

conservatively and biliary drainage is done in 12 patients – 2 patients endoscopic drainage and 10 patients by surgical drainage.

Except for some known clinical signs like Murphy's sign and Charcot's triad there are no well-defined criteria for the diagnosis of biliary infections. Hence Tokyo guidelines 2018 are helpful in early diagnosis, severity grading and early treatment of acute biliary infections. Hence reducing morbidity and mortality among patients.

References:-

1. Miura F, Takada T, Kawarada Y, Nimura Y, Wada K, Hirota M et al. Flowcharts for the diagnosis and treatment of acute cholangitis and cholecystitis: Tokyo
2. et al. TG13 diagnostic criteria and severity grading of acute cholecystitis (with videos). *J Hepatobiliary Pancreat Sci.* 2013;20:35–46.
3. Hirota M, Takada T, Kawarada Y, Nimura Y, Miura F, Hirata K, et al. Diagnostic criteria and severity assessment of acute cholecystitis: Tokyo Guidelines. *J Hepatobiliary Pancreat Surg.* 2007;14:78–82.
4. Guidelines. *Journal of Hepato-Biliary-Pancreatic Surgery.* 2007;14(1):27-34.
5. Takada T, Strasberg S, Solomkin J, Pitt H, Gomi H, Yoshida M et al. TG13: Updated Tokyo Guidelines for the management of acute cholangitis and cholecystitis. *Journal of Hepato-Biliary-Pancreatic Sciences.* 2013;20(1):1-7.
6. Okamoto K, Suzuki K, Takada T, Strasberg S, Asbun H, Endo I et al. Tokyo Guidelines 2018: flowchart for the management of acute cholecystitis. *Journal of Hepato-Biliary-Pancreatic Sciences.* 2017;25(1):55-72.
7. Kiriya S, Takada T, Strasberg S, Solomkin J, Mayumi T, Pitt H et al. New diagnostic criteria and severity assessment of acute cholangitis in revised Tokyo guidelines. *Journal of Hepato-Biliary-Pancreatic Sciences.* 2012;19(5):548-556
8. Yokoe M, Takada T, Strasberg S, Solomkin J, Mayumi T, Gomi H et al. New diagnostic criteria and severity assessment of acute cholecystitis in revised Tokyo guidelines. *Journal of Hepato-Biliary-Pancreatic Sciences.* 2012;19(5):578-585
9. Kiriya S, Takada T, Strasberg S, Solomkin J, Mayumi T, Pitt H et al. TG13 guidelines for diagnosis and severity grading of acute cholangitis (with videos). *Journal of Hepato-Biliary-Pancreatic Sciences.* 2013;20(1):24-34.
10. Yokoe M, Takada T, Strasberg SM, Solomkin JS, Mayumi T, Gomi H,
11. Shekelle PG, Ortiz E, Rhodes S, Morton SC, Eccles MP, Grimshaw JM, et al. Validity of the Agency for Healthcare Research and Quality clinical practice guidelines: how quickly do guidelines become outdated? *JAMA.* 2001;26:1461–7.
12. Yokoe M, Takada T, Mayumi T, Yoshida M, Hasegawa H, Norimizu S, et al. Accuracy of the Tokyo Guidelines for the diagnosis of acute cholangitis and cholecystitis taking into consideration the clinical practice pattern in Japan. *J Hepatobiliary Pancreat Sci.* 2011;18:250–7.
13. Yokoe M, Takada T, Strasberg SM, Solomkin JS, Mayumi T, Gomi H, et al. New diagnostic criteria and severity assessment of acute cholecystitis in revised Tokyo guidelines. *J Hepatobiliary Pancreat Sci.* 2012;19:578–85.
14. SADLER T W. DIGESTIVE SYSTEM, LIVER AND GALL BLADDER DEVELOPMENT. LANGMAN'S MEDICAL EMBRYOLOGY. PHILADELPHIA. LIPPINCOTT WILLIAMS & WILKINS; 2012;12:217-219
15. Courtney M, Townsend Jr, R Daniel Beauchamp, B Mark Evers, Kenneth L Mattox, Biliary tract. *Sabiston text book of surgery.* 17th Edn. Philadelphia: Elsevier Publication; 2005.p.1597-1643.
16. Bailey and love's Short practice of surgery 27th edition.
17. Lawrence H Bannister. Bile duct and gallbladder. *Gray's anatomy.* Lawrence H Bannister, Martin Berry. Dramatic publishing; 2000;38:1809-1812.