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Preface

We would like to present, with great pleasure, the inaugural volume-7, Issue-10, October 2021, of a scholarly journal, *International Multispecialty Journal of Health*. This journal is part of the AD Publications series *in the field of Medical, Health and Pharmaceutical Research Development*, and is devoted to the gamut of Medical, Health and Pharmaceutical issues, from theoretical aspects to application-dependent studies and the validation of emerging technologies.

This journal was envisioned and founded to represent the growing needs of Medical, Health and Pharmaceutical as an emerging and increasingly vital field, now widely recognized as an integral part of scientific and technical statistics investigations. Its mission is to become a voice of the Medical, Health and Pharmaceutical community, addressing researchers and practitioners in below areas

Clinical Specialty and Super-specialty Medical Science:

It includes articles related to General Medicine, General Surgery, Gynecology & Obstetrics, Pediatrics, Anesthesia, Ophthalmology, Orthopedics, Otorhinolaryngology (ENT), Physical Medicine & Rehabilitation, Dermatology & Venereology, Psychiatry, Radio Diagnosis, Cardiology Medicine, Cardiothoracic Surgery, Neurology Medicine, Neurosurgery, Pediatric Surgery, Plastic Surgery, Gastroenterology, Gastrointestinal Surgery, Pulmonary Medicine, Immunology & Immunogenetics, Transfusion Medicine (Blood Bank), Hematology, Biomedical Engineering, Biophysics, Biostatistics, Biotechnology, Health Administration, Health Planning and Management, Hospital Management, Nephrology, Urology, Endocrinology, Reproductive Biology, Radiotherapy, Oncology and Geriatric Medicine.

Para-clinical Medical Science:

It includes articles related to Pathology, Microbiology, Forensic Medicine and Toxicology, Community Medicine and Pharmacology.

Basic Medical Science:

It includes articles related to Anatomy, Physiology and Biochemistry.

Spiritual Health Science:

It includes articles related to Yoga, Meditation, Pranayam and Chakra-healing.

Each article in this issue provides an example of a concrete industrial application or a case study of the presented methodology to amplify the impact of the contribution. We are very thankful to everybody within

that community who supported the idea of creating a new Research with *IMJ Health*. We are certain that this issue will be followed by many others, reporting new developments in the Medical, Health and Pharmaceutical Research Science field. This issue would not have been possible without the great support of the Reviewer, Editorial Board members and also with our Advisory Board Members, and we would like to express our sincere thanks to all of them. We would also like to express our gratitude to the editorial staff of AD Publications, who supported us at every stage of the project. It is our hope that this fine collection of articles will be a valuable resource for *IMJ Health* readers and will stimulate further research into the vibrant area of Medical, Health and Pharmaceutical Research.



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She has awarded with WHO Fellowship for IEC at Bangkok. She has done management course from NIHFWS. She has published and present many research paper in India as well as abroad in the field of community medicine and medical education. She has developed Socio-economic Status Scale (Gaur's SES) and Spiritual Health Assessment Scale (SHAS). She is 1st author of a book entitled " Community Medicine: Practical Guide and Logbook.

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Research Area: Pediatric Surgery & Laparoscopy.

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Research Area: Pediatric Surgery & Laparoscopy.

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Knowledge and Attitude toward Treatment among Helicobacter pylori Patients in Khartoum State (2020_2021)

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Abstract—

Introduction: *Helicobacter pylori* (*H pylori*) are a ubiquitous organism that is present in about 50% of the global population. *H pylori* is the leading bacterial cause of both malignant and non-malignant gastritis and can lead to other serious complications. Sudan is one of the developing countries in which there is high prevalence without available and enough data about current situation. The last statistics had been done by ministry of health in Khartoum state in 2019 revealed that about 16242 persons were infected with *H pylori* from all ages and both sexes. Poor knowledge and wrong attitude toward treatment and route of transmission among *Helicobacter pylori* patients will increase the prevalence and its complications in our country. Since there are no previous studies about the knowledge and attitude towards treatment among *Helicobacter pylori* patients in Sudan, we conducted this study to assess the knowledge and attitude among Sudanese *Helicobacter pylori* patients towards treatment.

Methods: A descriptive cross sectional study was done with sample size equal to 284. The data was analyzed using SPSS. A score was developed to assess the overall level of knowledge that ranged from 0 to 23.

Results: Most of population had good level of knowledge 192 (77%). Also, a score from 0 to 3 was used to assess the level of attitude among the participants. The majority was found to have a positive attitude 127 (77%).

Keywords: *Helicobacter pylori*, Knowledge, Attitude, Patients.

I. INTRODUCTION

1.1 Background:

“*Helicobacter pylori* (*H pylori*) are a ubiquitous organism that is present in about 50% of the global population. Chronic infection with *H pylori* causes atrophic and even metaplastic changes in the stomach, and it has a known association with peptic ulcer diseases” [1]. The most common route of *H pylori* infection is either oral -to- oral or fecal -to- oral contact” [2], environment could be a route of transmission; in this contaminated food and water are likely vehicles [3]”. In general, patients infected with *H pylori* are asymptomatic, and no specific clinical signs and symptoms have been described. When signs and symptoms are present, they may include nausea, vomiting, abdominal pain, heartburn, diarrhea, hunger in the morning and halitosis” [4]. “Even though *H. pylori* colonization is usually asymptomatic, it leads to chronic active gastritis in most patients and is associated with a number of other gastritis diseases, including gastric and duodenal ulcer disease, distal gastric adenocarcinoma, primary gastric mucosal-associated lymphoid tissue (MALT) lymphoma, dyspepsia, atrophic gastritis, iron deficiency anemia, and idiopathic thrombocytopenic purpura. This is why *H. pylori* eradication is preferred for a long-term prevention of the above-mentioned complications and to prevent the recurrence” [5]. “The American college of gastroenterology (ACG) treatment guideline for first line and salvage therapies was last updated in 2017. Typically, *H pylori* treated with 2 to 3 antibiotics and a proton pump inhibitor (PPI). The 2017 guideline outlines evidence based. Frontline treatment strategies for providers in North America. These include clarithromycin triple therapy, bismuth quadruple therapy, concomitant therapy, sequential therapy, hybrid therapy, levofloxacin triple therapy and fluoroquinolone sequential therapy.

Clarithromycin triple therapy includes treatment with a PPI, clarithromycin and amoxicillin (metronidazole if the patient is allergic to amoxicillin). The guidelines notes that, when used in north America, the treatment should last for 14 days. The success of clarithromycin triple therapy depends on the rate of clarithromycin resistance.

Bismuth quadruple therapy is composed of a PPI or histamine 2 receptor antagonists, bismuth, metronidazole and tetracycline. The ACG guideline recommends giving this treatment for 10 to 14 days. Data from around the world suggest that bismuth quadruple therapy and clarithromycin triple therapy have similar efficacy, adherence and tolerability [6]. A study conducted by You Wu, Tun Su, et al to study the Chinese population awareness toward h pylori infection. They found that from all subjects who answered questions about h pylori infectivity, there is only 16% answered correctly to questions [7]. Another study, a literature review, was conducted by Lisa J.Driscoll, Heidie.Brown and et al. they used nine studies had been published between 1997 and 2014, eight of them were evaluating the risk people's perceptions toward h pylori infection, however, one of them studied the perception of all population. The studies suggest inconsistency between the population's perception and the established understanding of knowledge and attitude [8].

A survey was conducted by sikandar khan sherwani, syed hani, shahzad munir and et al. the study evaluated the level of awareness toward h pylori in general physicians in mega city- Karachi, Pakistan. The result revealed that 70% of physician had heard about h pylori before, whereas about 8% heard about it for the first time. Furthermore, 34% believed that h pylori can cause cancer. Majority of them believed that water is the main route of transmission and about 46% agreed on dyspepsia as the major sign. Moreover, there is about 54% suggested invasive tests as the diagnostic test, also it was found that 59% of physicians aware about first line of treatment and 33% were aware about the second line of antibiotics. Finally, there is about 80% suggested two weeks as the duration of treatment [9].

1.2 Problem statement:

H pylori is a worldwide disease, Meta- analysis adopted by zamani, et al, included publications from 2000 to 2017 found that an overall prevalence of 44.3% worldwide and rate range from 50.8% in developing countries and 34.7% in developed countries [10]. From this meta -analysis we can determine the high prevalence of h pylori in developing countries, and as Sudan is one of these developing countries in which there is high prevalence without available and enough data about current situation. The last statistics had been done by ministry of health in Khartoum state in 2019 revealed that about 16242 persons were infected with h pylori from all ages and both sexes. H pylori is the leading bacterial cause of both malignant and non-malignant gasrtoduodenal diseases [11-12]. H pylori infection can lead to serious complications, and it has high prevalence in our country. Moreover, we have high rate of ignorance in Sudan which might increase the prevalence of h pylori since have poor knowledge about the disease and how it transmits and the preventive measures would absolutely increase the disease in our nation.

1.3 Justification:

Due to lack of data about the population's knowledge and attitude toward h pylori in the whole world and certainly in Sudan, also due to dangerous complications of h pylori. We would like to conduct this research which might be helpful in decrease the prevalence of H. pylori in our country through increase the knowledge about the disease and the available choices of treatment and the ideal duration of treatment, furthermore we need to increase the population's awareness toward the prevention.

1.4 Objectives:

1.4.1 General objective:

To assess the knowledge of patients regarding h pylori infection and their attitude toward treatment.

1.4.2 Specific objectives:

- To assess the patient's knowledge about h pylori.
- To assess the patient's attitude toward the treatment.

II. METHODOLOGY

2.1 Study design: - descriptive cross sectional study.

2.1.1 Study population:

H pylori patients from both sexes above 18 years old who live in Khartoum state and volunteer to be part of this study.

2.2 Sampling:

- Non Probability sampling.
- Volunteer (self-selecting) sampling.

2.3 Sample size:

Sample size was obtained using the underlying formula:

$$N = z^2 * p(1-p) / e^2$$

N= sample size

Z=level of confidence which is 95%

Proportion of population who were aware about h.pylori infection p= as there is no previous data about it we considered it 50%.

e=margin of error which is 5%

$$n = (1.96)^2 * 0.5(1-0.5) / (0.05)^2$$

$$n = 284.16$$

$$n = 284$$

The sample size is equal to 284

2.4 Data collection:

A self –constructed Google form which designed in Arabic language to assess level of knowledge regarding h pylori and attitude of patients toward treatment. The Google form consists of 18 questions. Three of them are personal data, twelve questions are regarding knowledge and three questions are about attitude.

2.5 Data analysis:

Data was entered and analyzed using statistical package for the social sciences (SPSS) version 20, descriptive statistics (frequency and percentage) were used. A scoring system was developed to assess the overall level of knowledge and attitude.

III. RESULTS

The overall number of the respondents was 258, most of them in the age group 18 to 28 years 189 (74.1%). More than third were from Khartoum locality 98 (39.7%). Female were the predominant group 191 (75.2%).

The participants were asked if they were infected with h pylori and accordingly 219/254 (84.9%) confirmed that they had the infection.

TABLE 1
SOCIODEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS, KHARTOUM STATE 2021 (n ≈ 252)

Classification	Details	n	%	Total N
Age groups (years)	18-28	189	74.1	255
	29 - 39	44	17.3	
	40 - 50	14	5.5	
	more than 50	8	3.1	
Residence	Khartoum locality	98	39.7	247
	Bahri locality	39	15.8	
	Omdurman locality	46	18.6	
	Ombada locality	11	4.5	
	Jabal Awlia locality	18	7.3	
	Sharg Alnile locality	29	11.7	
Gender	Male	63	24.8	254
	Female	191	75.2	

A score was developed to assess the overall level of knowledge that ranged from 0 to 23. Those who scored from 0 to 11 were regarded as having poor knowledge; those above 11 were regarded as a good knowledge. Accordingly most of them had good level of knowledge 192 (77%).

TABLE 2
LEVEL OF KNOWLEDGE OF THE PARTICIPANTS TOWARD H.PYLORI, KHARTOUM STATE 2021 (n ≈254)

Classification	Details	n	%	Total N
Causative Agent	Bacteria	156	61.7	258
	Viruses	5	2.0	
	Fungi	5	2.0	
	I don't Know	87	34.4	
Is H.pylori a contagious disease?	Yes	102	40.3	253
	No	116	45.8	
	I don't know	35	13.8	
In your knowledge, is there a certain age for infection with H.pylori?	Yes	17	6.7	254
	No	207	81.5	
	I don't know	30	11.8	
In your knowledge, what are the modes of transmission of H.pylori?	Polluted water and food	141	55.5	254
	Saliva from the affected person	2	.8	
	All of the above	86	33.9	
	I don't know	25	9.8	
In your knowledge, what are the symptoms of H.pylori?	stomach pain	37	14.6	254
	nausea and vomiting	3	1.2	
	diarrhea	1	.4	
	burning sensation	14	5.5	
	weight loss	3	1.2	
	No symptoms	2	.8	
	All of the above	193	76.0	
In your knowledge, do H.pylori cause stomach ulcer?	yes	218	85.8	254
	No	9	3.5	
	I don't know	27	10.6	
In your knowledge, what are the complications of H.pylori?	Inflammation of the stomach lining	21	8.3	253
	Gastric ulcer	45	17.8	
	Stomach cancer	19	7.5	
	Anemia	2	0.8	
	Esophageal cancer	0	0.0	
	All of the above	130	51.4	
In your knowledge, what is the treatment of H.pylori?	Triple therapy	109	42.9	254
	Quadruple therapy	8	3.1	
	Surgery	4	1.6	
	Nutritional	24	9.4	
	traditional medicines	24	9.4	
	All of the above	65	25.6	
What does triple therapy contain?	pain killers	4	1.6	253
	Antibiotics and antacids	218	86.2	
	I don't know	31	12.3	
How long is the treatment needed?	1 to 2 weeks	118	46.6	253
	Month	68	26.9	
	I don't know	67	26.5	
In your knowledge, what are the ways to prevent H.pylori?	Clean food	7	2.8	254
	clean water	4	1.6	
	Both	229	90.2	
	I don't know	14	5.5	
Overall level of knowledge	Poor	56	22.6	248
	Good	192	77.4	

Also, a score from 0 to 3 was used to assess the level of attitude among the participants, 0 to 1 was regarded as negative attitude while 2 to 3 was regarded as a positive attitude, and as such the majority was found to have a positive attitude 127 (77%).

TABLE 3
ATTITUDE OF THE PARTICIPANTS TOWARD H. PYLORI, KHARTOUM STATE 2021 (n ≈224)

Classification	Details	n	%	Total N
Is taking H.pylori drugs necessary?	Yes	234	92.1	254
	No	20	7.9	
Do you think there is harm in taking these drugs?	Yes	126	49.8	253
	No	127	50.2	
If the answer is yes, is the harm greater than the benefit?	Yes	33	19.9	166
	No	133	80.1	
Overall level of attitude	Poor	38	23.0	
	Good	127	77.0	

IV. DISCUSSION

Our study estimated the prevalence in 255 participants from the seven Khartoum localities if they had/currently having H. pylori infection, and 85.8% perceived that they had it. A cross sectional study done in the United Arab Emirates which is known for its population influences from Africa, Asia and Europe, to determine the prevalence of H. pylori and the associated risk factors; showed 41% prevalence rate. The African residents presented the highest prevalence to H. pylori (18, 81.8%) compared to Asian (77, 46.7%) and Arab participants (50, 30.7%) [13]. This result is needs considerable attention to educate the general population especially the high risk ones in order raise the awareness and restrain the spread of the infection and/or managing it early and properly.

The majority of the participants were in age group of 18-28 years old, (74.1%) and decline markedly with age scoring the lowest in age group of more than 50 years old, 8/255 (3.1%). Darko et al. (Ghana) reported similarly that increased infection rate in younger population [14]. This is opposite to studies done in industrialized countries in Canada [15], United Arab Emirates [13] and in Oifiled community in china, in the later 2506 h. pylori positive out of 4796 participants showed an increasing trend of prevalence with age of 47.6%, 54.4% in age group of 19-30 and more than 50 years old respectively [16]. Beside the difference between developments in countries; our result could be owed to the frequent use of the younger population to the smart phones and accessing the social platforms more than the elders.

Khoder Gh. [13] reported females were infected more than males (53% vs 35%) which is comparable with our study (75.2% vs 24.8%) but differ with Wang [16] and worldwide prevalence of helicobacter pylori infection [10] in that gender has no significant role in prevalence.

The overall level of knowledge of the participants about H. pylori infection causes, pathology, way of transmission, risk factors and its complications was good about 77.4% which was they have a significant gap regarding its contagiousity and methods of treatment. Nearly half of them (45.8%) think H. pylori infection is not contagious and 13.8% of them don't know. Though 42.9% knows the triple therapy, only 25.6% knows all of treatment modalities and about 20% think that nutritional or traditional medicines alone is suitable for treatment. A literature review concluded that to adequately respond to current test-and-treat recommendations for treatment of H. pylori, general population education must be implemented, especially among at-risk populations [8]. Indeed a better preparation of the medical personnel in health care facilities to deliver the suitable knowledge and ensuring that infected/population at risk has a well cover of the H. pylori infection nature.

V. CONCLUSION

This study highlighted how common h pylori infection is, though it presented a small sample of population but was significant enough to give information about the knowledge and attitude of Sudanese patients who live in Khartoum state. This global health problem affects all age groups in the developing countries especially the younger population, in opposite to the developed countries with less prevalence rates and higher numbers in elderly people. In our study the younger people were more affected and this might be due to how younger people use the internet more than the elder. Therefore, a survey with interview method would be effective. In spite of the good level of knowledge among the study population [8], all of

them lived in Khartoum, the capital of Sudan which is the most civilized area. Thus further researches in rural areas and more in-depth assessment of knowledge, attitude and practice are surely needed.

LIMITATIONS

Face to face method to collect data was really hard to do due to sensible decline in the number of patients visiting hospitals due to corona epidemic. Thus we decided to conduct an online version of the questionnaire and decreasing the sample size to catch up the planned time frame.

ETHICAL CONSIDERATION

Approval had been taken from Khartoum state ministry of health research department Participation in the online survey, implied consent for the study.

CONFLICT OF INTEREST

All authors declared that there is no conflict.

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Evaluation of the severity of acute pancreatitis using BISAP, Ranson and APACHE II scores and comparing them with Modified Computed Tomography Severity Index score

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Abstract—

Aims and Objectives: Most of the studies published so far compare one or two out of the three clinical scores for assessing the severity of acute pancreatitis namely BISAP, Ranson and APACHE II scores with the Radiological Score of Modified Computed Tomography Severity Index. There is a paucity of studies that compare all three Clinical Scores with the Radiological Score of Modified Computed Tomography Severity Index. The aim of this study is to compare all three clinical scores with the radiological score mentioned above.

Materials and Methods: This is a cross sectional study which was conducted in the Department of Medicine and Department of Radiology, ABVIMS and Dr. Ram Manohar Lohia Hospital, New Delhi. A total of 40 patients were studied from November 2018 to March 2020. Admitted patients who fit into the New Diagnostic Criteria of the Revised Atlanta Classification for acute pancreatitis were taken into the study after getting the informed consent signed. CECT abdomen was done during the hospital stay and modified CTSI score was calculated. Patients with BISAP score ≥ 3 , Ranson score ≥ 3 , APACHE II score ≥ 8 and modified CTSI ≥ 4 (4-6: moderately severe, 8-10: severe; Note that in modified CTSI score, the final scores are always in even number) were classified as severe acute pancreatitis.

Results: The results of our study showed that the Modified CTSI score has the highest accuracy among the four scores in predicting severity of acute pancreatitis (AUC 0.969, P value <0.0001) which is statistically significant. Among the bedside scores namely APACHE II, Ranson and BISAP scores, the AUC was high in APACHE II score (AUC 0.750, P value 0.001) in comparison with Ranson score (AUC 0.688, P value <0.0001) and BISAP score (AUC 0.656, P value 0.0002).

Keywords: BISAP, Ranson, APACHE-II, Modified CTSI scores.

I. INTRODUCTION

The global incidence of acute pancreatitis is 33.74 per 100,000 population per year and the crude mortality rate is 1.16 per 100,000 population per year^[1] with the mortality rate of about 3% overall^[2], 10-30% in severe pancreatitis^[3].

There are several scoring systems to categorise the severity of acute pancreatitis. The patients with mild acute pancreatitis can be managed conservatively. Whereas patients with severe acute pancreatitis need intensive medical care and may require respiratory assistance, hemodialysis and inotropic support for hemodynamic stability. There are four widely used scoring systems based on lab investigations, clinical and radiological findings. They are BISAP score (Bedside Index of Severity in Acute Pancreatitis), APACHE II score (Acute Physiology And Chronic Health Evaluation), Ranson score and Modified CTSI Score (Computed Tomography Severity Index) which includes Balthazar CTSI score and Necrosis score based on CECT abdomen.

Image based scoring system like Modified CTSI not only depicts the degree of inflammation and hence the severity of pancreatitis to the greater extent of accuracy but also it helps in finding the cause of pancreatitis in some cases like Gallstone,

Pancreatic mass etc., Chatzicostas et al^[4] in their study showed that the image based scoring system CTSI is superior to the bedside scoring systems Ranson score, APACHE II score and APACHE III score in predicting severity of acute pancreatitis.

It is not feasible to do the imaging studies like CECT abdomen in every hospital set up. However it is feasible to do bedside clinical assessments and investigations like CBC, KFT, LFT, serum electrolytes, ABG, serum LDH, Chest X Ray, USG abdomen and assess the severity of acute pancreatitis using bedside scores such as BISAP score, Ranson score and APACHE II score. And so we can make further decisions based on the severity of the disease.

This study will use BISAP, Ranson and APACHE II scores to classify the severity of acute pancreatitis in a patient whose diagnosis is made by the New Diagnostic Criteria of 'The Revised Atlanta Classification'. And the Organ Failure which is characteristic of Severe Pancreatitis is determined by 'The Modified Marshall Scoring System'^[5]. The scores will be then compared with Modified CTSI (Computed Tomography Severity Index) score.

In 1992, The Atlanta Symposium was held, in which the acute pancreatitis is defined to be severe when there is organ failure, local complications such as pancreatic necrosis, abscess formation, and pseudocyst, and Ranson score ≥ 3 , APACHE II score ≥ 8 ^[6].

Severity of acute pancreatitis nowadays is assessed by Revised Atlanta Classification of acute pancreatitis. According to this classification, patient is said to have mild acute pancreatitis when there is no organ failure and local complications. In moderately severe acute pancreatitis patient has transient organ failure (lasting for less than 48 hours) and/or local complications (such as pancreatic necrosis, abscess and pseudocyst) and/or systemic complications. In severe acute pancreatitis, the patient has persistent organ failure (lasting more than 48 hours).

For proper definition of organ failure, modified Marshall scoring system is used. In this scoring system respiratory, cardiovascular and renal assessments are done. A score of ≥ 2 indicates organ failure^[5].

Organ System	Score 0	Score 1	Score 2	Score 3	Score 4
Respiratory(PO ₂ /FiO ₂)	>400	300-400	200-300	100-200	≤ 100
Renal(serum creatinine in mg/dl)	≤ 1.4	1.5-1.8	1.9-3.5	3.6-4.9	≥ 5
Cardiovascular(Systolic BP along with pH)	>90	<90, responds to fluid therapy	<90, not responds to fluid therapy	<90, pH<7.3	<90, pH<7.2

Some bedside clinical scoring systems to assess the severity of acute pancreatitis are BISAP score, Ranson score, APACHE II score. And radiological scoring system to assess the severity of acute pancreatitis are Balthazar CTSI score and modified CTSI score.

BISAP score is the simplest of the three above mentioned bedside clinical scoring systems. The required parameters to calculate BISAP score are Blood Urea Nitrogen (BUN), GCS assessment, assessment of markers of Systemic Inflammatory Response Syndrome (SIRS), age, pleural effusion. A score of ≥ 3 is said to be severe acute pancreatitis. SIRS is said to be present when ≥ 2 of the following features are present. Heart rate >90 /minute, temperature $>38^{\circ}\text{C}$ or $<36^{\circ}\text{C}$, respiratory rate >20 /minute, WBC >12000 or <4000 cells/mm³.

Ranson score requires assessment at two different time, one at the time of admission and another one at 48 hours after admission. In Ranson score, 11 parameters are assessed. Each parameter is given 1 point. A score of ≥ 3 is said to be severe acute pancreatitis. Thus it is a disadvantage that one has to wait for 48 hours to assess the severity of acute pancreatitis using Ranson score. The parameters assessed at the time of admission are age, WBC, serum LDH, AST, RBS. The parameters assessed at the 48 hours after the admission are drop in hematocrit $>10\%$, increase in BUN $> 5\text{mg/dl}$, Calcium $<8\text{mg/dl}$, PO₂ $<60\text{mmhg}$, Base Deficit $>4\text{mEq/L}$, Fluid loss $>6\text{L}$.

APACHE II score (Acute Physiology And Chronic Health Evaluation) score is used to assess the severity of disease in a patient who is admitted in ICU. It is calculated only once and is not recalculated during the hospital stay. The maximum score is 71. A score of ≥ 8 is said to be severe disease. It uses 12 acute physiological parameters, age and chronic health status of the patient^[7].

Based on Balthazar CTSI score & Modified CTSI score, the severity of acute pancreatitis was classified into mild, moderate and severe categories^[8].

Acute pancreatitis severity category using Balthazar CTSI severity score:

Mild Pancreatitis CTSI Score	:	0-3
Moderately severe Pancreatitis CTSI Score	:	4-6
Severe Pancreatitis CTSI Score	:	7-10

Acute pancreatitis severity category using the modified CTSI score:

Mild Pancreatitis Modified CTSI score	:	0-2
Moderately severe Pancreatitis Modified CTSI score	:	4-6
Severe Pancreatitis Modified CTSI score	:	8-10

In modified CTSI score, the final scores are always in even number.

II. MATERIALS AND METHODS

It is a Cross Sectional Study conducted in the Department of Medicine, ABVIMS, DR.RML Hospital, New Delhi from 1st November 2018 to 31st March 2020. A total of 40 admitted patients who fit into the New Diagnostic Criteria^[5] (according to the Revised Atlanta Classification for acute pancreatitis) i.e., the patient with any of the two: 1.Abdominal pain 2.Raised serum lipase or serum amylase level more than three times the normal values 3.Radiological evidence (USG or CT scan) were taken into the study after getting the informed consent. On the day of admission, the following details such as age, temperature, heart rate, respiratory rate, blood pressure, chronic health status evaluation of the patients were collected. And blood samples for CBC, KFT, LFT, serum electrolytes, serum LDH, and ABG were taken and Chest X Ray and USG abdomen were done. BISAP and APACHE II scores were calculated for all the patients. Patients were kept on NPO and managed with intravenous fluids and input/output monitoring was done for all the patients. After 48 hours of admission, the blood samples for CBC, KFT, serum electrolytes and ABG were taken. Ranson score was calculated after 48 hours of admission. CECT abdomen was done during the hospital stay and modified CTSI score was calculated. Patients with BISAP score ≥ 3 , Ranson score ≥ 3 , APACHE II score ≥ 8 and modified CTSI ≥ 4 (4-6: moderately severe, 8-10: severe; In modified CTSI score, the final scores are always in even number) were classified as severe acute pancreatitis.

III. ETHICAL CONSIDERATION

This study was carried out after the approval from the Institutional Ethics Committee.

IV. RESULTS

TABLE 1
DISTRIBUTION OF BISAP SCORE AND RANSON SCORE OF STUDY SUBJECTS.

BISAP Score	Frequency	Percentage	Ranson Score	Frequency	Percentage
<3	30	75.00%	<3	28	70.00%
≥ 3	10	25.00%	≥ 3	12	30.00%
Mean \pm SD	1.55 \pm 1.47		Mean \pm SD	1.9 \pm 1.66	
Median(IQR)	1(0-2.25)		Median(IQR)	1.5(1-3)	
Range	0-5		Range	0-7	

In our study, based on BISAP score, 75% (30 out of 40 patients) of the study population was categorised as mild acute pancreatitis and the remaining 25% (10 out of 40 patients) was categorised as severe acute pancreatitis. Based on Ranson Scoring, 70% (28 out of 40 patients) of the study population was categorised as mild acute pancreatitis and 30% (12 out of 40 patients) of the study population was categorised as severe acute pancreatitis.

TABLE 2
DISTRIBUTION OF APACHE-II SCORE OF STUDY SUBJECTS.

APACHE-II score	Frequency	Percentage
<8	19	47.50%
≥8	21	52.50%
Mean ± SD	8.93 ± 7.29	
Median(IQR)	8(2.75-15)	
Range	0-29	

According to APACHE II scoring system, 47.5% (19 out of 40 patients) of the study population were suffering from mild acute pancreatitis and 52.5% (21 out of 40 patients) of the study population were suffering from severe acute pancreatitis.

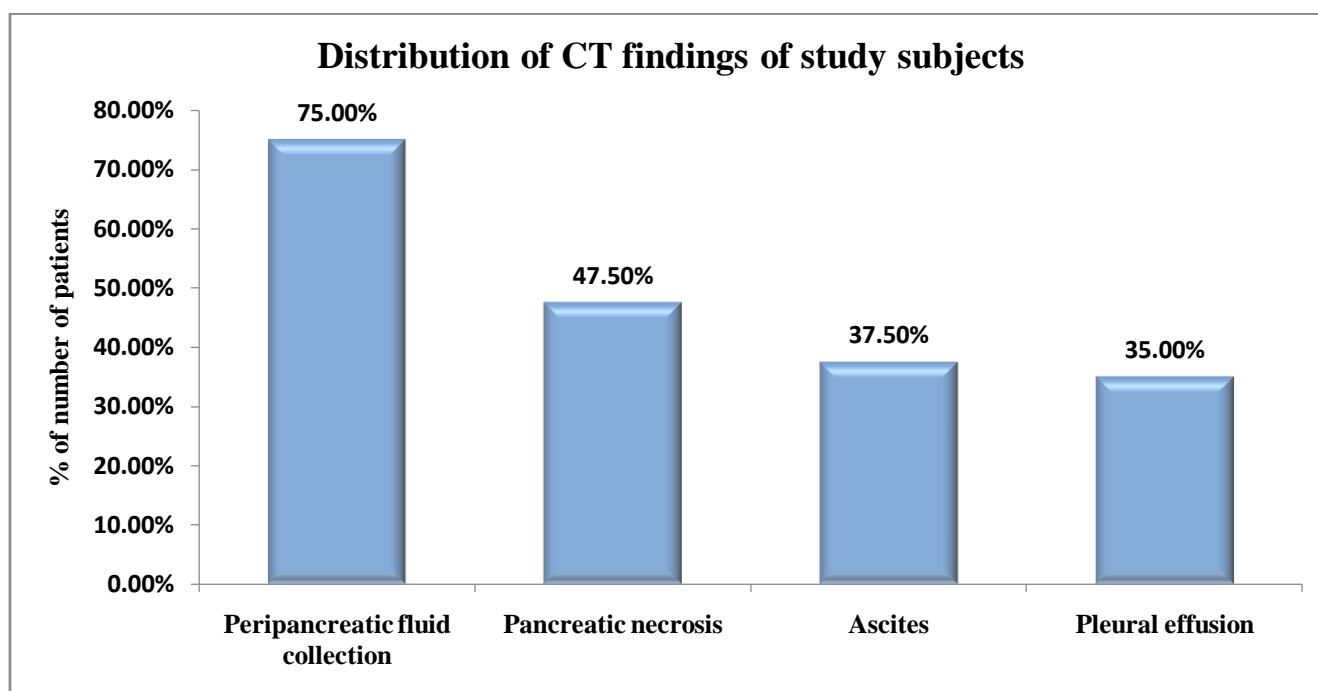


FIGURE 1: Distribution of CT findings of study subjects.

The percentage of Local and extra-pancreatic complications such as pancreatic necrosis, peripancreatic fluid collection, ascites and pleural effusion among the study population are 47.50% (19 out of 40 patients), 75% (30 out of 40 patients), 37.50% (15 out of 40 patients) and 35% (14 out of 40 patients) respectively.

TABLE 3
DISTRIBUTION OF MODIFIED CTSI SCORE OF STUDY SUBJECTS

Modified CTSI score	Category	Frequency	Percentage
0-2	Mild	10	25.00%
4-6	Moderately severe	17	42.50%
8-10	Severe	13	32.50%
Mean ± SD	5.4 ± 2.69		
Median(IQR)	6(3.5-8)		
Range	2-10		

Based on modified CTSI score, 25% (10 out of 40 patients) were classified as mild acute pancreatitis, 42.50% (17 out of 40 patients) were classified as moderately severe acute pancreatitis and 32.50% (13 out of 40 patients) were classified as severe acute pancreatitis.

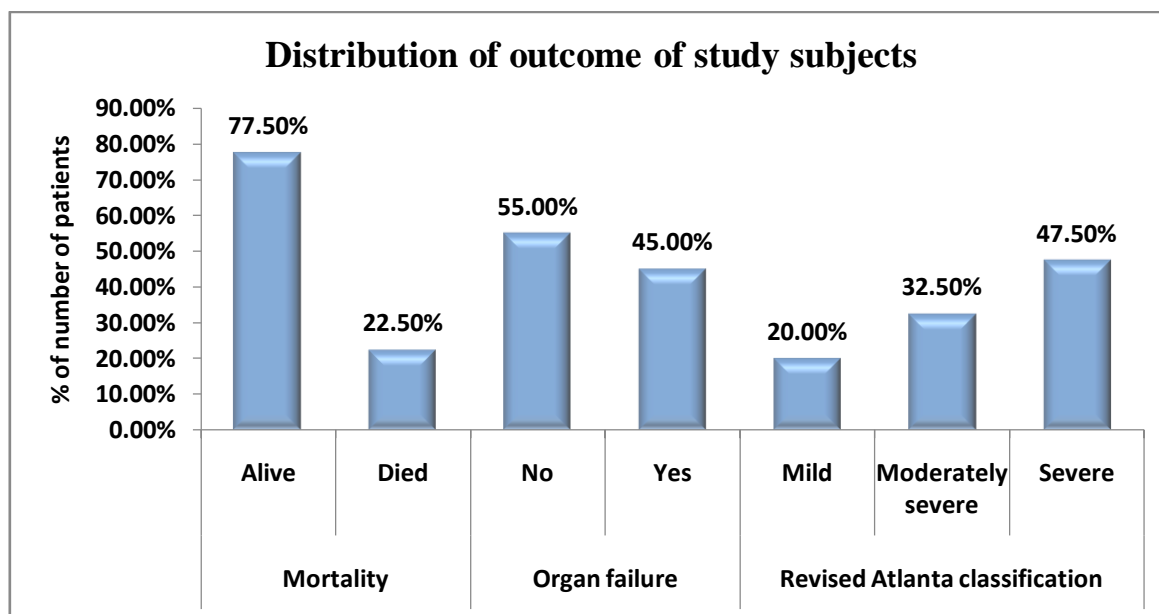


FIGURE 2: Distribution of outcome of study subjects.

Among the study population, 22.50% (9 out of 40 patients) did not survive, 45% (18 out of 40 patients) had organ failure. Based on Revised Atlanta Classification, 20% (8 out of 40 patients) were classified as mild acute pancreatitis, 32.50% (13 out of 40 patients) were classified as moderately severe acute pancreatitis and 47.50% (19 out of 40 patients) were classified as severe acute pancreatitis.

TABLE 4

SENSITIVITY, SPECIFICITY, POSITIVE PREDICTIVE VALUE, NEGATIVE PREDICTIVE VALUE OF BISAP SCORE, RANSON SCORE, APACHE-II SCORE AND MODIFIED CTSI SCORE FOR PREDICTING SEVERE ACUTE PANCREATITIS

Severe acute pancreatitis	BISAP score(≥ 3)	Ranson score(≥ 3)	APACHE-II score(≥ 8)	Modified CTSI score(≥ 4)
Area under the ROC curve (AUC)	0.656	0.688	0.75	0.969
Standard Error	0.0416	0.0435	0.0761	0.0217
95% Confidence Interval	0.490 - 0.799	0.522 - 0.824	0.588 - 0.873	0.859 - 0.999
P value	0.0002	<0.0001	0.001	<0.0001
Sensitivity(95% CI)	31.25%(16.1-50.0%)	37.5%(21.1-56.3%)	62.5%(43.7-78.9%)	93.75%(79.2 - 99.2%)
Specificity(95% CI)	100%(63.1 - 100.0%)	100%(63.1 - 100.0%)	87.5%(47.3 - 99.7%)	100%(63.1 - 100.0%)
PPV(95% CI)	100%(69.2 - 100.0%)	100%(73.5 - 100.0%)	95.2%(76.2 - 99.9%)	100%(88.4 - 100.0%)
NPV(95% CI)	26.7%(12.3 - 45.9%)	28.6%(13.2 - 48.7%)	36.8%(16.3 - 61.6%)	80%(44.4 - 97.5%)
Diagnostic accuracy	45.00%	50.00%	67.50%	95%

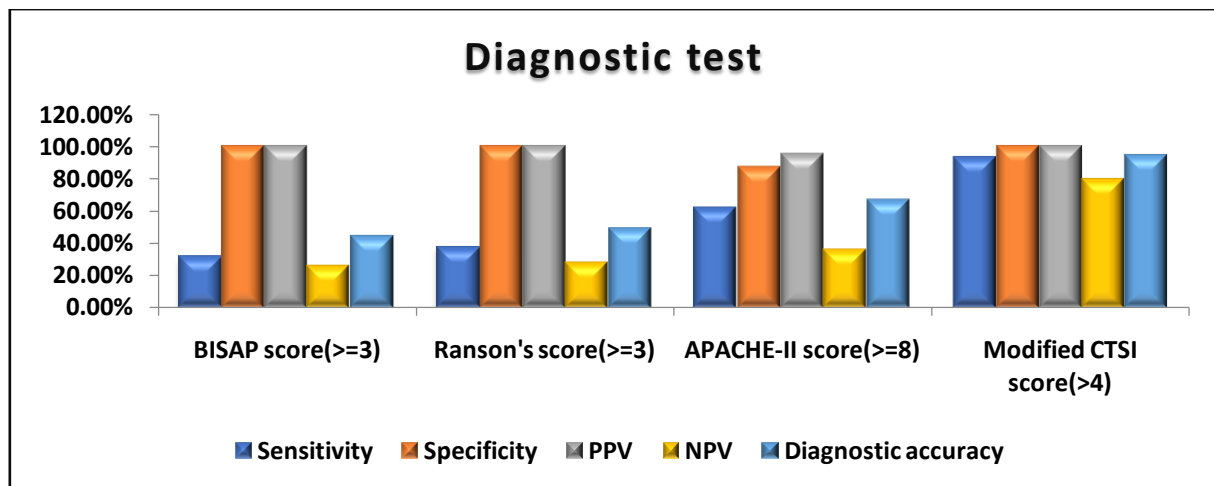


FIGURE 3: Sensitivity, specificity, positive predictive value, negative predictive value of BISAP score, Ranson score, APACHE-II score and modified CTSI score for predicting severe acute pancreatitis.

For predicting severity of acute pancreatitis, AUC was noted highest in modified CTSI score (0.969, P value <0.0001) followed by APACHE II score (0.750, P value 0.001), Ranson score (0.688, P value <0.0001) and BISAP score (0.656, P value 0.0002). The highest sensitivity for predicting severity of acute pancreatitis among the four scores was seen in modified CTSI (93.75%). Regarding the specificity for predicting severity of acute pancreatitis, modified CTSI, Ranson and BISAP has 100% specificity each. When the sensitivity for predicting severity of acute pancreatitis is compared among the scores namely APACHE II, BISAP, Ranson scores that can be obtained bedside, APACHE II score is highly sensitive (62.5%), followed by Ranson score (37.5%) and BISAP score (31.25%).

V. DISCUSSION

The distribution of local and extra-pancreatic complication noted in our study was 70% (30 out of 40 patients) peripancreatic fluid collection, 47.50% (19 out of 40 patients) pancreatic necrosis, 37.50% (15 out of 40 patients) ascites and 35% (14 out of 40 patients) pleural effusion.

The percentage of study population categorized into mild acute pancreatitis and severe acute pancreatitis are score 75% and 25% based on BISAP, 70% and 30% based on Ranson score, 47.50% and 52.50% based on APACHE II score respectively. Based on modified CTSI score 25% of the patients had mild acute pancreatitis and 42.50% of the patients had moderately severe acute pancreatitis, 32.50% of the patients had severe acute pancreatitis.

The mortality rate observed in our study was 22.50% (9 out of 40 patients). Of the 40 patients in our study population, 32.50% (13 out of 40 patients) belonged to moderately severe category and 47.50% (19 out of 40 patients) belonged to severe category, according to Revised Atlanta classification of acute pancreatitis. Among the study population, 45% (18 out of 40 patients) had organ failure.

For predicting severity of acute pancreatitis, AUC was noted highest in modified CTSI score (0.969, P value <0.0001) followed by APACHE II score (0.750, P value 0.001), Ranson score (0.688, P value <0.0001) and BISAP score (0.656, P value 0.0002). The highest sensitivity for predicting severity of acute pancreatitis among the four scores was seen in modified CTSI (93.75%). When the sensitivity for predicting severity of acute pancreatitis is compared among the scores namely APACHE II, BISAP, Ranson scores that can be obtained bedside, APACHE II score is highly sensitive (62.5%), followed by Ranson score (37.5%) and BISAP score (31.25%). Among the bedside scores namely Ranson, APACHE II and BISAP scores, the AUC was high in APACHE II score i.e., AUC of 0.750 (Table 4).

VI. CONCLUSION

1. The mortality rate in our study was 22.50%. According to Revised Atlanta classification of acute pancreatitis, 32.50% of the study population belonged to moderately severe category and 47.50% of the study population belonged to severe category in our study.

2. Modified CTSI score has the highest accuracy among the four scores in predicting severity of acute pancreatitis (AUC 0.969, P value <0.0001) which is statistically significant. Among the bedside scores namely APACHE II, Ranson and BISAP scores, the AUC was high in APACHE II score (AUC 0.750, P value 0.001).

ETHICAL APPROVAL

The Institutional Ethical Committee approval was taken before starting the study

Reference Number : F.No.TP(MD/MS)(118/2018)/IEC/PGIMER/RMLH

Date : 24th October 2018

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